ALL IN ONE DAY SEMINAR, CLINICAL EVIDENCE BASED PRACTICE OF CHIROPRACTIC: ETHICS & LAW, BASIC SCIENCE (NUTRITION), & ADVANCED CHIROPRACTIC ADJUSTIVE TECHNIQUE.

Presented by
Mark Cymerint D.C.

<u>California Approval Numbers:</u>
CA-C-24-05-04040 Advanced Adjustive Technique
CA-C-24-05-04039 Basic Science (Nutrition)
CA-C-24-05-04038 Ethics & Law

<u>Arizona Approval Number:</u>
AZCE23494
“All In One Day, Clinical Evidence Based Practice of Chiropractic: Principles of Practice, Ethics, and Chiropractic Adjustive Technique.”

NOTICE FROM: Board of Chiropractic Examiners 1/29/25

Governor Newsom Issues Executive Order Deferring Renewal Fees for Licensees Impacted by Los Angeles Fires

Eligible licensees can elect to postpone 2025 license renewal fees to 2026

On January 29, 2025, Governor Gavin Newsom issued Executive Order N-15-25, which postpones for one year the license renewal fees for Department of Consumer Affairs (DCA) licenses that expire between January 1, 2025 and June 30, 2025, and whose residential or business address is within the impacted zip codes:

- 90041
- 90049
- 90265
- 90272
- 90290
- 90402
- 91001
- 91024
- 91103
- 91104
- 91107
- 91367
- 93536

Upon renewal, licensees eligible for the fee postponement will renew with no payment due. This year's renewal fees will automatically be postponed to 2026.

Licensees with questions should contact the California Board of Chiropractic Examiners' Licensing Unit at (916) 263-5355 or Chiro.Licensing@dca.ca.gov.

BOARD REGULATIONS REGARDING PROMOTION OF SPECIFIC PRODUCTS AND/OR SERVICES

DISCLAIMER:

I may mention specific products or services that I personally use for the sole purpose of Continuing Education. However, I am *not* endorsing any manufacturers, distributors, or other sellers of chiropractic products or services. Everything I mention related to seminar content is solely for educational purposes and *not intended to sell or promote any specific vendors, brands, or companies.*

CONTACT ME!

Email:

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(949) 707-5785

Website:

TriadSeminars.com

Instagram:

@OrganiccsAbsolutelyPure

Facebook:

TriadSeminars

Podcast:

DrMCOrganiccsHealthPodcast

TO COMPLETE ONLINE DISTANCE LEARNING CE COURSES:

Step 1: Once you have completed the video seminar, go to TriadSeminars.com

Step 2: Select “CE Completion Forms” under the “Seminars” Section of the top menu.

Step 3: California DC’s, select:

California Chiropractors ONLY

California D.C.’s CE Completion Form

For both Seminar #1 and/or Seminar #2 – CLICK HERE

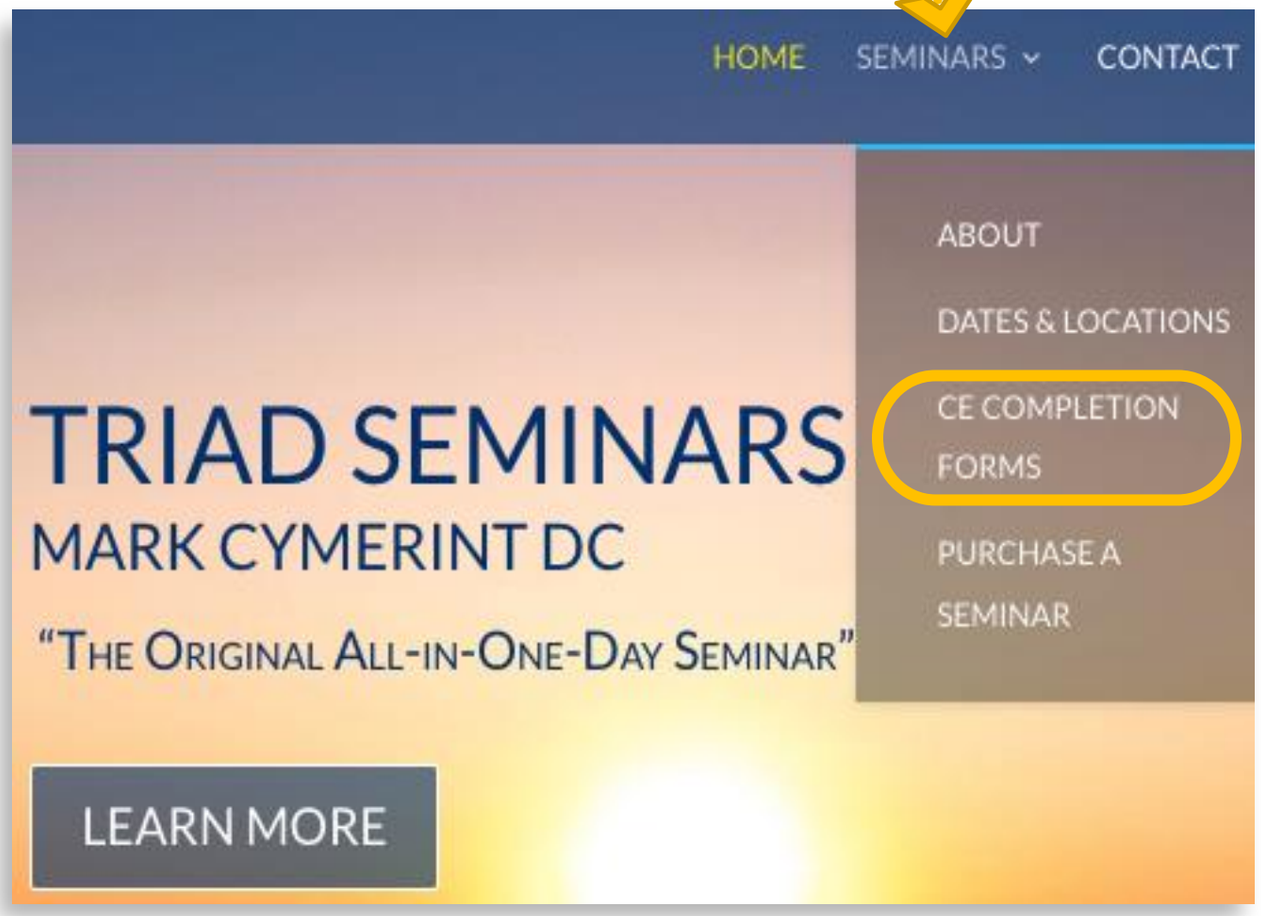
Non-California DC’s, select:

All Other States (WA, NV, HI, etc)

Seminar #1 Completion Form / Quiz – CLICK HERE

Seminar #2 Completion Form / Quiz – CLICK HERE

If you are licensed in another state, in addition to California, please select ”All Other States” Completion Form, then list each one of your License Numbers in the indicated sections.



Step 4: Complete the CE Completion Form that best applies to you and click “Submit”.

Once submitted, please allow 3 business days to receive a PDF copy of your CE Certificate via email.

NOTE: Please make sure to keep a copy of your CE Certificate, as we charge a duplication fee for any copies you might request from our records in the future.

1. BOUNDARIES ISSUES ETHICS & LAW

A. FOR HEALTHCARE PROVIDERS
   a) Documentation & Legal Forms
   b) SBCE Audits

B. STATE BOARD LAWS, RULES, AND REGULATIONS OVERVIEW
   a) Informed Consent, Current Notices from SBCE
   b) State Board Laws, Rules & Regulations Overview
   c) Common Violations of the SBCE

C. PANDEMIC PROTOCOLS FOR HEALTHCARE PROVIDERS USING CDC, STATE, AND FEDERAL GUIDELINES

NEW CALIFORNIA BOARD OF CHIROPRACTIC EXAMINERS

MAILING ADDRESS

DEPARTMENT OF CONSUMER AFFAIRS

BOARD OF CHIROPRACTIC EXAMINERS

1625 North Market Blvd. | Suite N-327

SACRAMENTO, CA 95834

Telephone: (916) 263-5355

Fax: (916) 327-0039

CA Relay Service TT/TDD: (800) 735-2929

Consumer Complaint Hotline: (866) 543-1311

chiro.info@dca.ca.gov

AFTER TODAYS SEMINAR, A CERTIFICATE OF ATTENDANCE WILL BE PASSED OUT TO EACH ATTENDEE, YOU WILL NEED TO KEEP THIS FOR YOUR RECORDS FOR 5 YEARS IN CASE OF AUDIT. IF LOST A DUPLICATE COPY IS AVAILABLE FOR $35.

BOARD OF CHIROPRACTIC EXAMINERS' UPDATED FEE SCHEDULE

BOARD of CHIROPRACTIC EXAMINERS
STATE OF CALIFORNIA

BUSINESS, CONSUMER SERVICES AND HOUSING AGENCY • GAVIN NEWSOM, GOVERNOR
DEPARTMENT OF CONSUMER AFFAIRS • CALIFORNIA BOARD OF CHIROPRACTIC EXAMINERS
1625 N. Market Blvd., Suite N-327, Sacramento, CA 95834
P (916) 263-5355 | Toll-Free (866) 543-1311 | F (916) 327-0039 | www.chiro.ca.gov

BOARD OF CHIROPRACTIC EXAMINERS' UPDATED FEE SCHEDULE

EFFECTIVE JANUARY 1, 2023

Senate Bill 1434 (Roth, Chapter 623, Statutes of 2022) amends Business and Professions Code section 1006.5 and implements the following fee schedule for the Board of Chiropractic Examiners beginning January 1, 2023:

Fee Description	Fee Amount
Doctor of Chiropractic License Application	$345
Doctor of Chiropractic Reciprocal License Application	$283
Doctor of Chiropractic Initial License	$137
Doctor of Chiropractic License Renewal (Annual)	$336
Doctor of Chiropractic License Restoration	$672
Doctor of Chiropractic Duplicate/Replacement License	$71
Satellite Certificate Application	$69
Satellite Certificate Renewal (Annual)	$50
Satellite Certificate Duplicate/Replacement	$71
Chiropractic Corporation Certificate Application	$171
Chiropractic Corporation Certificate Renewal (Annual)	$62
Chiropractic Corporation Special Report Filing	$98
Chiropractic Corporation Certificate Duplicate/Replacement	$70
Petition for Early Termination of Probation or Reduction of Penalty	$3,195
Petition for Reinstatement of a Revoked or Surrendered License	$4,185

Fee Description	Fee Amount
License Certification	$83
Continuing Education Provider Application	$291
Continuing Education Provider Renewal (Biennial)	$118
Continuing Education Course Application	$116 per hour of instruction
Preceptor	$72
Referral Service Application	$279

NEW CHIROPRACTIC BOARD UPDATES 2025

Expedited Licensure for Honorably Discharged Members of the United States Armed Forces

Each Department of Consumer Affairs (DCA) licensing program is required to expedite the licensure/registration process for an applicant that served as an active duty member of the Armed Forces of the United States and was honorably discharged.

For an applicant's license/registration to be expedited, the applicant must:

Supply evidence that they were an active duty member of the Armed Forces of the United States who was honorably discharged.

Expedited Licensure and Initial Fee Waiver for Spouses or Domestic Partners of Active-Duty Military Personnel

Each DCA licensing board and bureau is required to expedite the licensure/registration process for spouses and domestic partners of those on active duty in the Armed Forces. Beginning July 1, 2022, each board and bureau must also waive the initial application and license fee for military spouses. Please note: Not all fees collected by DCA boards and bureaus or required for licensure are waived for military spouses. Please contact the specific board or bureau for more information about which fees may be waived.

For an applicant's license/registration to be expedited, the applicant must:

Supply evidence that they are married to, or in a domestic partnership or other legal union with, an active duty member of the Armed Forces of the United States who is assigned to a duty station in California under official orders, and;

Hold a current license/registration in another state, district or territory of the United States in the profession or vocation for which the applicant is seeking a license/registration.

THE DEFINITION OF MEDICAL NECESSITY IN HEALTH INSURANCE

DATE & JOURNAL: VERYWELL HEALTH, 24 SEPT. 2023

Understanding medical necessity in health insurance is essential for navigating coverage and avoiding unexpected expenses. Health insurance plans only cover services deemed medically necessary, which are treatments necessary for maintaining or restoring health or treating diagnosed medical conditions. Determination of medical necessity relies on criteria set by insurers, such as Medicare's National Coverage Determinations, with non-compliance potentially resulting in claim denial.

Additionally, medical marijuana, despite being legal in many states, remains uncovered due to federal classification. Patients should be aware of prior authorization requirements and referral protocols to ensure compliance with their plan's rules. If claims are denied, patients have the right to appeal, with the Affordable Care Act guaranteeing external review in certain cases.

Bihari, Michael, MD. "The Definition of Medical Necessity in Health Insurance." Verywell Health, 24 Sept. 2023, www.verywellhealth.com/medical-necessity-in-health-insurance-1738685.

FEES A CHIROPRACTOR CAN CHARGE FOR A COPY OF RECORDS

As of my knowledge cutoff in September 2021, California law allows healthcare providers, including chiropractors, to charge a reasonable fee for copying and providing medical records to patients or authorized individuals. However, the specific fee structure may vary, and it's essential to refer to the most up-to-date information and consult the relevant statues to determine the exact fees permissible in California. In general, California law stipulates that the fees charged for copying medical records should reflect the actual costs incurred by the healthcare provider. These costs may include expenses for supplies, labor, postage, and preparation of an explanation or summary if requested by the patient. Additionally, there may be restrictions on the maximum fees that can be charged for certain types of records, such as X-rays.

It is in my clinical opinion, that the (Click Here) California Code, Evidence Code - EVID § 1563 you are allowed to charge $15 plus the actual cost of review of file, or retrieval and/or return of records that are off site plus mileage. So, an itemized statement should reflect all of the above charges and fees.

To obtain accurate and current information on the fees charged by chiropractors in California for copying records, it's recommended to consult the California statutes, such as the California Health and Safety Code or the California Business and Professions Code. Alternatively, you can contact the California Board of Chiropractic Examiners or the California Chiropractic Association for guidance on the specific fee structure allowed in the state.

SAMPLE ITEMIZED STATEMENT – COPY OF RECORDS

Orange County Chiropractic Center
1111 Pacific Coast Hwy
Newport Beach, CA 90210
(949) 888-8888

1. California Evidence Code EVID 1563 Copy of Records Fee $15.00
2. Doctor additional review of patient chart $30.00
3. Off site retrieval and return of records, staff hourly rate + mileage (9 miles)
   30 minutes total each way ($25.00 each way)

$50.00

TOTAL: $95.00

Payment due at time of copying. All copying can be done at the doctor's office/ doctor does not have copying equipment to make copies.

Beginning July 1, 2024, boards and bureaus under the Department of Consumer Affairs (DCA) must expedite licensure application processing for service members currently enrolled in the U.S. Department of Defense SkillBridge Program.

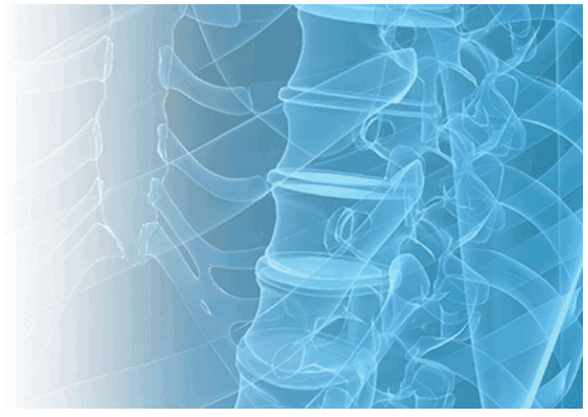
Service members seeking licensure in California who qualify must provide documentation of enrollment, such as an official letter from the commanding officer. Failure to provide proper documentation could result in application processing delays. Applicants must still meet all board or bureau licensing requirements. For questions or assistance regarding licensing requirements, please contact the Board's Licensing Unit at Chiro.Licensing@dca.ca.gov.

For more information on licensing resources available to service members, visit: www.dca.ca.gov/military.

Sincerely,

Board of Chiropractic Examiners
1625 N. Market Blvd., Suite N-327
Sacramento, CA 95834
Email: Chiro.Info@dca.ca.gov
Phone: (916) 263-5355
Web: https://www.chiro.ca.gov/

BOARD of CHIROPRACTIC EXAMINERS
STATE OF CALIFORNIA



Effective January 1, 2024, under Business and Professions Code section 27.5, licensees may notify the Board of Chiropractic Examiners (Board) of a name and/or gender change and request confidentiality of the previous name or gender information, when meeting certain specified requirements.
When the licensee submits the documentation identified below demonstrating that their name or gender changed, the Board will recognize the licensee's name or gender change and update the individual's license and the online publicly viewable licensing information by replacing references to the former name or gender with references to the current name or gender. Licensees eligible for a name change and request for confidentiality include:

•Individuals participating in the Secretary of State's Safe at Home program who confidentially change their name in a court proceeding based on concerns related to domestic violence, stalking, sexual assault, or human trafficking, pursuant to Code of Civil Procedure section 1277(b).
•Individuals who change their name in a court proceeding to conform to their gender identity, pursuant to Code of Civil Procedure section 1277.5.
•Individuals who obtain a court order to change their name in connection with a court proceeding to change their gender or sex identifier, pursuant to article 7 of chapter 11 of part 1 of division 102 of the Health and Safety Code. Such court orders are typically issued in connection with a change to a birth certificate or marriage license and certificate.

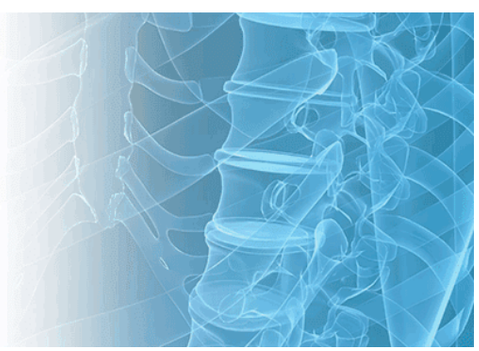
Once a licensee's name or gender is updated, the former name or gender will not be published online, except that if a public search of the online license verification system is performed using the licensee's former name, a statement will appear in connection with the search directing the public to contact the Board for more information about the licensee.

Enforcement records that reference the licensee's former name or gender will not be posted online. Instead, a statement will appear noting that the licensee was previously subject to enforcement action and directs the public to contact the Board for more information about the enforcement action. Enforcement records that are not posted online may be subject to disclosure pursuant to the California Public Records Act. To request a name or gender change under the new law, or to learn more, visit the Name and Gender Change Notification and Request for Confidentiality webpage.

Questions may be directed to the Board's Licensing Unit at (916) 263-5355 and Chiro.Licensing@dca.ca.gov.

Thank you,
Board of Chiropractic Examiners

BOARD of CHIROPRACTIC EXAMINERS
STATE OF CALIFORNIA



CALIFORNIA SCHOOL VACCINE EXEMPTION FORM

https://eziz.org/assets/docs/shotsforschool/IMM-1363.pdf

https://www.policiesforpeople.com/

DOCUMENTATION & LEGAL FORMS

California Code of Regulations: Title 16; Division 4; Article 2; Section 318.

Chiropractic Patient Records/Accountable Billings

Current through April 8, 2022.

(a) Chiropractic Patient Records. Each licensed chiropractor is required to maintain all active and inactive chiropractic patient records for five years from the date of the doctor's last treatment of the patient unless state or federal laws require a longer period of retention. Active chiropractic records are all chiropractic records of patients treated within the last 12 months. Chiropractic patient records shall be classified as inactive when there has elapsed a period of more than 12 months since the date of the last patient treatment.

All chiropractic patient records shall be available to any representative of the Board upon presentation of patient's written consent or a valid legal order. Active chiropractic patient records shall be immediately available to any representative of the Board at the chiropractic office where the patient has been or is being treated. Inactive chiropractic patient records shall be available upon ten days notice to any representative of the Board. The location of said inactive records shall be reported immediately upon request.

Active and inactive chiropractic patient records must include all of the following:

1. Patient's full name, date of birth, and social security number (if available);
2. Patient gender, height and weight. An estimated height and weight is acceptable where the physical condition of the patient prevents actual measurement;
3. Patient history, complaint, diagnosis/analysis, and treatment must be signed by the primary treating doctor. Thereafter, any treatment rendered by any other doctor must be signed or initialed by said doctor;
4. Signature of patient;
5. Date of each and every patient visit;
6. All chiropractic X-rays, or evidence of the transfer of said X-rays;
7. Signed written informed consent as specified in Section 319.1.

(b) Accountable Billings. Each licensed chiropractor is required to ensure accurate billing of his or her chiropractic services whether or not such chiropractor is an employee of any business entity, whether corporate or individual, and whether or not billing for such services is accomplished by an individual or business entity other than the licensee. In the event an error occurs which results in an overbilling, the licensee must promptly make reimbursement of the overbilling whether or not the licensee is in any way compensated for such reimbursement by his employer, agent or any other individual or business entity responsible for such error. Failure by the licensee, within 30 days after discovery or notification of an error which resulted in an overbilling, to make full reimbursement constitutes unprofessional conduct.

D.C. Treatment Plan

PATIENT INFORMATION

Name:
Address:

DOB:
Gender:

Treatment Plan

□ Initial Care (M,W,F)
□ Continuing Care (M,W,F)

Date of First Treatment in this office for condition:
Anticipated Release Date:

Subjective Complaint:

Lost Days of Work:
Days of Work Restriction:
Mechanism of Injury:
□ Acute Trauma
□ Worsening Of Prior Condition
□ Repetitive Motion
□ Gradual Onset
□ Chronic
□ Other
Date of Onset:
Date of Initial Evaluation:

Treatment Goals: (Functional Improvement and Expected outcome ie-able to sit 30 minutes with pain decreased by 50%)

Treatment Type:

□ Posture Correction/ Neuro
□ Chiropractic Adjustments
□ Cold Laser Therapy
□ Infrared Pain Mgt.
□ Functional Movement Taping
□ Electric Massage/ Muscle Stim.
□ Acute Trauma
□ Flexion/ Distraction- Disc

Treatment Schedule: (Frequency and time frame)

Anticipated No. of Treatments Until next evaluation:

Objective Findings

Inspection:

Palpation:

Summary of Clinical Findings (Ortho. and neuro. tests used to support diagnosis) :

Home Care:

□ Stretching
□ Exercise
□ Hot/Cold
□ Dietary instructions
□ Referral: _____

□ Supplements
  □ Turmeric
  □ Minerals
  □ Collagen
  □ Amino Acids
  □ Greens

Diagnosis:

Complicating Factors:

□ Surgery
□ Diabetes
  □ Medications
□ Obesity
□ Inflammation

□ Other: _____
□ Other Diagnostic Testing Suggested:
_____
_____

Doctor Signature: _____ Date: _____

Patient Signature: _____ Date: _____

Waiver of X-Rays & Diagnostic Testing

This is to acknowledge that:_____D.C. has recommended that X-RAYS and other diagnostic testing be taken so that a complete study and analysis may be made of my present problem (or illness).

I do not feel at this time that it is necessary to warrant the use of X-rays and/or diagnostic testing for personal and/or financial reasons. Therefore, you are hereby authorized and directed to treat my present problem (or illness) to the best of your ability without making a complete study and analysis of my present problem (or illness).

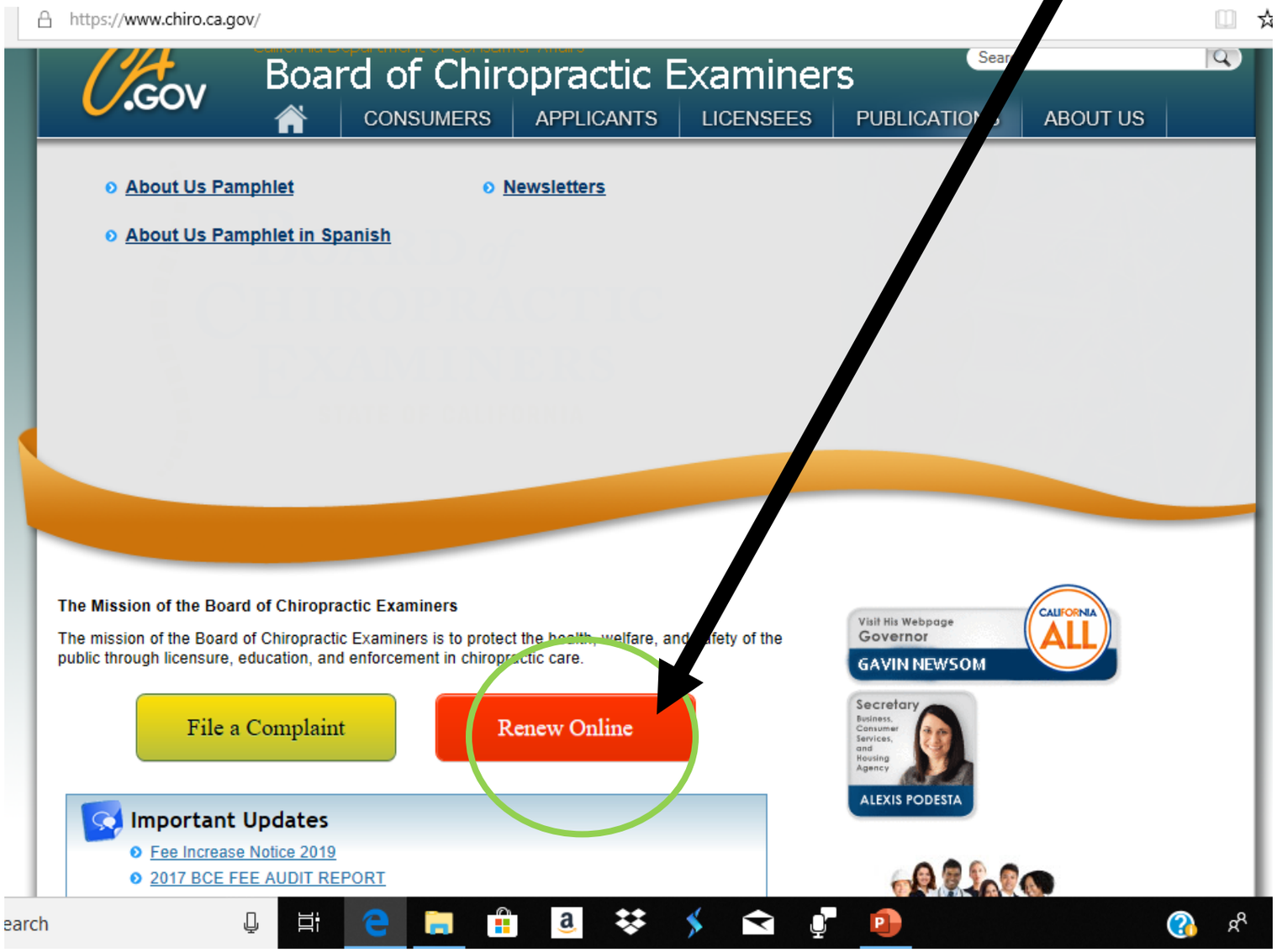
Should any untoward effects or any further illness or injury develop, directly or indirectly, as a result of such treatment, I shall assume full responsibility. In consideration of your treating me at my request without benefit of a complete study and analysis. I do hereby release you from all causes of action, damages, and liabilities arising by reason of said treatment, whether heretofore or hereafter occurring, and whether now known or unknown by the parties here to.

SIGNED: _____

Print Name: _____

Date: _____

LICENSE RENEWAL NOW AVAILABLE ONLINE!!!



- You can now renew your license online with a credit card & no transaction fee!!!
- Go to the Board website at: chiro.ca.gov
- Click on the red renew online!

You may NOT complete the renewal payment process online if your license status is:

- *Inactive*
- *Revoked*
- *Surrendered*
- *Delinquent beyond sixty days (Forfeiture)*
- *Cancelled*
- *License on hold*

HOW WILL I KNOW IF I'VE BEEN SELECTED FOR AN AUDIT?

The Board will send a letter to your address of record informing you that you have been selected for an audit. The letter will include instructions on what action is required from you and what CE certificate documents are being requested.

Make sure your address of record is current!

IF I AM SELECTED FOR AN AUDIT, WHAT DO I NEED TO SUBMIT TO THE BOARD AND WHEN?

You will need to submit copies of all documents verifying completion of the CE requirements. The Board will provide a deadline for submitting documents, and may allow two to three weeks to comply with an audit.

Only submit CE documents if you have been selected for audit; do not submit them with your renewal.

WHAT IF I DON’T HAVE ALL MY DOCUMENTS?

The Board cannot count unverified courses or activities toward meeting the CE requirements. You must provide documentation to verify completion of hours for a successful audit. If you need copies of your CE documents, contact the CE course provider.

Licensees and CE providers are required to maintain CE records for four (4) years.

WHAT IF I NEED AN EXTENSION TO GATHER ALL MY CE DOCUMENTS?

Please contact the Board at (916) 263-5355.

An extension may be granted for gathering
CE documents, *but NOT for completing CE requirements.*

WHAT HAPPENS AFTER I SUBMIT MY DOCUMENTS?

A Board staff member will evaluate the materials you submitted and determine whether you met the CE requirements or not. A deficient audit will be sent to the Enforcement unit for further review. Instructions or actions taken by the Enforcement unit will be communicated to licensees via mail.

REMINDER! TOTAL HOURS REQUIRED OF EACH LICENSURE PERIOD:

- **<u>24 total hours:</u>**
  - Two (2) hours in Ethics and Law
  - Four (4) hours must be completed in any one subject category, or in a combination of the following subject categories:
    History taking and physical examination procedures, OR chiropractic adjustive techniques,
    OR chiropractic manipulation techniques, OR ethical billing and coding.
  - Eighteen (18) hours may be taken in any of the categories listed in California Code of Regulations section 361, including the mandatory categories above.
  - A maximum of twelve (12) CE hours may be completed through distance learning.

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STATE LAWS: RULES & REGULATIONS

STATE LAWS: RULES & REGULATIONS

§319.1. Informed Consent.

(a) A licensed doctor of chiropractic shall verbally and in writing inform each patient of the material risks of proposed care. "Material" shall be defined as a procedure inherently involving known risk of serious bodily harm. The chiropractor shall obtain the patient's written informed consent prior to initiating clinical care. The signed written consent shall become part of the patient's record.

(b) A violation of this section constitutes unprofessional conduct and may subject the licensee to disciplinary action.

INFORMED CONSENT TO CHIROPRACTIC CARE

Cymerint Chiropractic Center
25283 Cabot Rd, Ste 109
Laguna Hills, CA 92653
(959) 707-5785
markcymerintdc@gmail.com
markcymerintdc.com

This Informed Consent to Chiropractic Care form is intended to provide you with the necessary information regarding chiropractic care, its potential risks, material risks, and benefits, and to obtain your consent to proceed with treatment. Please read the entire document carefully and ask any questions you may have before signing.

I, _____ (Patient Name), hereby request and consent to chiropractic care and related diagnostic procedures performed by Mark Cymerint, D.C., at Cymerint Chiropractic Center.

1. Chiropractic Care

Chiropractic care involves the diagnosis and treatment of musculoskeletal disorders, primarily through manual manipulation, instrument posture balancing of the spine and other joints. We may employ the use of cold laser, to reduce inflammation and or pain. The goal of chiropractic care is to restore joint mobility, reduce pain, and promote overall health and well-being.

1. Potential Risks and Side Effects

As with any form of health care, there are potential risks and side effects associated with chiropractic care. Although the majority of patients do not experience any significant complications, it is important to be aware of the potential risks, which may include:

- Mild discomfort or soreness at the site of the adjustment, typically lasting no more than a few days.
- Dizziness, lightheadedness, or fainting, which may occur immediately following an adjustment.
- Bruising, swelling, or tenderness at the site of the adjustment or surrounding soft tissues.
- Fractures, dislocations, or other injuries to the bones or joints, which are rare but can occur in cases of severe osteoporosis, and pre-existing joint instability.
- Nerve irritation or injury, which can cause numbness, tingling, weakness, or pain in the arms, legs, or other areas.
- In extremely rare cases, complications such as stroke or spinal cord injury can occur in a chiropractic office but may or may not have a cause and effect as a result of chiropractic adjustments.

In addition to the above-listed risks and side effects, the following list includes other possible adverse situations and extenuating circumstances that may be associated with chiropractic care:

- Aggravation of pre-existing conditions, such as herniated discs or spinal stenosis.
- Temporary increase in pain or discomfort.
- Soft tissue injuries, such as sprains, strains, or muscle tears.
- Incomplete or slow recovery from treatment.
- Inflammation or irritation of the joints or surrounding tissues.
- Loss of sensation or changes in sensation.
- Headaches or migraines.
- Fatigue or tiredness.
- Insomnia or difficulty sleeping.
- Digestive issues, such as constipation or diarrhea.
- Difficulty with balance or coordination.
- Exacerbation of pre-existing neurological conditions.
- Development or worsening of allergies or asthma.
- Worsening of anxiety or depression symptoms.
- Mood swings or irritability.
- Tinnitus or ringing in the ears.
- Changes in vision or eye function.
- Jaw pain or temporomandibular joint (TMJ) dysfunction.
- Changes in menstrual cycle or menstrual pain.
- Difficulties with pregnancy or breastfeeding.
- Adverse reactions to supplements or recommendations provided by the chiropractor.
- Blood clots or deep vein thrombosis (DVT).
- Allergic reactions to chiropractic equipment or materials.
- Adverse interactions between chiropractic care and medications.
- Inability to participate in certain activities or exercises due to treatment.
- Injuries sustained while traveling to or from the clinic.
- Slips, trips, or falls within the clinic.
- Injuries from chiropractic equipment malfunction.

Miscommunication or misunderstanding regarding treatment recommendations.

- Emotional distress or upset related to treatment.
- Financial difficulties or stress due to the cost of care.
- Inadequate response to treatment, resulting in the need for additional care.
- Increased risk of injury during chiropractic adjustment for patients with certain medical conditions.
- Changes in blood pressure.
- Skin irritation or rash.
- Development of scar tissue.
- Complications related to undiagnosed medical conditions.
- Injuries related to at-home exercises or self-care recommendations.
- Adverse effects on the immune system.
- Exacerbation of autoimmune disorders.
- Effects on blood sugar levels.
- Hormonal imbalances.
- Interference with other ongoing treatments or therapies.
- Injuries related to the use of therapeutic devices, such as electrical muscle stimulation or ultrasound, flection distraction motorized table, cold laser devices.
- Complications related to the use of spinal traction devices.
- Injuries sustained during the performance of chiropractic adjustments on infants or young children.
- Any other unforeseen or unpredictable adverse events or circumstances that may occur during or after chiropractic care.
- Alternatives to Chiropractic Care

Alternatives to chiropractic care may include, but are not limited to, the following:

- Medical care, including medications for pain relief or muscle relaxation.
- Physical therapy or exercise programs to improve strength, flexibility, and overall function.
- Acupuncture, massage therapy, or other complementary and alternative therapies.
- No treatment, accepting the risk that symptoms may worsen or not improve.
- Acknowledgment and Consent

I have read this document in its entirety and understand the potential risks and benefits associated with chiropractic care. I have had the opportunity to ask questions and have received satisfactory answers. I understand that there are no guarantees regarding the outcome of chiropractic care, and I acknowledge that results may vary among individuals.
I understand that I am free to withdraw my consent and discontinue treatment at any time. By signing below, I voluntarily consent to receive chiropractic care at Cymerint Chiropractic Center.

Patient Name (please print) _____ Patient Signature _____

Date _____

Parent/Guardian Name (if applicable) _____

Parent/Guardian Signature (if applicable) _____

Date _____

DC Name and Signature _____ Date _____

FRAUD ALERT: Notice from the Board of Chiropractic Examiners

Dear Licensees,
The Board of Chiropractic Examiners (BCE) has learned of a scam aimed at licensees of the Board. In the scheme, an individual falsely identifying themselves as an employee of the Board has phoned licensees asking them to confirm personally identifying information. During the phone call, the scammers attempt to gain the information by telling the licensee someone is attempting to use their license to practice or their license has been suspended and they're under investigation.

If you receive a call from an individual claiming to be an employee of the Board and they attempt to gather personal and financial information, please consider the following:

- Simply take down the caller's information (including name, title, phone number, and email address), let them know you will follow-up directly with the Board and end the call.

- You may also consider ending the call without explanation if it appears suspicious or to be a scam.

- Contact BCE. Contact information for all DCA boards and bureaus can be found at: www.dca.ca.gov/about_us/entities.shtml

- If you don't know who to contact at the Board, call the Department of Consumer Affairs' Consumer Information Center at (800) 952-5210 for assistance and to get directed to the appropriate entity.

- NEVER disclose any personal information, i.e. social security numbers, date of births, or credit/debit card numbers, without first taking steps to verify that the person requesting the information has a legitimate need for it.

- Be aware that BCE or Department of Consumer Affairs staff will never ask for credit/debit card information over the phone.

Thank you,
Board of Chiropractic Examiners | October 27th, 2021

INSURANCE FLASH UPDATES!

The greatest piece of advice I can give you is to pay attention to your EOB's. There is much to be learned by doing so. Most importantly, learn what DOESN'T pay per carrier and per payor class. Look for those denials. A little time spent doing so will make you more money, so pay attention.

TIP # 1 : If you are not in on the Triwest game, you need to be. Our veterans are everywhere and they need your care. The VA (Triwest) is the best paying carrier in California, so if you are not a provider, you are missing the boat.

Tip # 2 : United Healthcare is actually reading your diagnosis now! If you think that sounds funny, they are the first one to do so. Other than workers comp and personal injury carriers, health insurance carriers cannot and do not actually read your diagnosis and they do not correlate the diagnosis and the procedure codes you bill. For example, you can put a "Toe Pain" diagnosis *ONLY* on your claim and bill a full spine adjustment (98942) and it will pay every time. EXCEPT NOW UNITED HEALTHCARE IS PAYING ATTENTION! They are now denying manipulations if the improper number of spinal region diagnosis are not on your claims. So be sure to code three or 5 regions (M99.01, M99.02, M99.03, M99.04, M99.05 for example) in your diagnosis if billing 98941 or 98942 now with UHC.

Tip # 3 : Aetna is becoming increasing difficult with any physical therapy coding that requires a -59 for the code. If possible, your safest codes are 97110 and 97530 as they do not require this -59 modifier. These codes can also be billed in multiple units as well. And always remember, Aetna allows 4 units or procedures per day.

These tips may not apply to all of you, but the tip about paying attention does. You are running a business, so do all you can to do so profitably.

Lis Donaldson, ACM

949-598-9999

INFO@ACMBILLINGSERVICE.COM for questions

ACM Insurance Updates Dec. 2024

MEDICARE UPDATES

Great news for 2025! The Medicare deductible has been updated to $257.00, a small bump from last year's $240.00. As always, Medicare covers spinal manipulation for subluxations, keeping your care focused and effective. New year, new fee schedule—here's to a healthy 2025!

BlueShield

BLUE SHIELD UPDATE

Heads Up, Providers! Blue Shield keeps things running smoothly by asking providers to attest every 90 days. It's a quick way to confirm your practice details and ensure patients can find you easily. Timely updates mean no hiccups with claims and happy patients!

Don't have a Blue Shield account yet? No problem! Visit their provider portal to sign up—it's simple. Just gather your NPI and practice details, follow the prompts, and you'll be set up in no time. Let's keep everything running like clockwork!

United Healthcare

UHC UPDATE

Some UnitedHealthcare Senior Plans now require prior authorization for certain services. A quick eligibility check before care keeps everything running smoothly and ensures hassle-free claims. Let's keep things seamless for you and your patients!

FEDERAL CORPORATE TRANSPARENCY ACT FOR CHIROPRACTORS

IMPORTANT REMINDER FOR CHIROPRACTIC PRACTICE OWNERS: Beneficial Ownership Information Federal Reporting Requirement

Failure to Report Has Significant Penalties, Including Fines of Up to $500 Per Day!

What You Need to Know

1.The Corporate Transparency Act (CTA), effective January 1, 2024, requires many U.S. businesses – including the vast majority of chiropractic practices – to disclose information regarding owners.
2. Failure to comply can result in significant penalties, including fines (up to $500 per day) and imprisonment of up to two year.
3. Entities that existed before January 1, 2024, must **file** their Beneficial Ownership Information (BOI) report no later than December 31, 2024.
4.The Report can be filed online free of charge, and in most cases can be completed without the assistance of a legal or tax professional.

Help & Resources from the Financial Crimes Enforcement Network
•**FinCEN Small Business Resources**
•**FinCEN BOI Toolkit**
•**Small Entity Compliance Guide**
•**BOI FAQs** (Updated October 3, 2024)
•**FinCEN YouTube Channel**

BCE NEWS: ADVERTISING CHIROPRACTIC SERVICES: https://www.chiro.ca.gov/about_us/spring_2018.pdf

- Whether you choose to adverse your services online or through other avenues such as TV, radio, or signage it is crucial that understand and comply with the Board of Chiropractic Examiners (Board's) rules and regulations to prevent deceptive advertising.

- Advertising must be in compliance with the California Codes or Regulations (CCR) Title 16, section 311, and the Business and Professions code section 651.

  - CCR section 311 reads: *Constructive educational publicity is encouraged, but the use by any licensee of advertising which contains misstatements, falsehoods, misrepresentations, distorted, sensational or fabulous statements, or which is intended or has a tendency to deceive the public or impose upon credulous or ignorant persons, constitutes grounds for the imposition of any of the following disciplinary penalties*

THE CHIROPRACTIC INITIATIVE ACT OF CALIFORNIA

HTTPS://WWW.CHIRO.CA.GOV/LAWS_REGS/INITIATIVE_ACT.SHTML

§ 15. Noncompliance with and violations of act

Any person who shall practice or attempt to practice chiropractic, or any person who shall buy, sell or fraudulently obtain a license to practice chiropractic, whether recorded or not, or who shall use the title "chiropractor" or "D.C." or any word or title to induce, or tending to induce belief that he or she is engaged in the practice or chiropractic, without first complying with the provisions of this act; "(or any licensee under this act who uses the word "doctor" or the prefix "Dr." without the word "chiropractor," or "D.C." immediately following his or her name) or the use of the letters "M.D." or the words "doctor of medicine," or the term "surgeon," or the term "physician," or the word "osteopath," or the letters "D.O." or any other letters, prefixes or suffixes, the use of which would indicate that he or she was practicing a profession for which he or she held no license from the State of California, or any person who shall violate any of the provisions of this act, shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not less than one hundred dollars ($100) and not more than seven hundred fifty dollars ($750), or by imprisonment in the county jail for not more than six months, or by both fine and imprisonment.

(Initiative Measure, Stats. 1923, p. xcii, § 15. Amended by Stats. 1988, c. 1094, § 2.)

PRIVACY RISKS OF SOCIAL MEDIA

- Social media platforms present strong marketing opportunities for healthcare professionals.
- However, many licensees find themselves inadvertently breaching patient confidentiality and violating the Health Insurance Portability and Accountability Act (HIPAA).
- HIPAA requires all individually identifiable health information to be protected.
- Common Violations Include:
  - Uploading photos of patients on social media networking sites, which can possibly lead to penalties and tighter regulatory scrutiny.
  - Unintentionally disclosing information that allows other community member to guess the patient's identity.
  - Responding to negative reviews on rating sites such as Yelp. Healthcare providers may inadvertently share personal details about a patient’s treatment or reveal diagnostics as they try to rebut criticism.

HEALTHCARE PROFESSIONALS SHOULD CONSIDER A RISK MANAGEMENT APPROACH:

- Regularly monitor social media conversations for possible HIPAA violations.
- Be sure to do your own research before using social medial to communicate with your patients. Familiarize yourself with HIPAA confidentiality requirements and understand how it protects the patient privacy. Specific guidelines found via HIPAA website: https://www.hhs.gov/hipaa/for-professionals/index.html
- Develop a social media policy in which your practice identifies how social media will be used, who in your office is permitted to use your practice's social media accounts, and what types of information may be shared.
- Regularly train your employees on HIPAA compliances and social media policy.
- Have a system in place to help you not only prevent, but also react to a HIPAA noncompliance issues and implement corrective action immediately.

STATE LAWS: RULES & REGULATIONS

§302. Practice of Chiropractic.

(a) Scope of Practice.

(1) A duly licensed chiropractor may manipulate and adjust the spinal column and other joints of the human body and in the process thereof a chiropractor may manipulate the muscle and connective tissue related thereto.

(2) As part of a course of chiropractic treatment, a duly licensed chiropractor may use all necessary mechanical, hygienic, and sanitary measures incident to the care of the body, including, but not limited to, air, cold, diet, exercise, heat, light, massage, physical culture, rest, ultrasound, water, and physical therapy techniques in the course of chiropractic manipulations and/or adjustments.

(3) Other than as explicitly set forth in section 10(b) of the Act, a duly licensed chiropractor may treat any condition, disease, or injury in any patient, including a pregnant woman, and may diagnose, so long as such treatment or diagnosis is done in a manner consistent with chiropractic methods and techniques and so long as such methods and treatment do not constitute the practice of medicine by exceeding the legal scope of chiropractic practice as set forth in this section.

(4) A chiropractic license issued in the State of California does not authorize the holder thereof:

(A) to practice surgery or to sever or penetrate tissues of human beings, including, but not limited to severing the umbilical cord;

STATE LAWS: RULES & REGULATIONS

(5) A duly licensed chiropractor may employ the use of vitamins, food supplements, foods for special dietary use, or proprietary medicines, if the above substances are also included in section 4057 of the Business and Professions Code, so long as such substances are not included in materia medica as defined in section 13 of the Business and Professions Code.

The use of such substances by a licensed chiropractor in the treatment of illness or injury must be within the scope of the practice of chiropractic as defined in section 7 of the Act.

(6) Except as specifically provided in section 302(a)(4), a duly licensed chiropractor may make use of X-ray and thermography equipment for the purposes of diagnosis but not for the purposes of treatment. A duly licensed chiropractor may make use of diagnostic ultrasound equipment for the purposes of neuromuscular skeletal diagnosis.

(7) A duly licensed chiropractor may only practice or attempt to practice or hold himself or herself out as practicing a system of chiropractic. A duly licensed chiropractor may also advertise the use of the modalities authorized by this section as a part of a course of chiropractic treatment, but is not required to use all of the diagnostic and treatment modalities set forth in this section. A chiropractor may not hold himself or herself out as being licensed as anything other than a chiropractor or as holding any other healing arts license or as practicing physical therapy or use the term "physical therapy" in advertising unless he or she holds another such license.

STATE LAWS: RULES & REGULATIONS

§ 302.5. Use of Laser

(a) A duly licensed chiropractor and any person under their direct or indirect supervision, as defined in section 312, shall:

(1) Not use any laser in the practice of chiropractic which has not been properly approved or cleared by the United States Food and Drug Administration (FDA).

(2) Not market or advertise the use of a laser or use a laser for purposes other than treatment consistent with section 302 and the product's FDA approval or clearance.

(3) Follow the manufacturer's specified guidelines for the safe use of laser.

(4) Comply with all state and federal laws governing the use of lasers in clinical settings.

(b) Nothing in this section shall be construed to authorize the use of a laser by a chiropractor outside of the chiropractic scope of practice. This includes, but is not limited to, laser ablation or surgical procedures, and laser treatment of allergies.

(c) Any violation of this section may constitute unprofessional conduct and the licensee shall be subject to discipline by the Board.

STATE LAWS: RULES & REGULATIONS

§303. Filing of Addresses.

Each person holding a license to practice chiropractic in the State of California under any and all laws administered by the board shall file his proper and current place of practice address of his principal office and, where appropriate, each and every sub-office, with the board at its office in Sacramento and shall immediately notify the board at its said office of any and all changes of place of practice address, giving both his old and his new address within 30 days of change.

STATE LAWS: RULES & REGULATIONS

§306.3. Investigators; Authority to Inspect Premises.

The board or its designee may inspect the physical premises of any chiropractic office during regular business hours.

§307. Refund of Fees.

The board is not authorized or permitted by law to return any portion of the license application fee of a qualified applicant.

§308. Display of License.

(a) Each person holding a license shall display a current active license in a conspicuous place in the licensee's principal office or primary place of practice.

(b) Any licensed Doctor of Chiropractic with more than one place of practice shall obtain from the Board a Satellite Office Certificate for each additional place of practice. Said certificate must be renewed annually.

(c) A licensed Doctor of Chiropractic must display in a conspicuous place a current active Satellite Office Certificate at the office for which it was issued.

No licensed Doctor of Chiropractic shall display any chiropractic license, certificate or registration, which is not currently active and valid.

STATE LAWS: RULES & REGULATIONS

§316. Responsibility for Conduct on Premises.

(a) Every licensee is responsible for the conduct of employees or other persons subject to his supervision in his place of practice, and shall insure that all such conduct in his place of practice conforms to the law and to the regulations herein.

(b) Where a chiropractic license is used in connection with any premises, structure or facility, no sexual acts or erotic behavior involving patients, patrons or customers, including, but not necessarily limited to, sexual stimulation, masturbation or prostitution, shall be permitted on said premises, structure or facility.

(c) The commission of any act of sexual abuse, sexual misconduct, or sexual relations by a licensee with a patient, client, customer or employee is unprofessional conduct and cause for disciplinary action. This conduct is substantially related to the qualifications, functions, or duties of a chiropractic license.

This section shall not apply to sexual contact between a licensed chiropractor and his or her spouse or person in an equivalent domestic relationship when that chiropractor provides professional treatment.

STATE LAWS:
RULES AND REGULATIONS

For Arizona Licensees Only

California DC's can skip slides marked AZ

STATE LAWS: RULES & REGULATIONS | AZ

§32-922.01. RECIPROCITY; REQUIREMENTS

A. A. The board shall issue a license to practice chiropractic under this section to an applicant who meets the following requirements:
   1. Holds a current license to practice chiropractic issued after examination by a licensing board in another state or country in which, in the opinion of the board, the licensing requirements are at least substantially equivalent to those of this state and the other state or country grants similar reciprocal privileges to chiropractors licensed in this state.
   2. Receives a grade of at least seventy-five per cent on the Arizona jurisprudence examination.
   3. Pays the original license fee of one hundred dollars.

B. The applicant shall pay the application fee prescribed by section §32-921 and present proof satisfactory to the board that:
   1. A license issued by any other state has not been sanctioned for any cause that is a basis of a sanction imposed by the board pursuant to this chapter, except for failure to pay fees.
   2. The applicant has not previously failed to pass the examination in this state.
   3. The applicant has been engaged in the practice of chiropractic continuously for not less than three of the five years immediately preceding the application

STATE LAWS: RULES & REGULATIONS | AZ

§32-923. CHANGE OF ADDRESS; ANNUAL RENEWAL FEE; FAILURE TO RENEW; WAIVERS; DEFINITION

A. Every person who is licensed pursuant to this chapter shall notify the board in writing of any change in residence or office address and telephone number within thirty days after that change. The board shall impose a penalty of fifty dollars on a licensee who does not notify the board as required by this subsection.

B. Except as provided in section §32-4301, every person who is licensed to practice chiropractic in this state shall annually make a renewal application to the board before January 1 after original issuance of a license and shall pay a renewal license fee of not more than two hundred twenty-five dollars as established by the board. The renewal application shall be made on a form and in a manner prescribed by the board. At least thirty days before the renewal application and renewal fee are due, the board shall send by first class mail a renewal application and notice requiring license renewal and payment of the renewal fee.

STATE LAWS: RULES & REGULATIONS | AZ

§32-924. GROUNDS FOR DISCIPLINARY ACTION; HEARING; CIVIL PENALTY; DEFINITION

A. A. The following are grounds for disciplinary action, regardless of where they occur:

1. Employment of fraud or deception in securing a license.

2. Practicing chiropractic under a false or assumed name.

3. Impersonating another practitioner.

4. Habitual use of alcohol, narcotics or stimulants to the extent of incapacitating the licensee for the performance of professional duties.

5. Unprofessional or dishonorable conduct of a character likely to deceive or defraud the public or tending to discredit the profession.

6. Conviction of a misdemeanor involving moral turpitude or of a felony.

7. Gross malpractice, repeated malpractice or any malpractice resulting in the death of a patient.

8. Representing that a manifestly incurable condition can be permanently cured, or that a curable condition can be cured within a stated time, if this is not true.

9. Offering, undertaking or agreeing to cure or treat a condition by a secret means, method, device or instrumentality.

10. Refusing to divulge to the board on demand the means, method, device or instrumentality used in the treatment of a condition.

11. Giving or receiving or aiding or abetting the giving or receiving of rebates, either directly or indirectly.

12. Acting or assuming to act as a member of the board if this is not true.

13. Advertising in a false, deceptive or misleading manner.

14. Having had a license refused, revoked or suspended by any other state or country, unless it can be shown that the action was not taken for reasons that relate to the ability to safely and skillfully practice chiropractic or to any act of unprofessional conduct.

15. Any conduct or practice contrary to recognized standards in chiropractic or any conduct or practice that constitutes a danger to the health, welfare or safety of the patient or the public or any conduct, practice or condition that impairs the ability of the licensee to safely and skillfully practice chiropractic.

16. Violating or attempting to violate, directly or indirectly, or assisting in or abetting the violation of or conspiring to violate any of the provisions of this chapter or any board order.

STATE LAWS: RULES & REGULATIONS | AZ

§32-925. PRACTICE OF CHIROPRACTIC; LIMITATIONS

A. A doctor of chiropractic is a portal of entry health care provider who engages in the practice of health care that includes:

1. The diagnosis and correction of subluxations, functional vertebral or articular dysarthrosis or neuromuscular skeletal disorders for restoring and maintaining health.

2. Physical and clinical examinations, diagnostic x-rays and clinical diagnostic laboratory procedures that are limited to nasal swabs, oral swabs, sputum collection, urine collection, finger pricks or venipuncture in order to determine the propriety of a regimen of chiropractic care or to form a basis for referring patients to other licensed health care professionals, or both.

3. Treatment by:

a) Physical medicine modalities, therapeutic procedures and adjustment of the spine or bodily articulations.

b) Procedures related to the correction of subluxations and neuromuscular skeletal disorders.

c) Prescription of orthopedic supports.

d) Acupuncture.

B. A doctor of chiropractic who is licensed under this chapter shall not prescribe or administer medicine or drugs, perform surgery or practice obstetrics.

STATE LAWS: RULES & REGULATIONS | AZ

§32-931. CONTINUING EDUCATION; REQUIREMENTS

A. The board by rule may require each licensee to complete up to twelve hours of continuing education each calendar year as a condition of licensure renewal.

B. Continuing education shall cover topics listed in section §32-922, subsection B and section §32-922.02 and shall be taught by a faculty member of a college or university that is accredited by or has status with the council on chiropractic education or is accredited by an accrediting agency recognized by the United States department of education or the council on postsecondary accreditation.

1. Beginning July 1, 2012, the board shall adopt rules to prescribe the continuing education requirements.

C. Compliance with this section shall be documented at the times and in the manner as prescribed by the board in rule. 20 of 121.

D. Failure of a person holding a license to practice chiropractic to comply with this section without adequate cause being shown is grounds for probation or suspension of the person's license.

STATE LAWS: RULES & REGULATIONS | AZ

R4-7-501. DISPLAY OF LICENSES

- A licensee shall, at all times, display the license issued to the licensee by the Board in a conspicuous place at all locations where the licensee engages in the practice of chiropractic, including mobile practices. A licensee shall, upon request of any person, produce for inspection the license renewal certificate for the current calendar year.

TOP 10 BOARD DISCIPLINARY ACTIONS

INSURANCE FRAUD:

- Double billing
- Billing for service not rendered
- Up coding
- Excessive treatment

UNLICENSED PRACTICE:

- Practicing after license expired
- Failing to promptly renew
- Aiding and abetting unlicensed individuals

SEXUAL MISCONDUCT:

- Erotic behavior
- Inappropriate touching
- Sexual contact or having sexual relations with a patient, client, customer, or employee

EXCESSIVE TREATMENT:

- Treatment beyond what is reasonable/necessary or within the standard of care
- Failure to document necessity (conduct a thorough exam, diagnose the condition, implement a treatment plan, and conduct follow-up exams to assess progress)

VIOLATION(S) INVOLVING DRUGS/ALCOHOL:

- DUI
- Possession or use of any illicit drugs
- Practicing while impaired
- Prescription medication abuse

TOP 10 BOARD DISCIPLINARY ACTIONS

CONVICTION OF A CRIME(S):

- Theft
- DUI
- Domestic violence
- Vandalism

FALSE AND/OR MISLEADING ADVERTISING:

- Sensational claims
- Fraud/misrepresentation
- No "D.C." after chiropractor's name

BEYOND SCOPE OF PRACTICE:

- Performing surgical procedures
- Claiming to treat/cure cancer
- Furnishing/prescribing controlled substances

NEGLIGENCE/INCOMPETENCE:

- Physical harm to patient
- Failure to exercise appropriate standard of care

FAILURE TO RELEASE PATIENT RECORDS WITHIN 15 DAYS OF REQUEST:

- Includes requests from patient, patient attorney, patient representative, insurance company, or BCE representatives

PAYMENT FOR REFERRALS:

- Discounts
- Free services
- Cash/gift cards

BOARD of CHIROPRACTIC EXAMINERS
STATE OF CALIFORNIA

ACM Insurance Billing Updates June 2024

Change Healthcare

On February 21, 2024 it was reported that there had been a cyber attack on Change Healthcare's. It is estimated that this breach impacts 1 in 3 Americans, potentially the PHI of more than 100 Million people!

This breach has impacted providers far & wide. The AMA conducted a survey and the results show:

- 33% of physician practices have seen claims payments suspended
- 32% have not been able to submit claims
- 39% have not been able to obtain ERA's and 22%. Insurances impacted with ERA's:
  - Kaiser
  - Meritain
  - Aetna
  - Medicare
  - BC of CA
  - BS of CA
  - Many others

If a provider has been set up with direct deposit, most payments are being received now. MANY insurances are still not issuing ERA's though & it's up to the providers to "hunt down" these remittances via other websites (Availity, Noridian Medicare Portal…) (Noridian Medicare has not mailed any paper remittances out since February!)

This issue is expected to continue for quite some time. Hang in there!!

3rd Party Personal Injury Claims

Often times provider shy away from taking on Personal Injury Cases when there is no attorney to represent/honor a lien. These 3rd Party Claims are risky – the patient treats, makes no payment throughout the course of treatment and then eventually settles with the 3rd Party. Upon settlement the patient is "supposed to" pay the provider but often they skip out & the provider is out of luck! We are finding many insurances now are willing to pay the provider directly upon settlement. It's definitely worth a phone call to the insurance adjuster to see if a claim would be handled this way.

FORMER CHIROPRACTOR SENTENCED TO NEARLY SIX YEARS IN FEDERAL PRISON FOR FRAUDULENTLY SUBMITTING $2.2 MILLION IN BILLINGS TO HEALTH INSURERS

Article Link

THURSDAY, APRIL 21, 2022: SANTA ANA, California – A former Orange County chiropractor was sentenced today to 70 months in federal prison for stealing from health insurers by fraudulently causing the submission of $2.2 million in billings for chiropractic services never provided, medical diagnoses never given, office visits that never occurred, and medical devices that were falsely prescribed.

Susan H. Poon, 57, of Dana Point, was sentenced by United States District Judge David O. Carter, who ordered her to pay $1,379,622 in restitution to her victims. At the conclusion of a five-day trial in June 2021, a federal jury found Poon guilty of five counts of health care fraud, three counts of making false statements relating to health care matters, and one count of aggravated identity theft.

From January 2015 to April 2018, Poon, whose office was in Rancho Santa Margarita, schemed to defraud health insurance companies by submitting false reimbursement claims for services that were never performed. Poon also submitted fraudulent prescriptions containing medical diagnoses of individuals that she had never met, including toddlers and children, which led a medical device manufacturer to submit false claims for reimbursement to one health insurer. The patients that Poon claimed to have met with and treated were dependents – such as the spouses and children – of Costco Wholesale Corp. and United Parcel Service Inc. employees. Poon unlawfully took and used the dependent's personal identifying information (PII) in her reimbursement requests and prescriptions. Poon obtained the PII by attending health fairs at various UPS warehouses and Costco locations and soliciting such information from employees.

"[Poon's] scheme consisted of interdependent moving parts," prosecutors wrote in a sentencing memorandum. "She lied about visits with, diagnoses of, and treatments given to actual people and their children. She sent fraudulent Durable Medical Equipment (DME) prescriptions – predicated on visits with these patients that never happened – to a DME manufacturer. And she fabricated medical documentation containing the personal identifying information of these 'ghost' patients to mislead an auditor." In total, Poon billed and caused to be billed approximately $2.2 million through her scheme. Poon's chiropractic license was revoked in July 2019, according to the California Department of Consumer Affairs.
The following agencies investigated this matter: Amtrak – Office of the Inspector General, California Department of Insurance, U.S. Department of Labor – Employee Benefits Security Administration, U.S. Department of Labor Office of the Inspector General, the FBI, and Office of Personnel Management – Office of the Inspector General.

Assistant United States Attorneys Daniel S. Lim and Daniel H. Ahn of the Santa Ana Branch Office prosecuted this case.

1. BOUNDARIES ISSUES ETHICS & LAW

A. FOR HEALTHCARE PROVIDERS
   a) Documentation & Legal Forms
   b) SBCE Audits

B. STATE BOARD LAWS, RULES, AND REGULATIONS OVERVIEW
   a) Informed Consent, Current Notices from SBCE
   b) State Board Laws, Rules & Regulations
   c) Common Violations of the SBCE

C. PANDEMIC PROTOCOLS FOR HEALTHCARE PROVIDERS USING CDC, STATE, AND FEDERAL GUIDELINES

environmental services, laundry, security, engineering and facilities management, administrative, billing, and volunteer personnel." To the extent that other staff, including correctional officers, meet this definition they would be required to comply with the testing requirements. This Order does not apply to inmates.

In state correctional facilities, other staff who do not meet this definition are subject to vaccine verification and testing pursuant to separate state requirements.

If a homeless provider also acts as a daycare facility - what do they do if the ratio of childcare professionals fall below state requirements?

The homeless provider should confer with the California Department of Social Services (who license day care facilities) to discuss impacts and alternatives.

Covered health care settings

What facilities/offices are not covered under this Order?

- Acupuncture office
- Chiropractic office
- Naturopathic doctor office
- Occupational therapy office
- Optometry office
- Outpatient physical, speech, occupational therapy offices
- Pharmacies
- Podiatry office
- First aid offices (e.g., at a resort or theme park)

Does the Order cover unlicensed group and transitional housing facilities and homes?

No, the Order only covers those adult and residential care facilities licensed by the California Department of Social Services.

Are school-based clinics covered?

School-based clinics that are licensed are covered under the Order and would be required to follow all applicable rules for unvaccinated healthcare workers. Nurses' offices that are not licensed would be not covered by the State Heath Officer Order.

Will home health and hospice agencies be required to verify vaccine status of their staff?

Home health and hospice agencies are covered by the Order only with respect to agency staff who are providing care on site at one of the covered settings.

FOR MORE INFORMATION, VISIT:

CDPH.CA.GOV

COVID-19 Revised Emergency Temporary Standards

Effective January 14, 2022

- **3205 COVID-19 Prevention**
- **3205.1 Multiple COVID-19 Infections and COVID-19 Outbreaks**
- **3205.2 Major COVID-19 Outbreaks**
- **3205.3 COVID-19 Prevention in Employer-Provided Housing**
- **3205.4 COVID-19 Prevention in Employer-Provided Transportation**

Click Articles to View via Website

For more information, see Cal/OSHA: https://www.dir.ca.gov/dosh/coronavirus/ETS.html

CHIROPRACTORS ARE ESSENTIAL WORKERS

www.covid19.ca.gov/essential-workforce/

Essential workforce, if remote working is not practical:

1. Health care providers and caregivers (including physicians, dentists, psychologists, mid-level practitioners, nurses, assistants, and aids; infection control and quality assurance personnel; pharmacists; physical, respiratory, speech and occupational therapists and assistants; social workers and providers serving individuals with disabilities including developmental disabilities; optometrists; speech pathologists; **chiropractors;** diagnostic and therapeutic technicians; and radiology technologists).

CHIROPRACTORS ARE ESSENTIAL WORKERS

www.covid19.ca.gov/essential-workforce/

2. Workers required for effective clinical, command, infrastructure, support service, administrative, security and intelligence operations across the direct patient care and full healthcare and public health spectrum, including accounting, administrative, admitting and discharge, engineering, accrediting, certification, licensing, credentialing, epidemiological, source plasma and blood donation, food service, environmental services, housekeeping, medical records, information technology and operational technology, nutritionists, sanitarians; emergency medical services workers; prehospital workers including but not limited to urgent care workers; inpatient and hospital workers; outpatient care workers; home care workers; workers at long-term care facilities, residential and community-based providers; workplace safety workers).

Please read before entering.

IF YOU HAVE

Please call our office before coming inside.
Clinic Phone # _____

The clinic staff may ask you to wear a mask or use tissues to cover your cough.

Thank you for helping us keep our patients and staff safe.

For more information: **www.cdc.gov/COVID19**

https://www.cdc.gov/coronavirus/2019-ncov/healthcare-facilities/index.html

II. BASIC SCIENCE (NUTRITION)

A. INFLAMMATION
   a) Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol, including legal hemp for anti-inflammatory management.
   b) Literature review
B. DIGESTION
   a) Green Alkaline foods for fiber and digestion
   b) Colon Health
   c) Minerals and Collagen Protein
D. AMINO ACIDS
   a) Definitions
   b) Amino acids for cardiovascular health
   c) Nitric oxide production

INFLAMMATION: WHAT IS IT?

Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol.

1. What is an inflammation?. *Institute for Quality and Efficiency in Health Care (IQWiG)*. 2015. Available at: https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0072482/. Accessed October 12, 2016

CAUSES OF INFLAMMATION

Possible Causes of Inflammation:

- Pathogens (germs) like bacteria, viruses
- External injuries (i.e. Sports, Work-related, or Trauma)
- Chemicals found in OTC or prescription medications, environmental and product exposure
- Any disease, disorder, condition ending in “-itis.”

What is an inflammation?. Institute for Quality and Efficiency in Health Care (IQWiG). 2015. Available at: https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0072482/. Accessed October 12, 2016.

INFLAMMATION & AUTOIMMUNE DISEASE

Autoimmune Diseases: The immune system attacks itself causing harmful inflammatory responses (*i.e. AIDS/HIV*)

- Rheumatoid arthritis | Inflammation of joints
  - mainly hands
- Psoriasis | Inflammation of skin
  - mainly elbow
- Crohn's/ ulcerative colitis | Inflammation of bowel

What is an inflammation?. Institute for Quality and Efficiency in Health Care (IQWiG). 2015. Available at: https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0072482/. Accessed October 12, 2016.

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NATURAL INFLAMMATION REDUCTION TREATMENT OPTIONS

RESEARCH: CANNABIDIOL, CANNABINOL, & CANNABIGEROL FOR ANTI-INFLAMMATORY PROTOCOL

Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol, including legal hemp for anti-inflammatory management.

CBD: ANTI-INFLAMMATORY NUTRITIONAL OPTION

Cannabidiol: A Non-psychoactive cannabinoid

- *Analgesic*
- *Anti-inflammatory*
- *Neuroprotective*

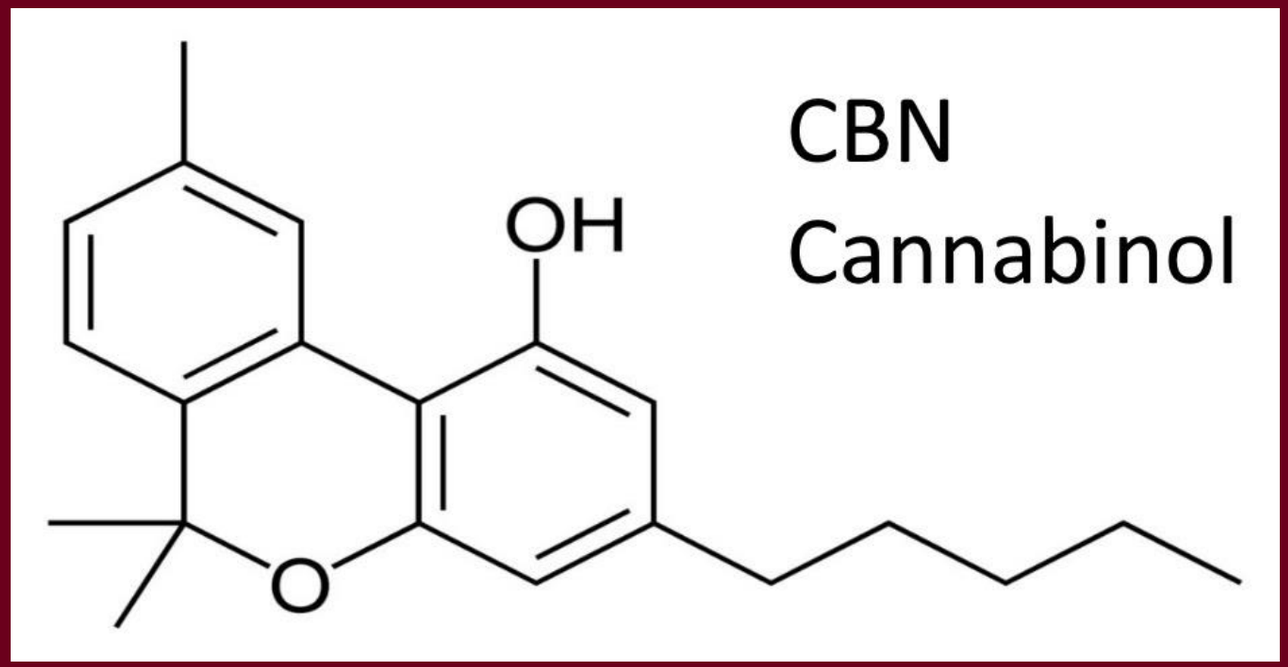
Lucas, C. J., Galettis, P., & Schneider, J. (2018). The Pharmacokinetics and the Pharmacodynamics of Cannabinoids. *British Journal of Clinical Pharmacology*. doi:10.1111/bcp.13710

Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol, including legal hemp for anti-inflammatory management.

CBN: ANTI-INFLAMMATORY NUTRITIONAL OPTION

Cannabinol: A Non-psychoactive cannabinoid

- Sedative
- Anti-inflammatory



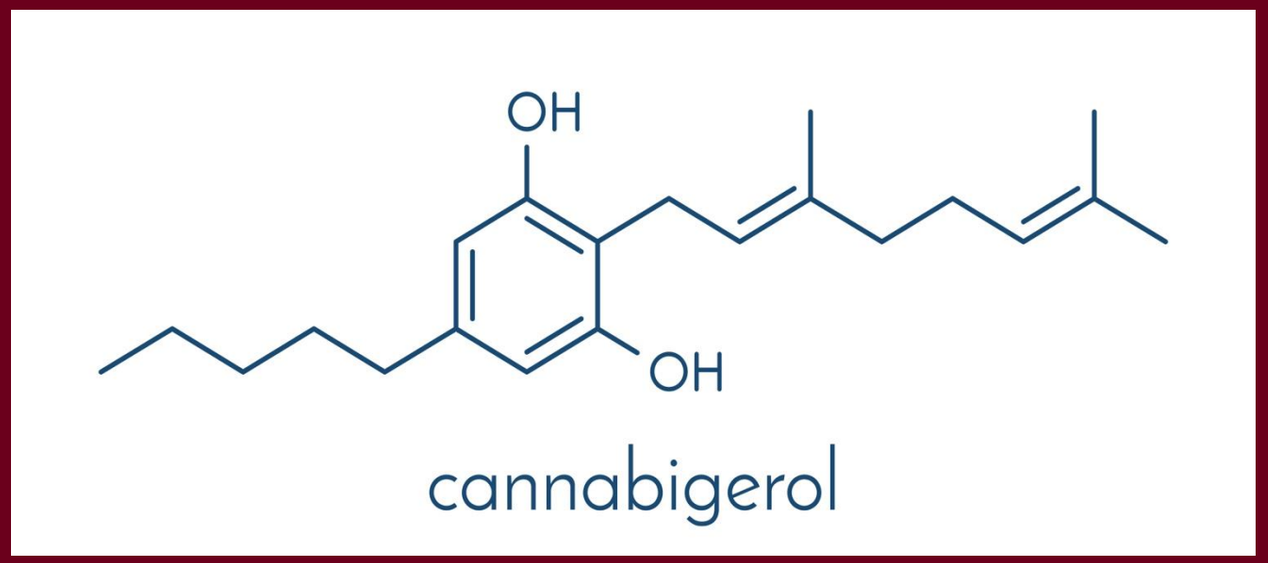
Lucas, C. J., Galettis, P., & Schneider, J. (2018). The Pharmacokinetics and the Pharmacodynamics of Cannabinoids. *British Journal of Clinical Pharmacology*. doi:10.1111/bcp.13710

Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol, including legal hemp for anti-inflammatory management.

CBG: AN ANTI-INFLAMMATORY NUTRITIONAL OPTION

Cannabigerol: A Non-psychoactive cannabinoid

- Anti-inflammatory
- Analgesic
- Effective for:
    - Psoriasis
    - Neuropsychiatric Disorders (ADHD, PTSD)
    - Inflammatory Bowel Disease



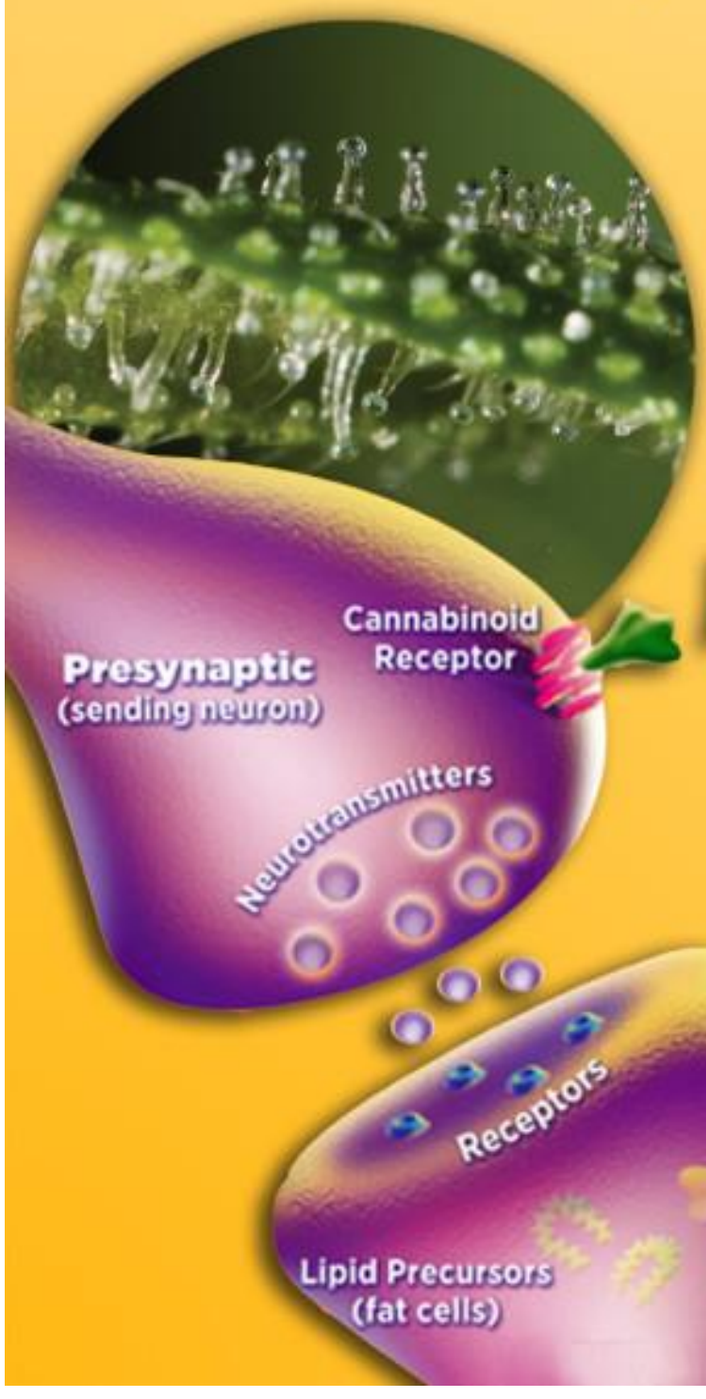
Lucas, C. J., Galettis, P., & Schneider, J. (2018). The Pharmacokinetics and the Pharmacodynamics of Cannabinoids. *British Journal of Clinical Pharmacology*. doi:10.1111/bcp.13710

The Human Endocannabinoid System

THC and CBN are known to "fit" like lock and key into network of existing receptors . The Endocannabinoid System exists to receive cannabinoids produced inside the body called "Anadnamide" and "2-Arachidonyl-glycerol". Stimulating the ECS with plant-based cannabinoids restores balance and helps maintain symptoms.

CB1 receptors are concentrated in the brain and central nervous system but also sparsely populates other parts of the human body.

Receptors are found on cell surfaces



THC

Tetrahydrocannibinol

CB1

CBD

Cannabidiol

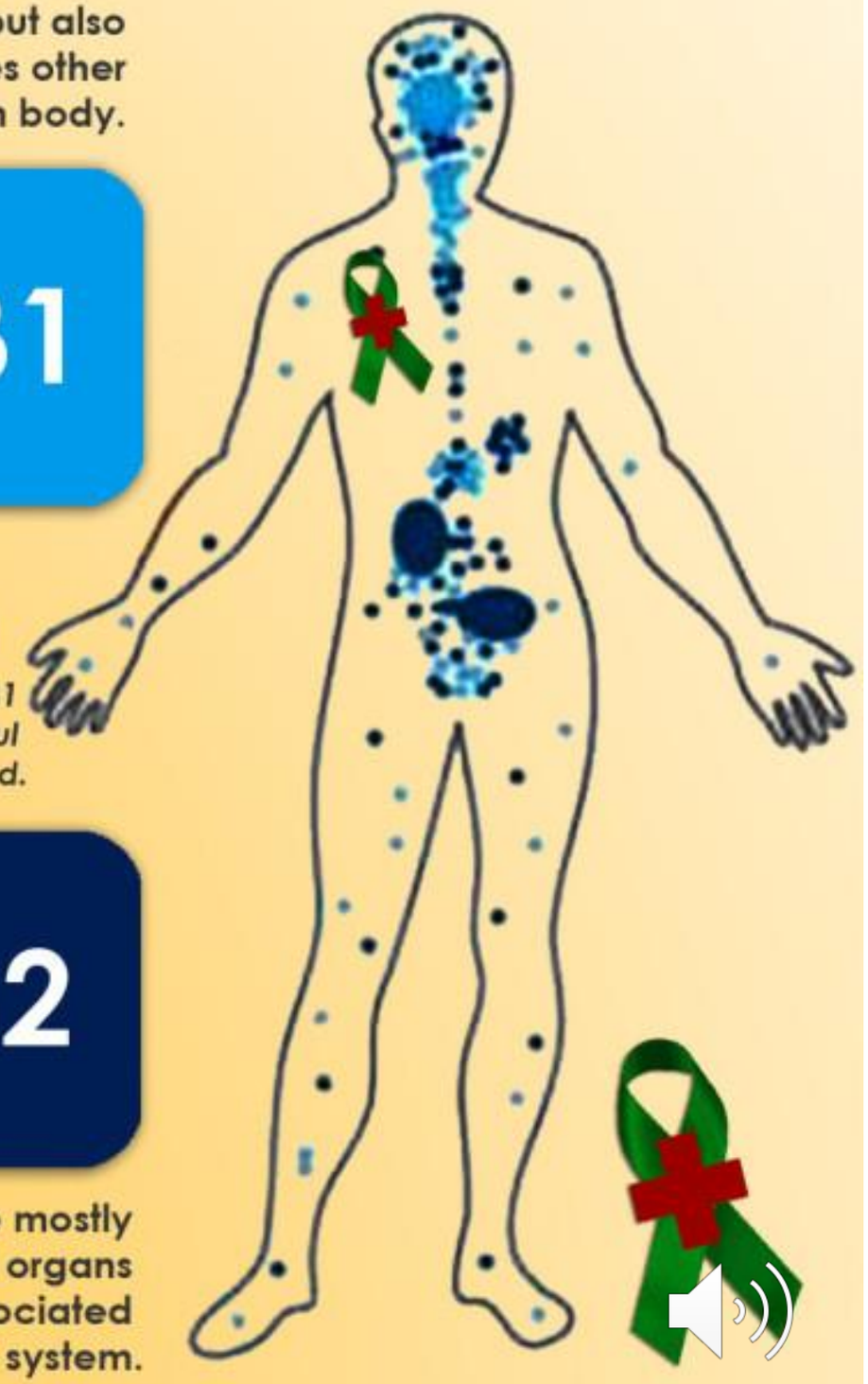
CBD does not directly "fit" CB1 or CB2 receptors but has powerful indirect effects still being studied.

CBN

Cannabinol

CB2

CB2 receptors are mostly in the perepheral organs especially cells associated with the immune system.



www.the-human-solution.org

WHAT SHOULD I LOOK FOR WHEN CONSIDERING CBD AS A THERAPEUTIC OPTION?

- Consider extraction methods:
  - Alcohol/Solvent Extraction
  - CO2 Extraction

- Be cautious of products with:
  - Flavors, sugars, unpronounceable ingredients

ALCOHOL SOLVENT EXTRACTION (WORST METHOD)

- Ethanol, low-grade alcohol & butane (most-commonly used)
- Chlorophyll extracted together with cannabinoids & terpenes (leaves dark color and bitter flavor)
- Additional post processing required to remove the chlorophyll reducing potency of the oil
- Destroys plant waxes

SUPERCRITICAL CO2 EXTRACTION

Most superior & expensive CBD extraction method

The pressure and temperature of carbon dioxide (CO2) is manipulated over time to reach supercritical phase

CO2 passed through high-quality hemp

CO2 extracts oils without denaturing the phytocannabinoids, terpenes & flavonoids

HOW MUCH CBD FOR INFLAMMATION MANAGEMENT?

- Start low dosage, go slow and increase as needed for symptomatic relief

- Start with recommended dosage
  - Assess how you feel after one week

CBD SAFETY PROFILE

- CBD Does not alter HR, BP, or body temperature
- No negative influence on food intake, gastrointestinal transit, psychomotor or psychological functions

Iffland, K., & Grotenhermen, F. (2017). An update on safety and side effects of cannabidiol: A review of clinical data and relevant animal studies. *Cannabis and Cannabinoid Research, 2*(1), 139-154. doi:10.1089/can.2016.0034

DIFFERENT OPTIONS OF DELIVERY & BIOAVAILABILITY FOR INFLAMMATION MANAGEMENT

Oral ~ 6% bioavailability
(gel capsules)

- Undergoes extensive hepatic first-pass metabolism
- Slow working & requires higher serving sizes

Inhalation ~ 31% bioavailability
(vaporizing)

- Avoids extensive hepatic first-pass metabolism
- More instantaneous
- Requires lower serving sizes
- Not recommended for people with asthma, SOB, respiratory issues

DIFFERENT OPTIONS OF DELIVERY & BIOAVAILABILITY FOR INFLAMMATION MANAGEMENT

- **Oromucosal 30% bioavailability~**
  (CBD Oil with dropper recommendations on bottle)
  - Avoids extensive hepatic first-pass metabolism
  - Rapid absorption (useful for symptoms requiring rapid relief)
  - Drops under tongue
    Hold under the tongue 60-90 seconds

DIFFERENT OPTIONS OF DELIVERY & BIOAVAILABILITY FOR INFLAMMATION MANAGEMENT

- **Topical administration** **30% bioavailability**
  - HIGH ABSORPTION RATE

  - Avoids first-pass metabolism

  -- Used for:

    - Inflammation / pain

  --- Types:

    - Salve
    - Rollerball
    - Recovery stick

Most Popular with Chiropractors!

Lucas, C. J., Galettis, P., & Schneider, J. (2018). The Pharmacokinetics and the Pharmacodynamics of Cannabinoids. *British Journal of Clinical Pharmacology*. doi:10.1111/bcp.13710

WHAT CONCENTRATION OF CBD SHOULD BE CONSIDERED FOR INFLAMMATION MANAGEMENT?

500mg, 600mg, 750mg, 1000mg:

- Used by those trying to target a specific health concern

2500mg:

- For those who have experience with CBD
- Severe pain / accident
- Terminal illness pain

CLINICAL PRACTICE GUIDELINES FOR CANNABIS AND CANNABINOID-BASED MEDICINES IN THE MANAGEMENT OF CHRONIC PAIN AND CO-OCCURRING CONDITIONS

Date & Journal: Cannabis Cannabinoid Res. 2024 Apr

Background: One in five individuals live with chronic pain globally, which often co-occurs with sleep problems, anxiety, depression, and substance use disorders. Although these conditions are commonly managed with cannabinoid-based medicines (CBM), health care providers report lack of information on the risks, benefits, and appropriate use of CBM for therapeutic purposes. Aims: We present these clinical practice guidelines to help clinicians and patients navigate appropriate CBM use in the management of chronic pain and co-occurring conditions.

Results: From our literature search, 70 articles met inclusion criteria and were utilized in guideline development, including 19 systematic reviews and 51 original research studies. Research typically demonstrates moderate benefit of CBM in chronic pain management. There is also evidence for efficacy of CBM in the management of comorbidities, including sleep problems, anxiety, appetite suppression, and for managing symptoms in some chronic conditions associated with pain including HIV, multiple sclerosis, fibromyalgia, and arthritis.

Conclusions: All patients considering CBM should be educated on risks and adverse events. Patients and clinicians should work collaboratively to identify appropriate dosing, titration, and administration routes for each individual.

Bell AD, MacCallum C, Margolese S, Walsh Z, Wright P, Daeninck PJ, Mandarino E, Lacasse G, Kaur Deol J, de Freitas L, St Pierre M, Belle-Isle L, Gagnon M, Bevan S, Sanchez T, Arlt S, Monahan-Ellison M, O'Hara J, Boivin M, Costiniuk C. Clinical Practice Gu

DIVERSITY OF MOLECULAR TARGETS AND SIGNALING PATHWAYS FOR CBD

Date & Journal: Pharmacology Research Perspectives . 2020 Dec

Abstract

Cannabidiol (CBD) is the second most abundant component of the Cannabis plant and is known to have effects distinct from Δ^9 -tetrahydrocannabinol (THC). Many studies that examined the behavioral effects of CBD concluded that it lacks the psychotomimetic effects attributed to THC. However, CBD was shown to have a broad spectrum of effects on several conditions such as anxiety, inflammation, neuropathic pain, and epilepsy. It is currently thought that CBD engages different targets and hence CBD's effects are thought to be due to multiple molecular mechanisms of action. A well-accepted set of targets include GPCRs and ion channels, with the serotonin 5-HT_{1A} receptor and the transient receptor potential cation channel TRPV1 channel being the two main targets. CBD has also been thought to target G protein-coupled receptors (GPCRs) such as cannabinoid and opioid receptors. Other studies have suggested a role for additional GPCRs and ion channels as targets of CBD. Currently, the clinical efficacy of CBD is not completely understood. Evidence derived from randomized clinical trials, in vitro and in vivo models and real-world observations support the use of CBD as a drug treatment option for anxiety, neuropathy, and many other conditions. Hence an understanding of the current status of the field as it relates to the targets for CBD is of great interest so, in this review, we include findings from recent studies that highlight these main targets.

de Almeida DL, Devi LA. Diversity of molecular targets and signaling pathways for CBD. Pharmacol Res Perspect. 2020 Dec;8(6):e00682. doi: 10.1002/prp2.682. PMID: 33169541; PMCID: PMC7652785.

CANNABIS COMPOUNDS EXHIBIT ANTI-INFLAMMATORY ACTIVITY IN VITRO IN COVID-19-RELATED INFLAMMATION IN LUNG EPITHELIAL CELLS AND PRO-INFLAMMATORY ACTIVITY IN MACROPHAGES

Date & Journal: Scientific Report. 2021 Jan 14.

Abstract

Cannabis sativa is widely used for medical purposes and has anti-inflammatory activity. This study intended to examine the anti-inflammatory activity of cannabis on immune response markers associated with coronavirus disease 2019 (COVID-19) inflammation. An extract fraction from C. sativa Arbel strain (F_{CBD}) substantially reduced (dose dependently) interleukin (IL)-6 and -8 levels in an alveolar epithelial (A549) cell line. F_{CBD} contained cannabidiol (CBD), cannabigerol (CBG) and tetrahydrocannabivarin (THCV), and multiple terpenes. Treatments with F_{CBD} and a F_{CBD} formulation using phytocannabinoid standards ($F_{CBD:std}$) reduced IL-6, IL-8, C-C Motif Chemokine Ligands (CCLs) 2 and 7, and angiotensin I converting enzyme 2 (ACE2) expression in the A549 cell line. Treatment with F_{CBD} induced macrophage (differentiated KG1 cell line) polarization and phagocytosis in vitro, and increased CD36 and type II receptor for the Fc region of IgG (FcγRII) expression. F_{CBD} treatment also substantially increased IL-6 and IL-8 expression in macrophages. $F_{CBD:std}$, while maintaining anti-inflammatory activity in alveolar epithelial cells, led to reduced phagocytosis and pro-inflammatory IL secretion in macrophages in comparison to F_{CBD}. The phytocannabinoid formulation may show superior activity versus the cannabis-derived fraction for reduction of lung inflammation, yet there is a need of caution proposing cannabis as treatment for COVID-19.

Anil SM, Shalev N, Vinayaka AC, Nadarajan S, Namdar D, Belausov E, Shoval I, Mani KA, Mechrez G, Koltai H. Cannabis compounds exhibit anti-inflammatory activity in vitro in COVID-19-related inflammation in lung epithelial cells and pro-inflammatory activi

ADDITIONAL REFERENCES:

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Carroon, J., & Phillips, J. A. (2018). A cross-sectional study of cannabidiol users. *Cannabis and Cannabinoid Research, 3*(1), 152-161. doi:10.1089/can.2018.000

De Gregoria, D., McLaughlin R. J., Posa, L., Ochoa-Sanches, R., Enns, J., Lopez-Canul, M., et al. (2018). Cannabidiol modulates serotonergic transmission and prevents allodynia and anxiety-like behavior in a model of neuropathic pain. *Pain*. Published Ahead of Print. doi:10.1097/j.pain.0000000000001386

Dustin Solak. Introduction to the Endocannabinoid System - NORML - Working to Reform Marijuana Laws. http://norml.org/library/item/introduction-to-the-endocannabinoid-system. Accessed September 19, 2018.

Fine, P. G. F., & Rosenfeld, M. J. (2013). The Endocannabinoid System, Cannabinoids, and Pain. *Rambam Maimonides Medical Journal, 4*(4), 1-15.

Hammel, D. C., Zhang, L. P., Ma, F., Abshire, S. M., McIlwrath, S. L., Stinchcomb, A. L., et al. (2016). Transdermal cannabidiol reduces inflammation and pain-related behaviours in a rat model of arthritis. *European Journal of Pain, 16*(11), 1248-1257. doi:10.1038/nm.2235

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Lucas, C. J., Galettis, P., & Schneider, J. (2018). The Pharmacokinetics and the Pharmacodynamics of Cannabinoids. *British Journal of Clinical Pharmacology*. doi:10.1111/bcp.13710

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Linares, I. M. P., Guimaraes, F. S., Eckeli, A., Crippa, A. C. S., Zuardi, A. W., Souza, J. D. S., et al. (2018). No acute effects of cannabidiol on the sleep-wake cycle of healthy subjects: a randomized, double-blind, placebo-controlled, crossover study. *Frontiers in Pharmacology, 9*(315), 1-8. doi:10.3389/fphar.2018.00315

Mandolini, G. M., Lazzaretti, M., Pigoni, A., Oldani, L., Delvecchio, G., & Brambilla, P. (2018). Pharmacological properties of cannabidiol in the treatment of psychiatric disorders: a critical overview. *Epidemiology and Psychiatric Sciences, 27*, 327-335. doi:10.1017/S2045796018000239

BASIC SCIENCE (NUTRITION)

NUTRITIONAL SUPPLEMENTS AND SPECIAL DIETARY RECOMMENDATIONS FOR AN ANTI-INFLAMMATORY PROTOCOL.

RESEARCH: TURMERIC, CURCUMIN, GINGER, BLACK PEPPER, SAFFRON, & BROMELAIN

CURCUMIN, CURCUMINOIDS, & TURMERIC RESEARCH

CURCUMINOIDS

THE GOLDEN SPICE CURCUMIN IN CANCER: A PERSPECTIVE ON FINALIZED CLINICAL TRIALS DURING THE LAST 10 YEARS

Date & Journal: J Cancer Res Ther . Jan-Mar 2022.

Abstract

Curcumin, the key bioactive phytochemical present in turmeric (Curcuma longa L.), is the most studied natural compound in cancer. Preclinical studies (in vitro and in vitro) and clinical trials have demonstrated curcumin's effectiveness as an anti-inflammatory agent. The existing evidence supports that curcumin inhibits the proliferation of many types of cancer cells and can play an important role in cancer therapy. This study analyses the existing evidence in the literature on finalized clinical trials (2010-2020) related to the effect of curcumin and turmeric-derived products that focused on different types of cancers, such as chronic myeloid leukemia, multiple myeloma, prostate, colorectal and pancreatic cancer as well as cancer therapy-related complications, including oral mucositis and radiation dermatitis. Original English language articles and clinical trials published between 2010 and 2020 were searched using mainstream scholarly databases, such as PubMed, ScienceDirect, Google Scholar, and ClinicalTrials.gov. The keywords, such as "curcumin," "turmeric," "cancer," "anti-inflammatory," and "clinical trials," were used in various combinations. A total of 21 clinical trials were selected, reviewed, and included in this study. Sixteen out of 21 clinical trials were associated with the effectiveness of curcumin or turmeric on various types of cancer, and the other five clinical trials were related to the evaluation of the efficacy of curcumin or turmeric in relieving the side effects of cancer chemotherapy and radiotherapy. The emerging data from the clinical trials confirm that curcumin has the potential for cancer prevention and intervention. However, it is not yet clear whether long-term curcumin supplementation has similar benefits.

Karaboga Arslan AK, Uzunhisarcıklı E, Yerer MB, Bishayee A. The golden spice curcumin in cancer: A perspective on finalized clinical trials during the last 10 years. J Cancer Res Ther. 2022 Jan-Mar;18(1):19-26. doi: 10.4103/jcrt.JCRT_1017_20. PMID: 353817

CURCUMIN SUPPLEMENTATION IMPROVES OXIDATIVE STRESS AND INFLAMMATION BIOMARKERS IN PATIENTS UNDERGOING HEMODIALYSIS: A SECONDARY ANALYSIS OF A RANDOMIZED CONTROLLED TRIAL

Date & Journal: Int Urol Nephrol . 2022 Mar 26.

Abstract

Background and objectives: Recent studies have shed light on the potential role of curcumin in mitigating inflammation in patients with chronic kidney disease (CKD). This study aimed to evaluate the effects of curcumin supplementation on plasma levels of markers of inflammation and oxidative stress in patients with CKD undergoing hemodialysis (HD).

Results: After 12 weeks of supplementation with curcumin, the TNF-a plasma levels were significantly reduced [from 15.0 (8.23-73.3) to 6.17 (1.11-55.0) pg/mL, p = 0.01].

Conclusion: 12 weeks of treatment with curcumin in HD patients resulted in a reduction in the biomarker of inflammation (TNF-a), confirming our previous hypothesis that curcumin has an anti-inflammatory effect.

Alvarenga L, Cardozo LFMF, Da Cruz BO, Paiva BR, Fouque D, Mafra D. Curcumin supplementation improves oxidative stress and inflammation biomarkers in patients undergoing hemodialysis: a secondary analysis of a randomized controlled trial. Int Urol Nephrol

BENEFICIAL EFFECTS ON ABDOMINAL BLOATING WITH AN INNOVATIVE FOOD-GRADE FORMULATION OF *CURCUMA LONGA* AND *BOSWELLIA SERRATA* EXTRACTS IN SUBJECTS WITH IRRITABLE BOWEL SYNDROME AND SMALL BOWEL DYSBIOSIS

Date & Journal: Nutrients . 2022 Jan 18.

Abstract

Bloating is a symptom frequently reported by subjects with irritable bowel syndrome (IBS) and small bowel dysbiosis, and Low FODMAP's diet (LFD) has been used to treat them. Extracts of *Curcumalonga* and *Boswelliaserrata* share anti-inflammatory and antimicrobial effects that could be useful in the management of these clinical conditions. The aim of this study was to evaluate the efficacy of curcumin and boswellia extracts (as Curcumin Boswellia Phytosome, CBP) and LFD on the relief of abdominal bloating in IBS subjects with small bowel dysbiosis, in comparison to LFD alone, in a 30-day supplementation, randomized trial. IBS participants were randomized to either the intervention (500 mg bid of CBP and LFD) or control arm (LFD). Small bowel dysbiosis has been defined by an increase of urinary indican with normal urinary skatole. A total of 67 subjects were recruited. The intervention group (33 subjects) showed a significant decrease (*p* < 0.0001) of bloating, abdominal pain, and indican values at the end of the study, when compared to the control group (34 subjects). Moreover, the subjects of the intervention group showed a significantly better (*p* < 0.0001) global assessment of efficacy (GAE) as compared to controls. In conclusion, in subjects with IBS and small bowel dysbiosis, abdominal bloating can be successfully reduced with a supplementation with CBP and LFD.

Giacosa A, Riva A, Petrangolini G, Allegrini P, Fazia T, Bernardinelli L, Peroni G, Rondanelli M. Beneficial Effects on Abdominal Bloating with an Innovative Food-Grade Formulation of Curcuma longa and Boswellia serrata Extracts in Subjects with Irritable

THE IMPACT OF CURCUMIN AND ITS MODIFIED FORMULATIONS ON ALZHEIMER'S DISEASE.

DATE & JOURNAL: J CELL PHYSIOL. 2019 MAR 7

- Alzheimer's disease (AD) is a major health problem worldwide, with no effective treatment approach. Curcumin is the main ingredient of turmeric traditionally used in Asian medicine. Several experimental studies have indicated the protective effect of curcumin and its novel formulations in AD. Curcumin has antioxidant, anti-inflammatory and neurotrophic activities, proposing a strong potential to prevent neurodegenerative diseases. However, there are no sufficient clinical trials to confirm curcumin use in AD patients. Low bioavailability following oral administration of curcumin limits its usage in human. The present study was designed to gather the effects of curcumin and its modified formulations in human and experimental models of AD.

Farkhondeh T, Samarghandian S, Pourbagher-Shahri AM, Sedaghat M. The impact of curcumin and its modified formulations on Alzheimer's disease. J Cell Physiol. 2019 Aug;234(10):16953-16965. doi: 10.1002/jcp.28411. Epub 2019 Mar 7. PMID: 30847942.

CURCUMA LONGA L. AMELIORATES ASTHMA CONTROL IN CHILDREN AND ADOLESCENTS: A RANDOMIZED, DOUBLE-BLIND, CONTROLLED TRIAL.

DATE & JOURNAL: J ETHNOPHARMACOL. 2019 APR 13

- ETHNOPHARMACOLOGICAL RELEVANCE: Roots of Curcuma longa L. are used as medicine for millennia. They possess several pharmacological properties, including anti-inflammatory action, and can be suitable for asthma treatment.

- AIM OF THE STUDY: We aimed to test the hypothesis that, in children and adolescents with persistent asthma, the administration of powdered roots of C. longa for 6 months, in addition to standard treatment, compared to placebo, will result in better disease control.

- CONCLUSION: The powdered roots of C. longa led to less frequent nighttime awakenings, less frequent use of short-acting β-adrenergic agonists, and better disease control after 3 and 6 months, when compared to placebo.

Manarin G, Anderson D, Silva JME, Coppede JDS, Roxo-Junior P, Pereira AMS, Carmona F. Curcuma longa L. ameliorates asthma control in children and adolescents: A randomized, double-blind, controlled trial. J Ethnopharmacol. 2019 Jun 28;238:111882. doi: 10.

PIPERINE (BLACK PEPPER) RESEARC

THE EFFECT OF TURMERIC AND BLACK PEPPER POWDER INCORPORATED IN BREAKFAST ON POSTPRANDIAL GLYCEMIA, APPETITE, PALATABILITY, AND GASTROINTESTINAL WELL-BEING IN NORMAL-WEIGHT ADULTS

Date & Journal: Food Sci Nutr. 2024 Jan 16

Abstract

Culinary herbs and spices are primarily known as flavor enhancers, research suggests that black pepper (*Piper nigrum*) and turmeric (*Curcuma longa*) have now been proven to prevent many non-communicable chronic diseases such as diabetes. Bioactive components of black pepper and turmeric ameliorate glucose metabolism and appetite regulation. The present research was designed to investigate the impact of turmeric and black pepper on blood glycemia, gastrointestinal well-being, appetite, and palatability. In a randomized crossover study, four iso-caloric experimental meals each having 50 g of available carbohydrates were subjected to healthy human participants (N = 20). Turmeric and black pepper were incorporated in the breakfast meal, 1 g black pepper (BP), 1 g turmeric (TR), and combination of the (BP + TR) was added in the breakfast. Standard questionnaires were used to evaluate palatability, subjective appetite, and gastrointestinal well-being. Blood glycemia, subjective gastrointestinal well-being, and appetite were measured at 0, 30, 60, 120, and 180 min. Experimental meals BP and BP + TR resulted in lower blood glycemia ($p < .05$) significantly compared to control meal. A decrease in perceived eating ability and hunger, and an increase in satiety after BP + TR and BP meal was observed. No significant changes were observed after consuming test meals on gastrointestinal well-being. Compared to control and BP + TR meals, BP and TR meals had considerably lower palatability. Results showed that compared to the control intake of starchy meals supplemented with black pepper and turmeric reduced postprandial glycemia, hunger, and perceived eating ability without affecting gastrointestinal well-being.

Khan S, Arif M, Laraib H, Naqvi SN, Shah OA, Farooq U, Sami-Ullah M, Khan GA. The effect of turmeric and black pepper powder incorporated in breakfast on postprandial glycemia, appetite, palatability, and gastrointestinal well-being in normal-weight adult

EFFECT OF A FIXED COMBINATION OF CURCUMIN, ARTEMISIA, BROMELAIN, AND BLACK PEPPER ORAL ADMINISTRATION ON OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY INDICES IN PATIENTS WITH DIABETIC MACULAR EDEMA

Date & Journal: Nutrients . 2022 Apr 6.

Abstract

Background: To investigate the effects of a fixed combination of Curcumin (200 mg), Artemisia (80 mg), Bromelain (80 mg), and Black pepper (2 mg) on vascular parameters in mild to moderate diabetic macular edema (DME).

Results: A significant improvement of BCVA and CRT reduction was recorded at 6 months follow-up in the dietary complementary supplementation group compared to control (respectively $p = 0.028$ and $p = 0.0003$). VD of the total capillary plexus, microaneurysms count, glycaemia and HbA1c did not vary over the follow-up period between groups. Within the Intravit® group, poor responders tended to show a larger FAZ area, more microaneurysms, and a lower VD in the DCP compared to the good responders group (p < 0.0001).

Conclusions: A fixed combination of Curcumin, Artemisia, Bromelain, and Black pepper oral administration may have a positive impact on central retinal thickness, visual acuity, and VD of the DCP in compensated type 2 diabetic patients with mild DME.

Chiosi F, Rinaldi M, Campagna G, Manzi G, De Angelis V, Calabrò F, D'Andrea L, Tranfa F, Costagliola C. Effect of a Fixed Combination of Curcumin, Artemisia, Bromelain, and Black Pepper Oral Administration on Optical Coherence Tomography Angiography Indic

PIPERINE, AN ALKALOID OF BLACK PEPPER SEEDS CAN EFFECTIVELY INHIBIT THE ANTIVIRAL ENZYMES OF DENGUE AND EBOLA VIRUSES, AN IN SILICO MOLECULAR DOCKING STUDY

Virusdisease . 2020 Sep

Abstract: Ebola and Dengue are the critical diseases caused by RNA viruses, especially in the tropical parts of the globe, including Asia and Africa, and no prominent therapeutic options are available so far. Here, an effort was made to evaluate the efficacy of black pepper (*Piper nigrum* L.) alkaloid Piperine as a potential drug through computational docking simulation. Eight structurally essential proteins of Dengue and Ebola virus were selected as in silico docking targets for Piperine. Absorption, Distribution, Metabolism, and Excretion profile showed that Piperine was safe and possessed significant drug-like properties. Molecular dynamic simulation and binding free energy calculation showed that Piperine could inhibit Methyltransferase (PDB id 1L9K) of Dengue and VP35 Interferon Inhibitory Domain (PDB id 3FKE) of Ebola virus in comparison with the commercial antiviral Ribavirin. Furthermore, statistical analysis based on multivariate and clustering approaches revealed that Piperine had more affinity towards viral proteins than that of Ribavirin.

Nag A, Chowdhury RR. Piperine, an alkaloid of black pepper seeds can effectively inhibit the antiviral enzymes of Dengue and Ebola viruses, an in silico molecular docking study. Virusdisease. 2020 Sep;31(3):308-315. doi: 10.1007/s13337-020-00619-6. Epub 2020 Aug 5. PMID: 32904842; PMCID: PMC7458978.

HERBAL FORMULATION "TURMERIC EXTRACT, BLACK PEPPER, AND GINGER" VERSUS NAPROXEN FOR CHRONIC KNEE OSTEOARTHRITIS: A RANDOMIZED, DOUBLE-BLIND, CONTROLLED CLINICAL TRIAL

DATE & JOURNAL: PHYTOTHERAPY RESEARCH . 2020 AUG.

Abstract: Osteoarthritis is the most common articular disease that can lead to chronic pain and severe disability. Curcumin-an effective ingredient in turmeric with anti inflammatory property-plays an important role in protecting the joints against destructive factors. Gingerols and piperine, are the effective ingredients of ginger and black pepper, which may potentially enhance and sustain the effect of curcumin in this direction. To determine the effect of cosupplementation with turmeric extract, black pepper, and ginger on prostaglandin E2 (PGE2) in patients with chronic knee osteoarthritis, compared with Naproxen. Sixty patients with two different levels of knee osteoarthritis (Grade 2 and 3) were studied. Individuals were randomly assigned to receive daily turmeric extract, ginger, and black pepper together or Naproxen capsule for 4 weeks. PGE2 was evaluated by ELISA method. 24-hr recall was also assessed. All of participants completed the study. PGE2 decreased significantly in both groups ($p < .001$), but there was no significant differences between groups. The results of this study indicated that intake of the selected herbs twice a day for 4 weeks may improve the PGE2 levels in patients with chronic knee osteoarthritis similar to Naproxen drug.

Heidari-Beni M, Moravejolahkami AR, Gorgian P, Askari G, Tarrahi MJ, Bahreini-Esfahani N. Herbal formulation "turmeric extract, black pepper, and ginger" versus Naproxen for chronic knee osteoarthritis: A randomized, double-blind, controlled clinical tria

BIOLOGY-ORIENTED SYNTHESIS (BIOS) OF PIPERINE DERIVATIVES AND THEIR COMPARATIVE ANALGESIC AND ANTI-INFLAMMATORY ACTIVITIES.

PUBLISHED: MED CHEM . 2018.

Background: Serious side effects such as gastric intestinal ulcers, bleeding etc. are associated with most anti-inflammatory and analgesic drugs. So, there is a need to search novel, potent, and safer anti-inflammatory and analgesic drugs. Piperine alkaloid was isolated from Piper nigrum L. and some derivatives of piperine having azomethine, sulfamoyl, propanoyl, acetamoyl and heterocyclic oxadiazole were synthesized. The structures of synthetic derivatives were confirmed by using different spectroscopic techniques such as 1H-, 13C-NMR, EI-MS, and IR. Melting points were also determined for all compounds. Piperine and its all the synthetic derivatives were subjected to comparative in vivo evaluation of analgesic and anti-inflammatory activities at the oral dose of 6 mg/kg/day. Analgesic activity was evaluated by tail immersion, hot plate and acetic acid writhing methods, while antiinflammatory activity was evaluated by carrageenan-induced paw inflammation.

CONCLUSION: The newly identified molecules may serve as a lead for future research in connection of potent and safer anti-inflammatory and analgesic drug candidates.

Yasir A, Ishtiaq S, Jahangir M, Ajaib M, Salar U, Khan KM. Biology-Oriented Synthesis (BIOS) of Piperine Derivatives and their Comparative Analgesic and Antiinflammatory Activities. Med Chem. 2018;14(3):269-280. doi:

RESEARCH ON GINGER

GINGER POTENCY ON THE PREVENTION AND TREATMENT OF BREAST CANCER

Date & Journal: Breast Dis. 2023

Abstract

Background: Cancer is a type of disease caused by the uncontrolled growth of abnormal cells that can destroy body tissues. The use of traditional medicine naturally uses plants from ginger with the maceration method. The ginger plant is a herbaceous flowering plant with the Zingiberaceacea group.

Methods: This study uses the literature review method by reviewing 50 articles from journals and databases.

Results: A review of several articles, namely ginger has bioactive components such as gingerol. Ginger is used as a treatment in complementary therapies using plants. Ginger is a strategy with many benefits and functions as a nutritional complement to the body. This benefit has shown the effect of anti-inflammatory, antioxidant, and anticancer against nausea and vomiting due to chemotherapy in breast cancer.

Conclusion: Anticancer in ginger is shown by polyphenols associated with anti-metastatic, anti-proliferative, antiangiogenic, anti-inflammatory, cell cycle arrest, apoptosis, and autophagy. Therefore, consuming ginger regularly affects natural herbal therapy with the prevention and treatment of breast cancer and serves as a prevention against the effects of chemotherapy.

Usman AN, Manju B, Ilhamuddin I, Ahmad M, Ab T, Ariyandy A, Budiaman B, Eragradini AR, Hasan II, Hashim S, Sartini S, Sinrang AW. Ginger potency on the prevention and treatment of breast cancer. Breast Dis. 2023;42(1):207-212. doi: 10.3233/BD-239003. PMID

DOES DIET PLAY A ROLE IN REDUCING NOCICEPTION RELATED TO INFLAMMATION AND CHRONIC PAIN?

Date & Journal: Nutrition . 2019 Oct.

Abstract

Dietary habits are fundamental issues to assess when modulating health and well-being; however, different nutritional panels may help individuals prevent acute and chronic pain. Many substances, known to be active antioxidants and anti-inflammatory compounds, should serve this fundamental task. Antinociceptive and analgesic natural compounds include flavonoids, terumbone from ginger root, curcuminoids, ω-3 polyunsaturated fatty acids, and taurine. Furthermore, correct intake of trace elements and minerals is strategic to reduce inflammation-related pain. This review addresses these items in an effort to suggest new criteria for proper dietary supplementation to prevent pain.

Bjørklund G, Aaseth J, Doşa MD, Pivina L, Dadar M, Pen JJ, Chirumbolo S. Does diet play a role in reducing nociception related to inflammation and chronic pain? Nutrition. 2019 Oct;66:153-165. doi: 10.1016/j.nut.2019.04.007. Epub 2019 Apr 26. PMID: 313016

GINGER EXTRACT HAS ANTI-LEUKEMIA AND ANTI-DRUG RESISTANT EFFECTS ON MALIGNANT CELLS

Date & Journal: J Cancer Res Clin Oncol . 2019 Aug.

Abstract

Purpose: Based on the poor prognosis of drug resistance in pediatric acute lymphoblastic leukemia (ALL) and adverse effects of chemotherapy, this study was aimed to evaluate the effect of several herbal extracts on leukemic cells.

Results: The IC_{50}s for cinnamon, ginger and green tea extracts on ALL cell lines were 300 µg/ml, 167 µg/ml and 70 µg/ml, respectively. Surprisingly, the methotrexate (MTX)-resistant sub-line showed more sensitivity to ginger. Combined treatment with ginger and MTX showed synergistic effects on CCRF-CEM, Nalm-6 and ALL primary cells. It was shown that ginger does not impair the high expression levels of ABCA2 or ABCA3 transporter genes in the ALL malignant cells, suggesting other molecular pathways involved in its anticancer potential.

Conclusion: To the best of our knowledge, this is the first study that reveals the antileukemic effect of ginger extract on both, pediatric ALL cell lines and primary cells.

Rahimi Babasheikhali S, Rahgozar S, Mohammadi M. Ginger extract has anti-leukemia and anti-drug resistant effects on malignant cells. J Cancer Res Clin Oncol. 2019 Aug;145(8):1987-1998. doi: 10.1007/s00432-019-02949-5. Epub 2019 Jun 18. PMID: 31214760.

BLACK GINGER EXTRACT INCREASES PHYSICAL FITNESS PERFORMANCE AND MUSCULAR ENDURANCE BY IMPROVING INFLAMMATION AND ENERGY METABOLISM.

Published: Heliyon . 2016 May 24

We previously reported that polymethoxyflavones (PMFs) in black ginger (Kaempferia parviflora) extract (KPE) increased energy production by activating AMP-activated protein kinase (AMPK) in C2C12 myoblasts. We herein evaluated the effects of KPE on physical fitness performance and muscular endurance in mice. Male mice were orally administered KPE for 4 weeks, and then forced swimming test, open-field test, inclined plane test, and wire hanging test were performed. KPE significantly increased the swimming time, motility after swimming, and grip strength. IL-6 and TNF-α mRNA expression levels were decreased in the soleus muscle, whereas peroxisome proliferator-activated receptor γ coactivator (PGC)-1α and glycogen synthase mRNA expression levels, mitochondrial number, and glycogen content were increased. These results were in agreement with those obtained for KPE and PMFs in C2C12. Therefore, the activation of AMPK by PMFs may be one of the mechanisms by which KPE improves physical fitness performance and muscular endurance.

Toda K, Hitoe S, Takeda S, Shimoda H. Black ginger extract increases physical fitness performance and muscular endurance by improving inflammation and energy metabolism. Heliyon. 2016 May 24;2(5):e00115. doi: 10.1016/j.heliyon.2016.e00115. PMID: 27441286;

ACUTE EFFECTS OF GINGER EXTRACT ON BIOCHEMICAL AND FUNCTIONAL SYMPTOMS OF DELAYED ONSET MUSCLE SORENESS.

Published: Med J Islam Repub Iran . 2015 Sep 12.

BACKGROUND: Inflammation and pain induced by delayed onset muscle soreness (DOMS) as a result of eccentric exercise (EE) or unaccustomed activity cause some difficulties in exercise for athletes. The purpose of this study was to survey the effect of ginger extract on biochemical and functional symptom of delayed onset muscle soreness.

CONCLUSION: The finding of this study suggests that 2 grams of ginger may have anti-inflammation and analgesic effect on DOMS

Hoseinzadeh K, Daryanoosh F, Baghdasar PJ, Alizadeh H. Acute effects of ginger extract on biochemical and functional symptoms of delayed onset muscle soreness. Med J Islam Repub Iran. 2015 Sep 12;29:261. PMID: 26793652; PMCID: PMC4715415.

SAFFRON, BROMELAIN, & EDTA RESEARCH

BROMELAIN: A REVIEW OF ITS MECHANISMS, PHARMACOLOGICAL EFFECTS AND POTENTIAL APPLICATIONS

Date & Journal: Food Funct 2023 Sep 19

Abstract

The utilization of plant-derived supplements for disease prevention and treatment has long been recognized because of their remarkable potential. *Ananas comosus*, commonly known as pineapple, produces a group of enzymes called bromelain, which contains sulfhydryl moieties. Recent studies have shown that bromelain exhibits a wide range of activities, including anti-inflammatory, anti-diabetic, anti-cancer, and anti-rheumatic properties. These properties make bromelain a promising drug candidate for the treatment of various diseases. The anti-inflammatory activity of bromelain has been shown to be useful in treating inflammatory conditions such as osteoarthritis, rheumatoid arthritis, and asthma, whereas the anti-cancer activity of bromelain is *via* induction of apoptosis, inhibition of angiogenesis, and enhancement of the body's immune response. The anti-diabetic property of bromelain is owing to the improvement in glucose metabolism and reduction in insulin resistance. The therapeutic potential of bromelain has been investigated in numerous preclinical and clinical studies and a number of patents have been granted to date. Various formulations and delivery systems are being developed in order to improve the efficacy and safety of this molecule, including the microencapsulated form to treat oral inflammatory conditions and liposomal formulations to treat cancer. The development of novel drug delivery systems and formulations has further ameliorated the therapeutic potential of bromelain by improving its bioavailability and stability, while reducing the side effects. This review intends to discuss various properties and therapeutic applications of bromelain, along with its possible mechanism of action in treating various diseases. Recent patents and clinical trials concerning bromelain have also been covered.

Kumar V, Mangla B, Javed S, Ahsan W, Kumar P, Garg V, Dureja H. Bromelain: a review of its mechanisms, pharmacological effects and potential applications. Food Funct. 2023 Sep 19;14(18):8101-8128. doi: 10.1039/d3fo01060k. PMID: 37650738.

EFFECTS OF SAFFRON SUPPLEMENTATION ON IMPROVING SLEEP QUALITY: A META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

Date & Journal: Sleep Med. 2022 April.

Abstract

Objective: To compare the efficacy of different dosage regimens of saffron supplementation on improving sleep quality among healthy adults, patients with insomnia or type 2 diabetes and patients under Methadone maintenance treatment (MMT).

Results: The pooling of the effect sizes showed that saffron group achieve a notable treatment effect on PSQI (MD: -2.14; 95% CI: -2.86 to -1.42; P < 0.01), ISI (MD: -2.63; 95% CI: -3.70 to -2.55; P < 0.01) and RSQ (MD: 7.05; 95% CI: 1.48 to 12.62; P = 0.01) compared with placebo group.

Conclusion: Saffron supplementation as a treatment for improving sleep quality have promising clinical application as its great improvement on all efficacy outcomes and no serious adverse advents occurred as the dose was increased. The dose of 100 mg saffron supplementation per day was proved to achieve excellent and more stable curative effect on improving sleep quality in our subgroup analysis. However, further investigation is necessary to confirm the efficacy and long-term safety of different doses of saffron for insomnia.

Lian J, Zhong Y, Li H, Yang S, Wang J, Li X, Zhou X, Chen G. Effects of saffron supplementation on improving sleep quality: a meta-analysis of randomized controlled trials. Sleep Med. 2022 Apr;92:24-33. doi: 10.1016/j.sleep.2022.03.001. Epub 2022 Mar 6. P

THE MECHANISMS OF SAFFRON (CROCUS SATIVUS') ON THE INFLAMMATORY PATHWAYS OF DIABETES MELLITUS: A SYSTEMATIC REVIEW

Date & Journal: Diabetes Metab Syndr . 2022 Jan.

Abstract

Background: Diabetes is one of the major medical problems, which can lead to damage to cells or organs in various parts of the body. Saffron as herbal medicine has contained several active ingredients, including safranal, flavonoids, crocetin, and crocin, which are effective in modulating oxidative stress and inflammation, which can play the main role in reducing the effects of diabetes. However, so far, the effect of saffron on diabetes inflammation has not been evaluated in the form of systematic review studies. The purpose of this systematic study was to evaluate the evidence obtained from in-vitro, animal, and clinical trials studies on the effects of saffron on inflammation in diabetes.

Results: In the end, only 20 of the 596 articles met the criteria for analysis. Of the 20 articles, 3 were in-vitro studies, 13 were animal studies, and 4 were human studies.

Conclusion: The findings of this systematic study (Except for two studies) suggest that saffron supplementation with potential anti-inflammatory properties may reduce the expression of the inflammatory pathway and the production of inflammatory products in diabetes.

Nasimi Doost Azgomi R, Karimi A, Zarshenas MM, Moini Jazani A. The mechanisms of saffron (Crocus sativus') on the inflammatory pathways of diabetes mellitus: A systematic review. Diabetes Metab Syndr. 2022 Jan;16(1):102365. doi: 10.1016/j.dsx.2021.102365.

THE COMBINATION OF BROMELAIN AND CURCUMIN AS AN IMMUNE-BOOSTING NUTRACEUTICAL IN THE PREVENTION OF SEVERE COVID-19

Date & Journal: Metabol Open . 2020 Dec.

Abstract

The coronavirus disease 2019 (COVID-19) pandemic is still ongoing, while no treatment has been proven effective. COVID-19 pathophysiology involves the activation of three main pathways: the inflammatory, the coagulation and the bradykinin cascades. Here, we highlight for the first time the joint potential therapeutic role of bromelain and curcumin, two well-known nutraceuticals, in the prevention of severe COVID-19. Bromelain (a cysteine protease isolated from the pineapple stem) and curcumin (a natural phenol found in turmeric) exert important immunomodulatory actions interfering in the crucial steps of COVID-19 pathophysiology. Their anti-inflammatory properties include inhibition of transcription factors and subsequent downregulation of proinflammatory mediators. They also present fibrinolytic and anticoagulant properties. Additionally, bromelain inhibits cyclooxygenase and modulates prostaglandins and thromboxane, affecting both inflammation and coagulation, and also hydrolyzes bradykinin. Interestingly, curcumin has been shown in *silico* studies to prevent entry of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) into cells as well as viral replication, while a recent experimental study has demonstrated that bromelain may also inhibit viral entry into cells. Notably, bromelain substantially increases the absorption of curcumin after oral administration. To the best of our knowledge, this is the first report highlighting the significance of bromelain and, most importantly, the potential preventive value of the synergistic effects of bromelain and curcumin against severe COVID-19.

Kritis P, Karampela I, Kokoris S, Dalamaga M. The combination of bromelain and curcumin as an immune-boosting nutraceutical in the prevention of severe COVID-19. Metabol Open. 2020 Dec;8:100066. doi: 10.1016/j.metop.2020.100066. Epub 2020 Nov 13. PMID: 33205039; PMCID: PMC7661945.

BROMELAIN: A REVIEW ON ITS POTENTIAL AS A THERAPY FOR THE MANAGEMENT OF COVID-19

Niger J Physiol Sci . 2020 Jun 30

Abstract

Coronavirus Disease 2019 is a wide-spreading severe viral disease caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-COV-2) virus that needs to be urgently eradicated. SARS-COV-2 has infected millions of people worldwide and results in more than three hundred thousand deaths. Several repurposed drugs have failed to successfully eradicate the infection. Multiorgan failure caused by pronounced inflammation and systemic coagulation accounts for severe complications and death associated with diseases. Bromelain appears to be a potential candidate that may be used to inhibit or prevent the symptoms of the diseases. Its anti-inflammatory and anticoagulatory properties make it a potential agent that may slow the progression of the disease. In this review, we highlighted the beneficial effects of bromelain based on both experimental and clinical evidence that make bromelain a good candidate for the treatment of symptoms of CoVID-19 infection.

Owoyele BV, Bakare AO, Ologe MO. Bromelain: A Review on its Potential as a Therapy for the Management of Covid-19. Niger J Physiol Sci. 2020 Jun 30;35(1):10-19. PMID: 33084621.

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Serving Size: 3 capsules

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95% Standardized Curcuminoid	200mg*
Black Pepper Fruit Extract (Piperine)	10mg*

A proprietary blend of the following natural ingredients: Organic ginger root extract; saffron powder; bromelain. Other ingredients: Vegetable cellulose capsule; EDTA. Made with 72% organic ingredients. Daily value not established.

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II. BASIC SCIENCE (NUTRITION)

A. INFLAMMATION
   a) Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol, including legal hemp for anti-inflammatory management.
   b) Literature review
B. DIGESTION
   a) Green Alkaline foods for fiber and digestion
   b) Colon Health
   c) Minerals and Collagen Protein
D. AMINO ACIDS
   a) Definitions
   b) Amino acids for cardiovascular health
   c) Nitric oxide production

ALKALINE GREENS FOR FIBER AND DIGESTION

- Acid interferes with digestion as food stagnates and rots, lowering the pH of the body.

- A 16oz bottle of soda has a pH= 2. Very acidic. To bring the pH back up to our normal 7.3, we would have to dilute the soda with about 10 gallons of water.

- The blood must maintain a pH = 7.3-7.45. (Guyton) The body begins to sweep the extra acids into the tissues (muscles & joints). (lactic acid)

- Acidification will actually precipitate acids out of solution, in the form of crystals, salts, and stones (i.e. kidney & gall stones).

ASHWAGANDHA'S MULTIFACETED EFFECTS ON HUMAN HEALTH: IMPACT ON VASCULAR ENDOTHELIUM, INFLAMMATION, LIPID METABOLISM, AND CARDIOVASCULAR OUTCOMES-A REVIEW

Date & Journal: Nutrients. 2024 Jul 31

Abstract

Withania somnifera, commonly known as Ashwagandha, has been popular for many years. Numerous studies have shown that the extract of this plant, due to its wealth of active substances, can induce anti-inflammatory, neuroprotective, immunomodulatory, hepatoprotective, cardioprotective, anti-diabetic, adaptogenic, anti-arthritic, anti-stress, and antimicrobial effects. This review examines the impact of Ashwagandha extract on the vascular endothelium, inflammation, lipid metabolism, and cardiovascular outcomes. Studies have shown that Ashwagandha extracts exhibit an anti-angiogenic effect by inhibiting vascular endothelial growth factor (VEGF)-induced capillary sprouting and formation by lowering the mean density of microvessels. Furthermore, the results of numerous studies highlight the anti-inflammatory role of Ashwagandha extract, as the action of this plant causes a decrease in the expression of pro-inflammatory cytokines. Interestingly, withanolides, present in Ashwagandha root, have shown the ability to inhibit the differentiation of preadipocytes into adipocytes. Research results have also proved that *W. somnifera* demonstrates cardioprotective effects due to its antioxidant properties and reduces ischemia/reperfusion-induced apoptosis. It seems that this plant can be successfully used as a potential treatment for several conditions, mainly those with increased inflammation. More research is needed to elucidate the exact mechanisms by which the substances contained in *W. somnifera* extracts can act in the human body.

Wiciński M, Fajkiel-Madajczyk A, Kurant Z, Liss S, Szyperski P, Szambelan M, Gromadzki B, Rupniak I, Słupski M, Sadowska-Krawczenko I. Ashwagandha's Multifaceted Effects on Human Health: Impact on Vascular Endothelium, Inflammation, Lipid Metabolism, and

THE BENEFITS OF ASHWAGANDHA (WITHANIA SOMNIFERA) SUPPLEMENTS ON BRAIN FUNCTION AND SPORTS PERFORMANCE

Date & Journal: Front Nutr. 2024 Aug 2

Abstract

Ashwagandha or Withania somnifera is an herbal plant belonging to the Solanaceae family. Because of its wide range of phytochemicals, ashwagandha root extract has been used in numerous research studies, either alone or in conjunction with other natural plants, for various biomedical applications, which include its anti-microbial, anti-inflammatory, anti-stress, anti-tumor, cardioprotective, and neuroprotective properties. Additionally, it improves endothelial function, lowers reactive oxygen species, controls apoptosis, and improves mitochondrial function. These properties make it a useful treatment for a variety of conditions, including age-related symptoms, anxiety, neurodegenerative diseases, diabetes, stress, arthritis, fatigue, and cognitive/memory impairment. Despite the numerous benefits of ashwagandha supplementation, there have been just four meta-analyses on the herb's effectiveness in treating anxiety, neurobehavioral disorders, impotence, and infertility. Moreover, no reviews exist that examine how ashwagandha affects antioxidant response and physical sports performance. Consequently, the goal of this study was to analyze the scientific literature regarding the effects of ashwagandha consumption on antioxidant response and athletic performance.

Guo S, Rezaei MJ. The benefits of ashwagandha (*Withania somnifera*) supplements on brain function and sports performance. Front Nutr. 2024 Aug 2;11:1439294. doi: 10.3389/fnut.2024.1439294. PMID: 39155932; PMCID: PMC11327513.

NUTRITIONAL AND PHYTOCHEMICAL COMPOSITION AND ASSOCIATED HEALTH BENEFITS OF OAT (AVENA SATIVA) GRAINS AND OAT-BASED FERMENTED FOOD PRODUCTS

Date & Journal: ScientificWorldJournal. 2023 Jul 17

Abstract

Oats (*Avena sativa* L.) are a popular functional cereal grain due to their numerous health benefits. This review article summarized the information on the chemical composition and phytonutrients of oats grown in different countries. It also reviewed recently developed fermented oat products to highlight their potential for human health. Oats have an interesting nutritional profile that includes high-quality protein, unsaturated fats, soluble fiber, polyphenolic compounds, and micronutrients. Oat grain has a unique protein composition, with globulins serving as the primary storage protein, in contrast to other cereals, where prolamins are the main storage proteins. Oats have the highest fat content of any cereal, with low saturated fatty acids and high essential unsaturated fatty acid content, which can help reduce the risk of cardiovascular diseases. Oats are a good source of soluble dietary fiber, particularly *β*-glucan, which has outstanding functional properties and is extremely important in human nutrition. *β*-Glucan has been shown to lower blood cholesterol and glucose absorption in the intestine, thereby preventing diseases such as cardiovascular injury, dyslipidemia, hypertension, inflammatory state, and type 2 diabetes. Oats also contain high concentration of antioxidant compounds. Avenanthramides, which are unique to oats, are powerful antioxidants with high antioxidative activity in humans. Recognizing the nutritional benefits of oats, oat-based fermented food products are gaining popularity as functional foods with high probiotic potential.

Alemayehu GF, Forsido SF, Tola YB, Amare E. Nutritional and Phytochemical Composition and Associated Health Benefits of Oat (Avena sativa) Grains and Oat-Based Fermented Food Products. ScientificWorldJournal. 2023 Jul 17;2023:2730175. doi: 10.1155/2023/27

SOLARPLAST®-AN ENZYMATICALLY TREATED SPINACH EXTRACT

Date & Journal: Plants (Basel). 2023 Jul 18

Abstract

In the modern world we are constantly bombarded by environmental and natural stimuli that can result in oxidative stress. Antioxidant molecules and enzymes help the human body scavenge reactive oxygen species and prevent oxidative damage. Most organisms possess intrinsic antioxidant activity, but also benefit from the consumption of antioxidants from their diet. Leafy green vegetables such as spinach are a well-researched rich source of dietary antioxidant molecules. However, plant cell walls are difficult to digest for many individuals and the bio-accessibility of nutrients and antioxidants from these sources can be limited by the degree of digestion and assimilation. Through a specific enzymatic process, Solarplast® contains organic spinach protoplasts without the cell wall, which may facilitate higher yield and efficacy of beneficial antioxidant molecules. In this study, analytical techniques coupled to in vitro bioassays were used to determine the potential antioxidant activity of Solarplast® and determine its antioxidant enzymatic capabilities. Solarplast® demonstrated superior antioxidant activity when compared to frozen spinach leaves in TOC, FRAP and TEAC antioxidant assays. Several antioxidant enzymes were also increased in Solarplast®, when compared to frozen spinach. As a functional readout, Solarplast® attenuated hydrogen peroxide-, ethanol- and acetaminophen-induced increases in oxidative stress and cytotoxicity in both intestinal (HT-29) and liver (HepG2) cell lines. These findings suggest that Solarplast® may represent a non-GMO, plant-based food supplement to help reduce oxidative stress in the human body.

Simon A, Mazhar S, Khokhlova E, Leeuwendaal N, Phipps C, Deaton J, Rea K, Colom J. Solarplast®-An Enzymatically Treated Spinach Extract. Plants (Basel). 2023 Jul 18;12(14):2678. doi: 10.3390/plants12142678. PMID: 37514292; PMCID: PMC10384499.

INNOVATIVE VS CLASSICAL METHODS FOR DRYING HETEROTROPHIC CHLORELLA VULGARIS: IMPACT ON PROTEIN QUALITY AND SENSORY PROPERTIES

Date & Journal: Food Res Int. 2024 Apr

Abstract

Drying is a necessary step in the microalgae production chain to reduce microbial load and oxidative degradation of the end product. Depending on the differences in applied temperature and treatment time, the process of drying can have a substantial impact on protein quality and aroma, important characteristics determining the incorporation potential in food products. In this study, we compared the drying of heterotrophic Chorella vulgaris with both innovative (agitated thin film drying (ATFD), pulse combustion drying (PCD) and solar drying (SolD)) and commonly used drying techniques (spray drying (SprD) and freeze drying (FD)). To evaluate the impact on protein quality, we evaluated techno-functional properties, in vitro digestibility (INFOGEST) as well as protein denaturation using differential scanning calorimetry (DSC). A sensory analysis was performed by a trained expert panel, combined with headspace solid-phase microextraction (HS-SPME) - gas chromatography-mass spectrometry (GC-MS) to determine volatile organic compounds (VOCs). ATFD was found to increase techno-functional properties such as gelling, water holding and solubility as well as in vitro protein digestibility. These observations could be related to induced cell disruption and protein denaturation by ATFD. Sensory analysis indicated an increased earthy off-flavor after ATFD. Interestingly, the high-temperature PCD led to an increase in cacao odor while low-temperature FD resulted in lower flavor, odors and VOCs. These results demonstrate that protein quality and sensorial properties of C. vulgaris can be steered through the type of drying, which could help in the selection of application-specific drying methods. Overall, this work could promote the incorporation of microalgal single cell proteins in different innovative food products.

Van De Walle S, Gifuni I, Coleman B, Baune MC, Rodrigues A, Cardoso H, Fanari F, Muylaert K, Van Royen G. Innovative vs classical methods for drying heterotrophic Chlorella vulgaris: Impact on protein quality and sensory properties. Food Res Int. 2024 Apr

EXPLORING THE CHEMICAL AND PHARMACOLOGICAL VARIABILITY OF LEPIDIUM MEYENII: A COMPREHENSIVE REVIEW OF THE EFFECTS OF MACA

Date & Journal: : Front Pharmacol. 2024 Feb 19

Abstract

Maca (*Lepidium meyenii*), a biennial herbaceous plant indigenous to the Andes Mountains, has a rich history of traditional use for its purported health benefits. Maca's chemical composition varies due to ecotypes, growth conditions, and post-harvest processing, contributing to its intricate phytochemical profile, including, macamides, macaenes, and glucosinolates, among other components. This review provides an in-depth revision and analysis of Maca's diverse bioactive metabolites, focusing on the pharmacological properties registered in pre-clinical and clinical studies. Maca is generally safe, with rare adverse effects, supported by preclinical studies revealing low toxicity and good human tolerance. Preclinical investigations highlight the benefits attributed to Maca compounds, including neuroprotection, anti-inflammatory properties, immunoregulation, and antioxidant effects. Maca has also shown potential for enhancing fertility, combating fatigue, and exhibiting potential antitumor properties. Maca's versatility extends to metabolic regulation, gastrointestinal health, cardio protection, antihypertensive activity, photoprotection, muscle growth, hepatoprotection, proangiogenic effects, antithrombotic properties, and antiallergic activity. Clinical studies, primarily focused on sexual health, indicate improved sexual desire, erectile function, and subjective wellbeing in men. Maca also shows promise in alleviating menopausal symptoms in women and enhancing physical performance. Further research is essential to uncover the mechanisms and clinical applications of Maca's unique bioactive metabolites, solidifying its place as a subject of growing scientific interest.

Ulloa Del Carpio N, Alvarado-Corella D, Quiñones-Laveriano DM, Araya-Sibaja A, Vega-Baudrit J, Monagas-Juan M, Navarro-Hoyos M, Villar-López M. Exploring the chemical and pharmacological variability of Lepidium meyenii: a comprehensive review of the effec

MACA ROOTS: A POTENTIAL THERAPEUTIC IN THE MANAGEMENT OF METABOLIC DISORDERS THROUGH THE MODULATION OF METABOLIC BIOCHEMICAL MARKERS IN RATS FED HIGH-FAT HIGH-CARBOHYDRATE DIET

Date & Journal: J Ethnopharmacol. 2024 Mar

Abstract

Ethnopharmacological relevance: Maca root (Lepidium meyenii Walp.) is a Peruvian plant of the Brassicaceae family. Maca roots are popular food supplements used to treat a variety of ailments described traditionally as enhancing metabolic and health conditions.

Aim of the study: Metabolic syndrome (MetS) has been the real scourge globally, affecting more than one-fourth of the global population. MetS causes the development of multi-organ illnesses, including altered blood cholesterol and sugar levels, oxidative stress, and hypertension. This study evaluated maca root total methanolic extract (MTE) as a potential nutraceutical to manage the complications of MetS.

Results: One month of MTE supplementation in HFCD-fed rats remarkably decreased the elevation of blood glucose and lipids, improved liver function and insulin resistance, additionally it successfully restored the state of inflammatory and oxidative stress. The extract was standardized to contain total phenolics equal to 24.45 ± 0.96 µg Gallic acid/mg extract.

Conclusions: Our findings suggest that MTE improves MetS by reducing hyperglycemia, hyperlipidemia, inflammation, and oxidative stress. While also improving beta cell secretory functions, implying that MTE could be used as a balancing drug in the prevention and treatment of metabolic abnormalities linked to type 2 diabetes.

Mohamed SM, Shalaby MA, El-Shiekh RA, Bakr AF, Kamel S, Emam SR, El-Banna HA. Maca roots: A potential therapeutic in the management of metabolic disorders through the modulation of metabolic biochemical markers in rats fed high-fat high-carbohydrate diet.

GUT MICROBIOTA-DERIVED INOSINE FROM DIETARY BARLEY LEAF SUPPLEMENTATION ATTENUATES COLITIS THROUGH PPARΓ SIGNALING ACTIVATION

Date & Journal: Microbiome . 2021 Apr 5.

Abstract

Background: Ulcerative colitis is a type of chronic inflammatory bowel disease closely associated with gut microbiota dysbiosis and intestinal homeostasis dysregulation. Barley leaf (BL) has a long history of use in Traditional Chinese Medicine with potential health-promoting effects on intestinal functions. However, its mechanism of action is not yet clear. Here, we explore the potential modulating roles of gut microbial metabolites of BL to protect against colitis and elucidate the underlying molecular mechanisms.

Results: Using 16S rRNA gene-based microbiota analysis, we first found that dietary supplementation of BL ameliorated dextran sulfate sodium (DSS)-induced gut microbiota dysbiosis. The mechanisms by which BL protected against DSS-induced colitis were resulted from improved intestinal mucosal barrier functions via the activation of peroxisome proliferator-activated receptor (PPAR)γ signaling. In addition, metabolomic profiling analysis showed that the gut microbiota modulated BL-induced metabolic reprograming in the colonic tissues particularly by the enhancement of glycolysis process. Notably, dietary BL supplementation resulted in the enrichment of microbiota-derived purine metabolite inosine, which could activate PPARγ signaling in human colon epithelial cells. Furthermore, exogenous treatment of inosine reproduced similar protective effects as BL to protect against DSS-induced colitis through improving adenosine 2A receptor ($A_{2A}R$)/PPARγ-dependent mucosal barrier functions.

Conclusions: Overall, our findings suggest that the gut microbiota-inosine-$A_{2A}R$/PPARγ axis plays an important role in the maintenance of intestinal homeostasis, which may represent a novel approach for colitis prevention via manipulation of the gut microbial purine metabolite.

Li D, Feng Y, Tian M, Ji J, Hu X, Chen F. Gut microbiota-derived inosine from dietary barley leaf supplementation attenuates colitis through PPARγ signaling activation. Microbiome. 2021 Apr 5;9(1):83. doi: 10.1186/s40168-021-01028-7. PMID: 33820558; PMCID

OAT FIBER SUPPLEMENTATION ALLEVIATES INTESTINAL INFLAMMATION AND AMELIORATES INTESTINAL MUCOSAL BARRIER VIA ACTING ON GUT MICROBIOTA-DERIVED METABOLITES IN LDLR $^{-/-}$ MICE

Date & Journal: Nutrition . 2022 Mar.

Abstract

Objective: Gut microbiota-derived metabolites are involved in intestinal inflammation, which can affect the development of atherosclerotic plaques. Previous studies have shown that oat fiber can delay the progression of atherosclerosis via improving lipid metabolism. The aim of this study was to evaluate how oat fiber acted on gut microbiota-derived metabolites, inhibited intestinal inflammation, and protected the intestinal mucosal barrier.

Results: Pathologically, oat fiber reversed the increment of the atherosclerotic lesion and ameliorated intestinal mucosal barrier in LDLR$^{-/-}$ mice. Oat fiber regulated the levels of gut microbiota-derived metabolites along with a decrease in isobutyrylcarnitine, valerylcarnitine, 1-methylguanosine, and 2-methylguanosine, and an increase in l-tyrosine and niacinamide. Notably, oat fiber blocked the TLR4 signal pathway and decreased the expression of nuclear factor-κB p65 in both the aorta and gut tissues. Also, oat fiber raised the expression of tight junction proteins including ZO-1 and occludin.

Conclusion: Taken together, the present study revealed that oat fiber feeding effectively attenuated the development of atherosclerosis, at least partly via affecting gut microbiota-derived metabolites, inhibiting the intestinal inflammatory response, and maintaining the integrity of the intestinal mucosal barrier.

Gao H, Song RJ, Jiang H, Zhang W, Han SF. Oat fiber supplementation alleviates intestinal inflammation and ameliorates intestinal mucosal barrier via acting on gut microbiota-derived metabolites in LDLR-/- mice. Nutrition. 2022 Mar;95:111558. doi: 10.1016

ALGAE SUPPLEMENTATION FOR EXERCISE PERFORMANCE: CURRENT PERSPECTIVES AND FUTURE DIRECTIONS FOR SPIRULINA AND CHLORELLA

Date & Journal: Front Nutr . 2022 Mar 7.

Abstract

Nutritional clinical trials have reported algae such as spirulina and chlorella to have the capability to improve cardiovascular risk factors, anemia, immune function, and arterial stiffness. With positive results being reported in clinical trials, researchers are investigating the potential for algae as an ergogenic aid for athletes. Initial studies found spirulina and chlorella supplementation to increase peak oxygen uptake and time to exhaustion, with the mechanistic focus on the antioxidant capabilities of both algae. However, a number of oxidative stress biomarkers reported in these studies are now considered to lack robustness and have consequently provided equivocal results. Considering the nutrient complexity and density of these commonly found edible algae, there is a need for research to widen the scope of investigation. Most recently algae supplementation has demonstrated ergogenic potential during submaximal and repeated sprint cycling, yet a confirmed primary mechanism behind these improvements is still unclear. In this paper we discuss current algae supplementation studies and purported effects on performance, critically examine the antioxidant and ergogenic differing perspectives, and outline future directions.

Gurney T, Spendiff O. Algae Supplementation for Exercise Performance: Current Perspectives and Future Directions for Spirulina and Chlorella. Front Nutr. 2022 Mar 7;9:865741. doi: 10.3389/fnut.2022.865741. PMID: 35321288; PMCID: PMC8937016.

MACA COULD IMPROVE ENDURANCE CAPACITY POSSIBLY BY INCREASING MITOCHONDRIAL BIOGENESIS PATHWAYS AND ANTIOXIDANT RESPONSE IN EXERCISED RATS

Date & Journal: J Food Biochem . 2022 Mar 29

Abstract

The objective of this study was to shed light on the effect of a novel (Lepidium peruvianum) Maca blend on anti-fatigue capacities in exercised rats. Twenty-eight male albino rats were allocated into four groups (n = 7) at random: (i) Control (vehicle), (ii) Maca: (40 mg/kg/BW), (iii) WL-FST: weight-loaded forced swimming test group, and (iv) WL-FST + Maca group.) Maca supplementation increased swimming time to exhaustion ($p < .01$), while decreasing serum lactate and liver glycogen concentrations. Maca addition resulted in lower levels of serum, liver, and muscle MDA ($p < .05$). Muscle GPx activity increased in both Maca groups ($p < .001$). Moreover, NF-κB levels were less in the WL-FST + Maca compared to the WL-FST group ($p < .001$). Nrf1, Nrf2, PGC-1a, SIRT1, and TFAM levels were augmented in the WL-FST + Maca compared to the WL-FST ($p < .05$). Consequently, our Maca blend increased endurance capacity and prevented exercise-induced oxidative stress and lactic acid buildup.

PRACTICAL APPLICATIONS: Maca (the brassica species Lepidium peruvianum) has been consumed in Peru for centuries to enhance mood, libido, and energy. Although the positive effects of this plant on energy metabolism are accredited, the underlying molecular mechanisms of these effects have not been sufficiently elucidated. The current study's findings suggest that this innovative, exclusive maca powder blend can boost endurance while preventing oxidative stress and lactic acid buildup during acute exercise. The mechanism of this efficacy is thought to be caused by maca's regulatory properties on energy metabolism signaling receptors and strong antioxidant scavenging effects on the free radicals that are produced by prolonged exhaustive exercise periods.

Orhan C, Gencoglu H, Tuzcu M, Sahin N, Ojalvo SP, Sylla S, Komorowski JR, Sahin K. Maca could improve endurance capacity possibly by increasing mitochondrial biogenesis pathways and antioxidant response in exercised rats. J Food Biochem. 2022 Mar 29:e1415

MATCHA TEA POWDER'S ANTIDEPRESSANT-LIKE EFFECT THROUGH THE ACTIVATION OF THE DOPAMINERGIC SYSTEM IN MICE IS DEPENDENT ON SOCIAL ISOLATION STRESS

Date & Journal: Nutrients. 2023 Jan 22

Abstract

Matcha tea powder is believed to have various physiological benefits; however, its detailed mechanism of action has been poorly understood. Here, we investigated whether the mental state of mice, due to social isolation stress, affects the antidepressant-like effect of Matcha tea powder by using the tail suspension test. Oral administration of Matcha tea powder reduced the duration of immobility in the stress-susceptible C57BL/6J strain, but not in BALB/c strain. In C57BL/6J mice, SCH23390, a dopamine D1 receptor blocker, prevented Matcha tea powder from exerting its antidepressant-like effect. Matcha tea powder also increased the number of c-Fos-positive cells in the prefrontal cortex (PFC) region and the nucleus accumbens (NAc) region in C57BL/6J mice, but not in BALB/c mice. In contrast, Matcha tea powder did not change the number of c-Fos-positive cells in the ventral tegmental area (VTA) region. Notably, C57BL/6J mice with a shorter immobility time had a higher number of c-Fos-positive cells in the PFC, NAc, and VTA regions. However, no such correlation was observed in the stress-tolerant BALB/c mice. These results suggest that Matcha tea powder exerts an antidepressant-like effect through the activation of the dopaminergic system including the PFC-NAc-VTA circuit and that mental states are important factors affecting the physiological benefits of Matcha tea powder.

Kurauchi Y, Ohta Y, Matsuda K, Sanematsu W, Devkota HP, Seki T, Katsuki H. Matcha Tea Powder's Antidepressant-like Effect through the Activation of the Dopaminergic System in Mice Is Dependent on Social Isolation Stress. Nutrients. 2023 Jan 22;15(3):581.

EFFECTS OF MATCHA GREEN TEA POWDER ON COGNITIVE FUNCTIONS OF COMMUNITY-DWELLING ELDERLY INDIVIDUALS

Date & Journal: Nutrients . 2020 Nov 26.

Abstract

Matcha Green Tea Powder contains a variety of active ingredients beneficial to health, such as tea catechins, lutein and vitamin K. It is also known that these ingredients confer benefits upon cognitive functions of elderly people. Therefore, we aimed to investigate the relationship between a daily supplementation of Matcha and the change in cognitive functions of community-dwelling elderly people. A randomized, double-blind, placebo-controlled 12-week trial was performed. Sixty-one participants were recruited and randomly assigned to receive test drink containing 3g powder from fresh Matcha or placebo powder per day. Changes in cognitive function were assessed utilizing a psychometric test battery. Daily food intake was assessed by a Brief-type Self-administered Diet History Questionnaire (BDHQ). In the gender-specific analysis, a significant cognitive enhancement was observed in the Montreal Cognitive Assessment (MoCA) score in the active group of women. In dietary analysis, we found a significant inverse correlation between consumption of vitamin K in daily diet, excluding test drinks, and change in MoCA. The present study suggests that daily supplementation of Matcha Green Tea Powder has protective effects against cognitive decline in community-dwelling elderly women.

Sakurai K, Shen C, Ezaki Y, Inamura N, Fukushima Y, Masuoka N, Hisatsune T. Effects of Matcha Green Tea Powder on Cognitive Functions of Community-Dwelling Elderly Individuals. Nutrients. 2020 Nov 26;12(12):3639. doi: 10.3390/nu12123639. PMID: 33256220; P

MATCHA GREEN TEA ALLEVIATES NON-ALCOHOLIC FATTY LIVER DISEASE IN HIGH-FAT DIET-INDUCED OBESE MICE BY REGULATING LIPID METABOLISM AND INFLAMMATORY RESPONSES

Date & Journal: Nutrients . 2021 Jun 6.

Abstract

Lately, matcha green tea has gained popularity as a beverage and food additive. It has proved to be effective in preventing obesity and related metabolic syndromes. However, the underlying mechanisms of its control effects against non-alcoholic fatty liver disease (NAFLD) are complicated and remain elusive. In the present study, we performed an in vivo experiment using male C57BL/6 mice fed with a high-fat diet and simultaneously treated with matcha for six weeks. Serum biochemical parameters, histological changes, lipid accumulation, inflammatory cytokines, and relevant indicators were examined. Dietary supplementation of matcha effectively prevented excessive accumulation of visceral and hepatic lipid, elevated blood glucose, dyslipidemia, abnormal liver function, and steatosis hepatitis. RNA sequencing analyses of differentially expressed genes in liver samples indicated that matcha treatment decreased the activity of lipid droplet-associated proteins and increased the activity of cytochrome P450 enzymes, suggesting improved metabolic capacity and liver function. The current study provided evidence for new dietary strategies based on matcha supplementation to ameliorate lipotoxicity-induced obesity and NALFD.

Zhou J, Yu Y, Ding L, Xu P, Wang Y. Matcha Green Tea Alleviates Non-Alcoholic Fatty Liver Disease in High-Fat Diet-Induced Obese Mice by Regulating Lipid Metabolism and Inflammatory Responses. Nutrients. 2021 Jun 6;13(6):1950. doi: 10.3390/nu13061950. PMI

EFFICACY OF WITHANIA SOMNIFERA (ASHWAGANDHA) SUPPLEMENTATION ON ADULT'S COGNITION AND MOOD

Date & Journal: Journal Ayurveda Integrative Medicine. 2021 Nov 25.

Abstract

The present study examined the effects of a proprietary Ashwagandha (Withania somnifera) root and leaf extract (NooGandha® Specnova LLC, USA) supplement for improving cognitive abilities, cortisol levels, and self-reported mood, stress, food cravings, and anxiety with adults who have perceived stress. Healthy adults (n = 43 women and n = 17 men; mean age = 34.41 years) who reported experiencing perceived stress were randomized to the following groups: Ashwagandha (400 mg/d), Ashwagandha (225 mg/d), and placebo for 30 days. The following outcomes were assessed at Day 0, Day 15, and Day 30: saliva cortisol levels, cognitive performance (i.e., CNS vital signs), and the self-reported measures of Trait Anxiety Inventory, Depression Anxiety Stress Scale, Perceived Stress Scale, and Food Cravings Questionnaire-15. For the self-report assessments, significant main effects for time were evidenced for anxiety, depression, perceived stress, and food cravings, p's < 0.01. The main effect for group and the interactions were non-significant. For the CNS vital signs, significant differences were observed in cognitive flexibility, visual memory, reaction time, psychomotor speed, and executive functioning, p's < 0.05, with the Ashwagandha groups often out-performing the placebo group. Both Ashwagandha groups had reductions in cortisol levels over time, with significant reductions evidenced for the Ashwagandha 225 mg/d group from Day 0 to Day 15 to Day 30. The placebo group had a non-significant increase in cortisol levels from Day 0 to Day 15-30. No adverse events were reported. In conclusion, Ashwagandha supplementation may improve the physiological, cognitive, and psychological effects of stress.

Remenapp A, Coyle K, Orange T, Lynch T, Hooper D, Hooper S, Conway K, Hausenblas HA. Efficacy of Withania somnifera supplementation on adult's cognition and mood. J Ayurveda Integr Med. 2021 Nov 25;13(2):100510. doi: 10.1016/j.jaim.2021.08.003. Epub ahead

NOPAL FIBER (OPUNTIA FICUS-INDICA) IMPROVES SYMPTOMS IN IRRITABLE BOWEL SYNDROME IN THE SHORT TERM: A RANDOMIZED CONTROLLED TRIAL

Date & Journal: Neurogastroenterol Motil . 2021 Feb.

Abstract

Background: Clinical guidelines provide limited and conflicting recommendations regarding dietary fiber supplementation in irritable bowel syndrome (IBS). Nopal (Opuntia ficus-indica) is a cactus plant fiber containing both insoluble and soluble fibers that may have therapeutic potential in IBS. Our aim was to evaluate the dose-response effect of extracted nopal fiber powder on symptoms in IBS.

Methods: We performed a 4-arm, double-blind, parallel, randomized controlled trial in 60 patients fulfilling Rome IV criteria for IBS. Patients were randomized and blindly allocated to receive either nopal fiber (10, 20, or 30 g/day) or placebo (30 g/day dextrose) for one week and to keep their usual diet. Symptom severity (Global Symptom Question, IBS-SSS, Gastrointestinal Symptom Rating Scale), stool frequency and consistency (Bristol Stool Form Scale), breath hydrogen response, and stool short-chain fatty acids (SCFA) were measured at baseline and follow-up.

Conclusions and inferences: Nopal fiber supplementation at doses of 20 and 30 g/day was associated with short-term improvement in IBS symptoms, warranting a fully powered clinical trial of longer duration with symptomatic, physiological, and microbiological endpoints.

Remes-Troche JM, Taboada-Liceaga H, Gill S, Amieva-Balmori M, Rossi M, Hernández-Ramírez G, García-Mazcorro JF, Whelan K. Nopal fiber (Opuntia ficus-indica) improves symptoms in irritable bowel syndrome in the short term: a randomized controlled trial. Ne

EFFECT OF FENUGREEK SUPPLEMENTATION ON BLOOD LIPIDS AND BODY WEIGHT: A SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CONTROLLED TRIALS

Date & Journal: J Ethnopharmacol . 2020 May 10

Abstract:

Ethnopharmacological relevance: Fenugreek is a traditional herbal medicine that has been used for centuries to treat hyperglycemia, muscle spasms, gastritis, constipation, edema, and other metabolic disorders. Recently, lipid-lowering effects of fenugreek have been identified.

Aim of the study: The aim of this systematic review and meta-analysis was to determine and clarify the impact of fenugreek supplementation on anthropometric indices and serum lipid levels.

Conclusion: Fenugreek supplementation improved lipid parameters in adults. However, to confirm these results, more studies, particularly among hyperlipidemic patients, are needed.

Askarpour M, Alami F, Campbell MS, Venkatakrishnan K, Hadi A, Ghaedi E. Effect of fenugreek supplementation on blood lipids and body weight: A systematic review and meta-analysis of randomized controlled trials. J Ethnopharmacol. 2020 May 10;253:112538. doi: 10.1016/j.jep.2019.112538. Epub 2020 Feb 20. PMID: 32087319.

A RANDOMIZED CLINICAL TRIAL OF THE EFFECTS OF LEAFY GREEN VEGETABLES AND INORGANIC NITRATE ON BLOOD PRESSURE

Date & Journal: Am J Clin Nutr . 2020 Apr.

Background: A diet rich in fruits and vegetables is associated with lowering of blood pressure (BP), but the nutrient(s) responsible for these effects remain unclear. Research suggests that inorganic nitrate present in leafy green vegetables is converted into NO in vivo to improve cardiovascular function.

Conclusions: A 5-wk dietary supplementation with leafy green vegetables or pills containing the same amount of inorganic nitrate does not decrease ambulatory SBP in subjects with elevated BP. This trial was registered at clinicaltrials.gov as NCT02916615.

Sundqvist ML, Larsen FJ, Carlström M, et al. A randomized clinical trial of the effects of leafy green vegetables and inorganic nitrate on blood pressure. Am J Clin Nutr. 2020;111(4):749-756. doi:10.1093/ajcn/nqaa024

IMPACT OF A PROBIOTIC PRODUCT ON BOWEL HABITS AND MICROBIAL PROFILE IN PARTICIPANTS WITH FUNCTIONAL CONSTIPATION: A RANDOMIZED CONTROLLED TRIAL

Date & Journal: J Dig Dis . 2019 Sept. 20.

Abstract

Objective: To investigate the clinical efficacy of a multi-strain probiotic product on bowel habits and microbial profile in participants with functional constipation.

Conclusions: No significant differences were observed in symptomology, with both groups showing a more than 20% improvement. However, the probiotic helped modulate bowel function earlier than the placebo, with a corresponding shift to a more fibrolytic microbiota.

Martoni CJ, Evans M, Chow CT, Chan LS, Leyer G. Impact of a probiotic product on bowel habits and microbial profile in participants with functional constipation: A randomized controlled trial. J Dig Dis. 2019;20(9):435-446. doi:10.1111/1751-2980.12797

THE CHEMICAL COMPOSITION AND NUTRITIONAL VALUE OF CHIA SEEDS-CURRENT STATE OF KNOWLEDGE

Date & Journal: Nutrients . 2019 May 31

Abstract

Chia (Salvia hispanica) is an annual herbaceous plant, the seeds of which were consumed already thousands of years ago. Current research results indicate a high nutritive value for chia seeds and confirm their extensive health-promoting properties. Research indicates that components of chia seeds are ascribed a beneficial effect on the improvement of the blood lipid profile, through their hypotensive, hypoglycaemic, antimicrobial and immunostimulatory effects. This article provides a review of the most important information concerning the potential application of chia seeds in food production. The chemical composition of chia seeds is presented and the effect of their consumption on human health is discussed. Technological properties of chia seeds are shown and current legal regulations concerning their potential use in the food industry are presented.

Kulczyński B, Kobus-Cisowska J, Taczanowski M, Kmiecik D, Gramza-Michałowska A. The Chemical Composition and Nutritional Value of Chia Seeds-Current State of Knowledge. Nutrients. 2019;11(6):1242. Published 2019 May 31. doi:10.3390/nu11061242

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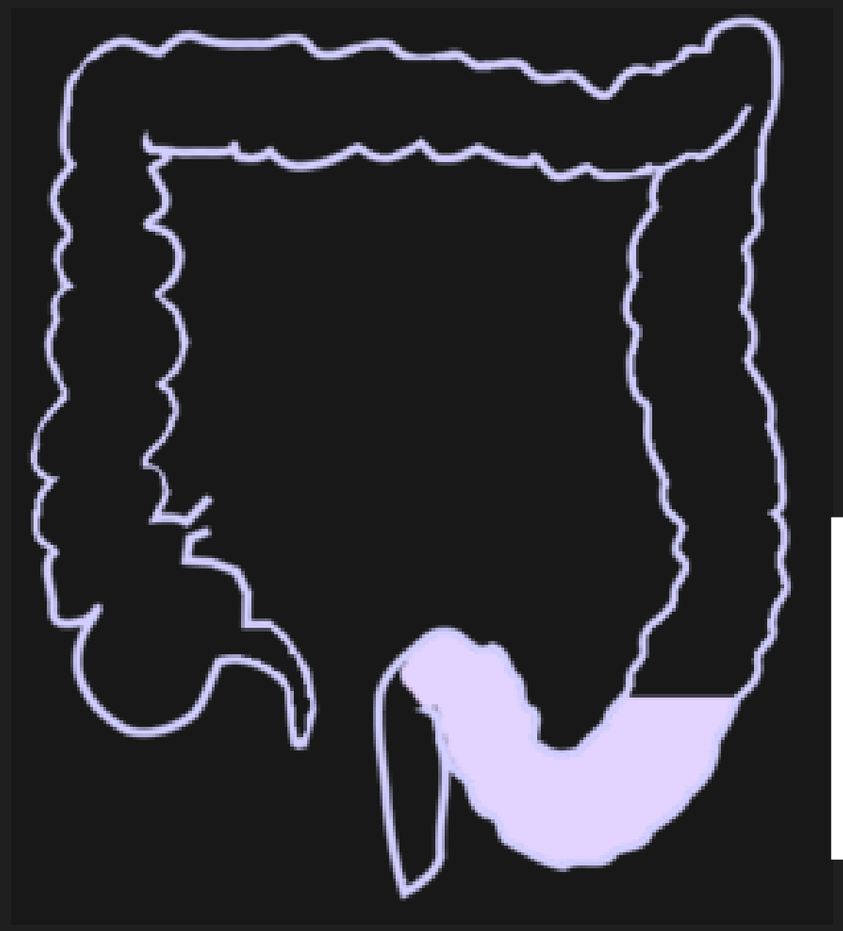

COLON HEALTH

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COLON CLEANSING:
WHY THE NEED?

- ***We kill our friendly bacteria from an acidic diet.***

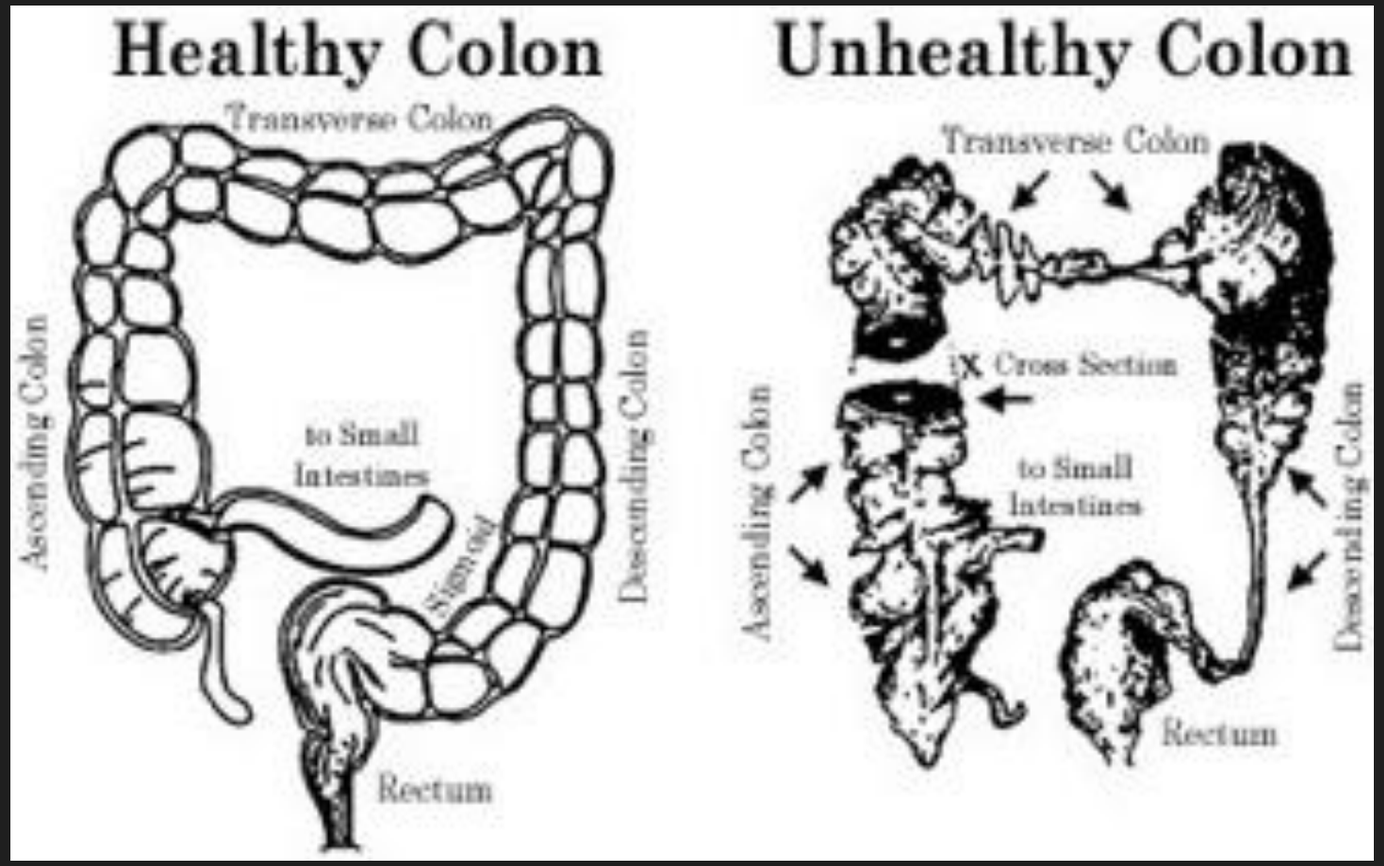
- ***Acidification of the body decreases enzyme production.***

- ***Mucoid plaque from rotting food in the intestinal lining halts peristalsis.***

TRANSIT TIME = 3 MEALS ONLY

- Transit time: We're only supposed to store three meals before a meal comes out (Jensen), but most Americans store nine, twelve, or even more.

- This increased transit time is irritating to the intestinal lining. We absorb less and less nutrients as we lose more and more water & minerals.



FLAXSEED BIOACTIVE COMPOUNDS AND COLORECTAL CANCER PREVENTION

Date & Journal: Curr Oncol Rep . 2018 Jun 5.

Abstract

Purpose of review: Flaxseed and its bioactive components have been associated with a decreased risk of colorectal cancer incidence and progression. This review aims to summarize recent research regarding the role of flaxseed and each of its major dietary bioactive components in reducing colorectal cancer.

Recent findings: In both human and animal model experiments, flaxseed consumption had beneficial effects on colon physiology associated with reduction in colorectal cancer risk or occurrence. Considered separately, each of flaxseed's major bioactive components, including fiber, alpha-linolenic acid, lignans, and other phytochemicals, is also associated with decreased risk of colonic neoplasms and regulation of cell growth through several potential mechanisms. Collectively, experimental data suggests that consumption of flaxseed and/or its bioactive components may reduce colorectal cancer risk by a variety of mechanisms. Future studies should focus on the mechanisms by which whole flaxseed can prevent colorectal cancer.

DeLuca JAA, Garcia-Villatoro EL, Allred CD. Flaxseed Bioactive Compounds and Colorectal Cancer Prevention. Curr Oncol Rep. 2018;20(8):59. Published 2018 Jun 5. doi:10.1007/s11912-018-0704-z

The colon revisited or the key to wellness, health and disease!

Date & Journal: Med Hypotheses. 2017 Oct.

Abstract:

The hypothesis being advanced in this paper is that there is a new medical paradigm emerging from the biomedical research carried out in this century, mainly due to the explosion of the so called "omics" and associated techniques. The main idea is that there is a common pathway from wellbeing and health to chronic **disease** ("chronopathy") and even to death, which comprises following steps: 1) unhealthy diet, sedentary life style, permanent exposition to xenobiotics & all kinds of noxious stimuli; 2) intestinal dysbiosis;3) alteration of the intestinal mucus layer (especially the **colon**); 4) disruption of the endothelial tight junctions;5) metabolic endotoxemia+bacterial translocation; 6) inflammation; 7) exacerbation of the enteric nervous system (ENS) & consequent maladaptation/malfunctioning of the **colon**; 8) epigenetic manifestations; 9) "chronopathy" and premature death. In order to maintain a good health or to improve or even reverse chronic diseases in a person, the main outcome to look for is a homeostatic balance of the intestinal microbiota (eubiosis), most of which is located in the **colon**.

… Bacteria do not rely on other living beings for their existence, while the latter depend completely on the former. Humans are no exemption, and new evidence emerges each day about the pivotal role of intestinal microbiota in human health, **disease** and, in general, in its wellbeing. The following facts about intestinal microbiota are nowadays generally accepted: there are about 10 times more bacteria in the gut than human cells in every human being; the microbioma is about 100150 times bigger that the human genome, and there is a clear link between intestinal microbiota and many of the most common chronic diseases, from obesity and diabetes to depression and Parkinson **disease** and different kinds of cancer.

The main implication of this theory is that … we ought to be more conscious of our intestinal microbiota, take care of it and monitor it permanently. Thus, as part of our good life habits (healthy eating, physical exercise), we should probably undergo periodic seasons of fasting and **colon** cleansing, as it was common in older times.

Gonzalez-Correa CA, Mulett-Vásquez E, Miranda DA, Gonzalez-Correa CH, Gómez-Buitrago PA. The colon revisited or the key to wellness, health and disease. Med Hypotheses. 2017 Oct;108:133-143. doi: 10.1016/j.mehy.2017.07.032. Epub 2017 Jul 29. PMID: 29055387.e

Diverticulitis: An Update From the Age Old Paradigm

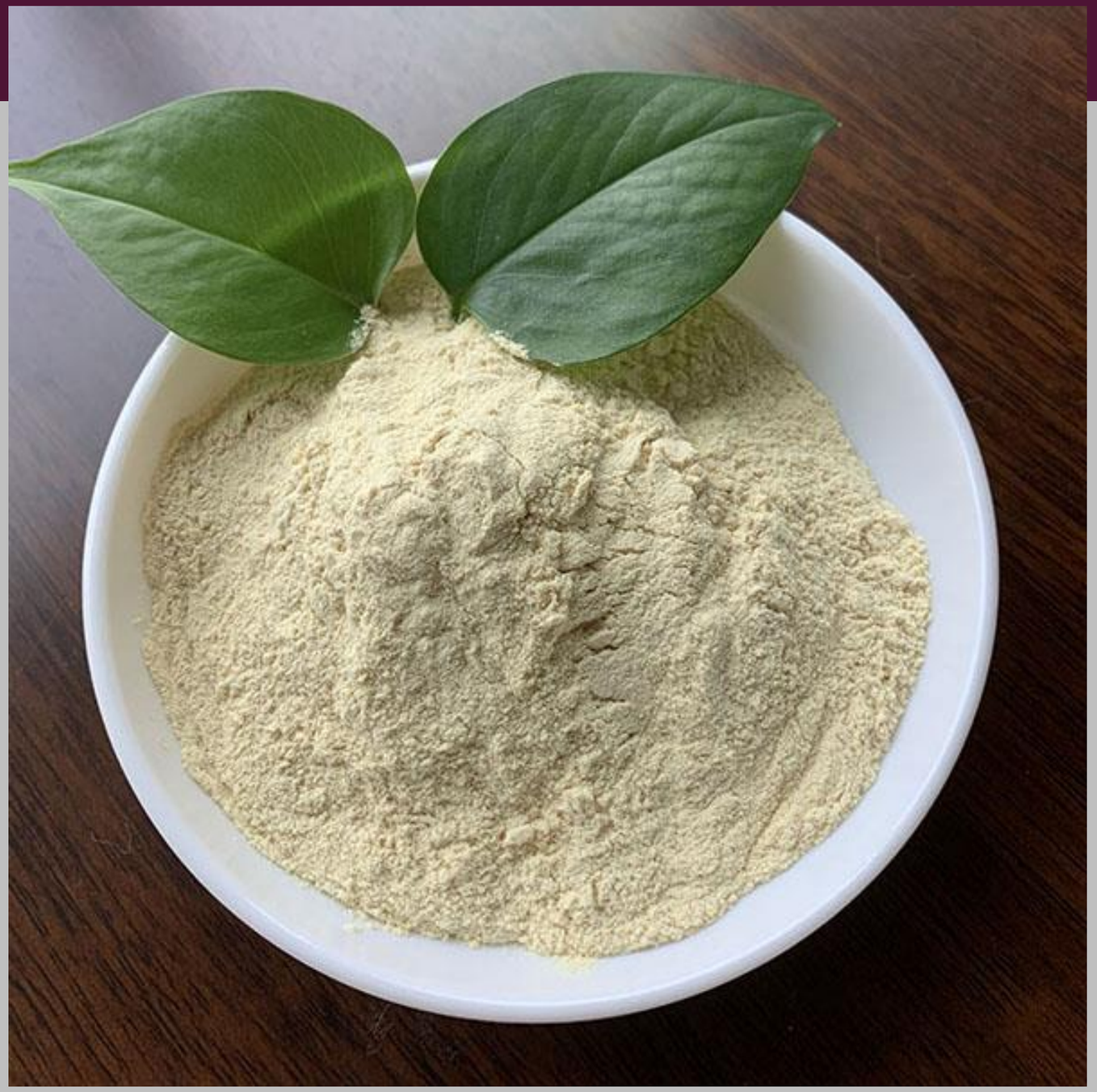
Curr Probl Surg . 2020 Oct

Abstract: For a disease process that affects so many, we continue to struggle to define optimal care for patients with diverticular disease. Part of this stems from the fact that diverticular disease requires different treatment strategies across the natural history- acute, chronic and recurrent.

Diverticular disease was rarely described in the literature prior to the 1900's. In the late 1960's and early 1970's, Painter and Burkitt popularized the theory that diverticulosis is a disease of Western civilization based on the observation that diverticulosis was rare in rural Africa but common in economically developed countries. Previous surgical guidelines focused on early operative intervention to avoid potential complicated episodes of recurrent complicated diverticulitis (e.g., with free perforation) that might necessitate emergent surgery and stoma formation. More recent data has challenged prior concerns about decreasing effectiveness of medical management with repeat episodes and the notion that the natural history of diverticulitis is progressive. It has also permitted more accurate grading of the severity of disease and permitted less invasive management options to attempt conversion of urgent operations into the elective setting, or even avoid an operation altogether. The role of diet in preventing diverticular disease has long been debated. A high fiber diet appears to decrease the likelihood of symptomatic diverticulitis. The myth of avoid eating nuts, corn, popcorn, and seeds to prevent episodes of diverticulitis has been debunked with modern data. Overall, the recommendations for "diverticulitis diets" mirror those made for overall healthy lifestyle – high fiber, with a focus on whole grains, fruits and vegetables.

Diverticulosis is one of the most common incidental findings on colonoscopy and the eighth most common outpatient diagnosis in the United States. Over 50% of people over the age of 60 and over 60% of people over age 80 have colonic diverticula. Of those with diverticulosis, the lifetime risk of developing diverticulitis is estimated at 10–25%, although more recent studies estimate a 5% rate of progression to diverticulitis. Diverticulitis accounts for an estimated 371,000 emergency department visits and 200,000 inpatient admissions per year with annual cost of 2.1–2.6 billion dollars per year in the United States. The estimated total medical expenditure (inpatient and outpatient) for diverticulosis and diverticulitis in 2015 was over 5.4 billion dollars. The incidence of diverticulitis is increasing.

MINERALS & COLLAGEN RESEARCH



FUNCTIONS OF MINERALS

Structural: bones, teeth, ligaments

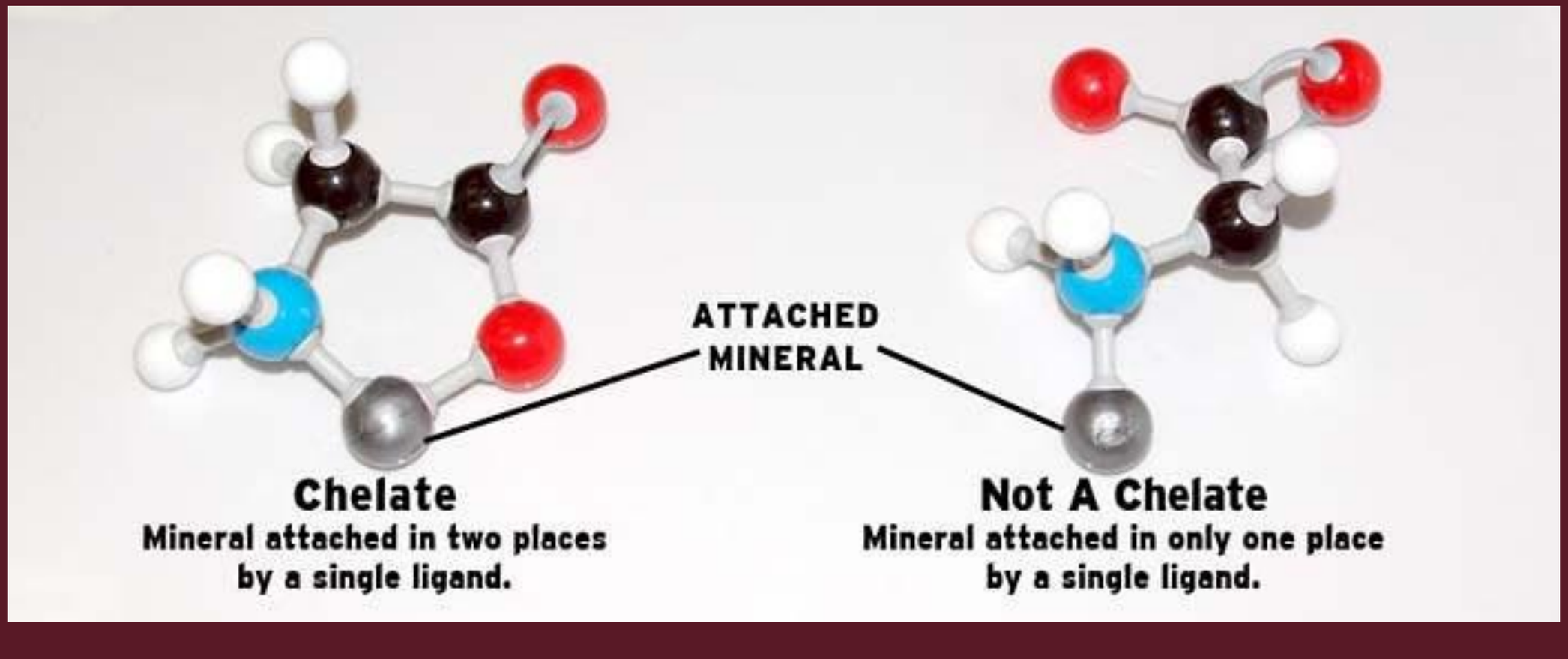
Solutes and electrolytes in the blood

Nerve transmission

Muscle action

Enzyme actions

BEST TYPE OF MINERAL SUPPLEMENTS



- CHELATED = a mineral is bound or stuck to certain carrier molecules or amino acid which result increased absorption
  - Chelation can include minerals, vitamins, or enzymes. Minerals in food may be bound with organic molecules already in a chelated state.
  - Albion Labs - TRAACS – "The Real Amino Acid Chelate System"
  - Chelation Therapy = treatment for removing heavy metals from the blood. The toxic metals are bound to a therapeutic amino acid ligand called EDTA.

ALBION AMINO ACID CHELATE ABSORPTION

A SHORT VIDEO

THE SYNERGISTIC EFFECTS OF FOUR MEDICINAL PLANT SEEDS AND CHELATED MINERALS ON THE GROWTH, IMMUNITY, AND ANTIOXIDANT CAPACITY OF RAINBOW TROUT (ONCORHYNCHUS MYKISS)

Date & Journal: Fish Shellfish Immunol. 2023 Aug

Abstract

Trace minerals are essential for the normal functioning of all living organisms. In addition, the positive effects of several medicinal plants have been demonstrated in aquaculture. In the present study, we aimed to investigate the effects of a mixture of medicinal plants and test the synergistic effects of medicinal plants and chelated minerals on fish growth and immunity. Thus, in the present experiment we evaluated the combined effects of a commercial chelated mineral source (BonzaFish®) and a mixture of 4 medicinal plants including caraway (Carum carvi), green cumin (Cuminum cyminum), dill (Anethum graveolens), and anise (Pimpinella anisum). Rainbow trout (Oncorhynchus mykiss) fingerlings (n = 225) were fed with five formulated diets, including a control diet (basal diet), Bonza (basal diet + 1 g/kg BonzaFish®), Z-5 (basal diet + 1 g/kg BonzaFish® + 5 g/kg mixture of plant seeds), Z-10 (basal diet + 1 g/kg BonzaFish®+10 g/kg mixture of plant seeds), Z-20 (basal diet+1 g/kg BonzaFish®+20 g/kg mixture of plant seeds) for 6 weeks. In diets including BonzaFish®, 50% of the inorganic mineral premix was replaced by BonzaFish®. Results revealed that fish receiving the Z-20 diet showed the best performance in terms of growth parameters, followed by the Bonza treatment ($P < 0.05$). The highest protease activity was found in Z-5 and Z-10. RBCs were highest in Z-5, while the highest WBCs and hemoglobin were found in the Bonza treatment followed by Z-20. Stress biomarkers were lowest in the Z-20 treatment. Results showed that Z-20 could elicit the most robust immunological responses of lysozyme activity, ACH50, total Ig, C3, and C4. In conclusion, chelated minerals could be successfully used to replace 50% of mineral premix with no negative impacts on fish growth and together with four medicinal plants, could enhance rainbow trout overall growth performance and immunity.

Rashidian G, Zare M, Tabibi H, Stejskal V, Faggio C. The synergistic effects of four medicinal plant seeds and chelated minerals on the growth, immunity, and antioxidant capacity of rainbow trout (Oncorhynchus mykiss). Fish Shellfish Immunol. 2023 Aug;139

SELENIUM CONCENTRATION IS ASSOCIATED WITH OCCURRENCE AND DIAGNOSIS OF THREE CARDIOVASCULAR DISEASES: A SYSTEMATIC REVIEW AND META-ANALYSIS

Date & Journal: J Trace Elem Med Biol . 2022 Mar.

Abstract

Background: Selenium (Se) is a vital trace element playing its biological functions through selenoprotein, which has been implicated in various physiological and pathological processes. A growing number of studies indicate that low Se increases the risk of cardiovascular diseases (CVDs). This meta-analysis aimed to compare and analyze differences in Se levels between patients with heart failure (HF), myocardial infarction (MI), coronary heart disease (CHD), and healthy people. This will provide ideas with the potential to improve clinical intervention and prevention of CVDs.

Results: A total of 49 eligible studies (including 61 cohorts) were obtained. Results of the meta-analysis showed that there was a significant difference in Se levels between HF, MI, CHD patients and healthy people. Analysis of the correlation between Se level and publication year showed that SMD of Se levels in HF and controls was positively correlated with time. Se level was found to be a good diagnostic marker of MI (AUC = 0.7107, P = 0.0167, Sensitivity = 77.27 %, Specificity = 72.73 %).

Conclusions: This meta-analysis shows that Se levels in patients with HF, MI, and CHD are generally lower compared with healthy controls. However, due to the small number of included studies, further studies are needed to confirm the present results.

Yang L, Qi M, Du X, Xia Z, Fu G, Chen X, Liu Q, Sun N, Shi C, Zhang R. Selenium concentration is associated with occurrence and diagnosis of three cardiovascular diseases: A systematic review and meta-analysis. J Trace Elem Med Biol. 2022 Mar;70:126908. d

ASSOCIATION OF SELENIUM, ZINC AND COPPER CONCENTRATIONS DURING PREGNANCY WITH BIRTH WEIGHT: A SYSTEMATIC REVIEW AND META-ANALYSIS

Date & Journal: J Trace Elem Med Biol . 2022 Jan

Abstract

Background: Normal fetal growth is associated with maternal nutrition. Trace elements play important roles in fetus growth. This review aims to provide a summary of the literature evaluating the relation between selenium, zinc and copper levels during pregnancy with birth weight.

Result: Significant differences were found between pooled standardized mean differences (SMD) of umbilical cord blood copper levels in small-for-gestational age birth weight (SGA) and appropriate-for-gestational age birth weight (AGA) (SMD: 0.34 μg/L, 95 % CI: 0.13 to 0.56). There was a significant pooled correlation between umbilical cord blood selenium concentrations and birth weight (r: 0.08, 95 % CI: 0.01 to 0.16). A significant pooled correlation was found between umbilical cord blood zinc concentrations and birth weight (r: 0.09, 95 % CI: 0.04 to 0.15), with significant heterogeneity (I^2 % = 0.63). There was significant positive association between maternal blood zinc concentrations and birth weight.

Conclusion: Findings showed the association of trace elements including selenium, zinc and copper during pregnancy with birth weight. There was significant correlation between umbilical cord and maternal blood selenium and zinc levels with birth weight. The umbilical cord blood copper levels in SGA birth weight was higher than copper levels in AGA birth weight.

Atazadegan MA, Heidari-Beni M, Riahi R, Kelishadi R. Association of selenium, zinc and copper concentrations during pregnancy with birth weight: A systematic review and meta-analysis. J Trace Elem Med Biol. 2022 Jan;69:126903. doi: 10.1016/j.jtemb.2021.12

DO MULTIVITAMIN/MINERAL DIETARY SUPPLEMENTS FOR YOUNG CHILDREN FILL CRITICAL NUTRIENT GAPS?

Date & Journal: J Acad Nutr Diet . 2022 Mar.

Abstract

●**Background:** Nearly a third of young US children take multivitamin/mineral (MVM) dietary supplements, yet it is unclear how formulations compare with requirements.

●**Objective:** Describe the number and amounts of micronutrients contained in MVMs for young children and compare suggested amounts on product labels to micronutrient requirements.

●**Results:** The 288 MVMs contained a mean of 10.1 ± 2.27 vitamins and 4.59 ± 2.27 minerals. The most common were, in rank order, vitamins C, A, D, E, B_6, B_{12}; zinc, biotin, pantothenic acid, iodine, and folic acid. For micronutrients denoted by the DGA 2015 and DGA 2020 of public health concern, 56% of the 281 products containing vitamin D, 4% of the 144 with calcium, and none of the 60 containing potassium provided at least half of the DV. The upper tolerable intake level was exceeded by 49% of 197 products with folic acid, 17% of 283 with vitamin A, and 14% of 264 with zinc. Most MVMs contained many of 16 other vitamins and minerals identified in national surveys as already abundant in children's diets.

●**Conclusions:** A reexamination of the amounts and types of micronutrients in MVMs might consider formulations that better fill critical gaps in intakes and avoid excess.

Dwyer JT, Saldanha LG, Bailen RA, Gahche JJ, Potischman N, Bailey RL, Jun S, Long Y, Connor E, Andrews KW, Pehrsson PR, Gusev PA. Do Multivitamin/Mineral Dietary Supplements for Young Children Fill Critical Nutrient Gaps? J Acad Nutr Diet. 2022 Mar;122(3)

IMPACT OF MAGNESIUM ON BONE HEALTH IN OLDER ADULTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Date & Journal: Bone . 2022 Jan.

Abstract

●**Background:** Magnesium plays a key role in bone health and may, therefore, represent an interesting nutrient for the prevention of bone loss and osteoporosis. The aim of this systematic review and meta-analysis was to investigate the impact of magnesium intake from any source on bone mineral density (BMD), bone mineral content (BMC), bone turnover markers, and fracture risk in older adults.

●**Results:** Once 787 records were screened, six cohort studies, one case-control study and five cross-sectional studies were included. Qualitative evaluation demonstrated a positive trend between higher magnesium intake and higher hip and femoral neck BMD. Meta-analysis of four studies showed a significant positive association between magnesium intake and hip BMD (pooled beta: 0.03, 95% CI: 0.01-0.06, $p < 0.05$).

●**Conclusions:** This systematic review indicates that a higher magnesium intake may support an increase in hip and femoral neck BMD. Due to limited research no associations with BMD at other sites or fractures were found. There is a need for properly designed cohort studies to determine the association between magnesium intake and bone health in older adults. Next, large and long-term randomized controlled trials in older adults are needed to determine whether an increase in magnesium (supplementation) intake can improve bone health. The combination of several bone nutrients (calcium, vitamin D, protein, magnesium and potentially more) may be needed for the most optimal effect on bone health and to delay or prevent the development of osteoporosis.

Groenendijk I, van Delft M, Versloot P, van Loon LJC, de Groot LCPGM. Impact of magnesium on bone health in older adults: A systematic review and meta-analysis. Bone. 2022 Jan;154:116233. doi: 10.1016/j.bone.2021.116233. Epub 2021 Oct 16. PMID: 34666201.

Nutritional option that I use in my practice for muscle cramping & bone loss prevention

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ABSOLUTELY PURE®

CHELATED MINERALS

ALL-NATURAL AID TO HELP PREVENT BONE LOSS & MUSCLE CRAMPING

90 VEGGIE CAPSULES

MADE IN USA

" A dietary supplement"

Supplement Facts

Suggested Dosage: Up to 3 capsules per day or as recommended by your healthcare provider.

Servings per container: 30
Serving Size: 3 capsules

Ingredient	Amount Per Serving	% Daily Value
Calcium Bisglycinate Chelate TRAACS®	600mg	60%
Magnesium Bisglycinate Chelate TRAACS®	500mg	125%
Potassium Glycinate complex TRAACS®	300mg	6%
Calci-K® (Calcium Potassium Phosphate Citrate)TRAACS®	50mg	1%
Ferrochel® (Ferrous Bisglycinate Chelate)TRAACS®	5mg	2%
Vitamin D3 (Cholecalciferol)	400 IU	100%
Sodium (as bicarbonate)	100 mg	4%
Zinc Bisglycinate Chelate TRAACS®	15mg	136%

A proprietary blend of 500 mg of the following natural ingredients: Raspberry Leaf extract 4:1; Corydalis; Organic Wild Yam; Cramp Bark; Organic Ginger root. Bioavailable naturally occurring minerals: Calcium; Magnesium; Potassium; Manganese; Copper; Iron; Zinc; Vitamins A, C, & E; Vitamin B complex.
Other Ingredients: Glucose; Silicon dioxide; Vegetable capsule.
Made with organic ingredients when possible.

Distributed by:
Organiccs Absolutely Pure, LLC
Laguna Hills, CA. 92653
(949) 707-5785
USP Inc. Facility Code 20181

Lot:

Exp:

Manufactured by PHS Oxnard CA

WHAT IS COLLAGEN PROTEIN?

- Largest Protein in our body. 70% of our total protein.

- Collagen Protein make up heart, lungs, blood vessels, discs, muscle, bone, internal organs.

- Ptosis = loss of collagen, droopy organs and skin.

  Caused by hormonal changes, drugs, alcohol, processed foods, white sugar, hydrogenated oils, fluoridated water, dehydration, stress, and trauma.

Collagen is concentrated in the **extracellular matrix (ECM)**, a network that supports the cells of every single tissue in your body.

By dry weight, collagen makes up:

90% of the sclera (white part of your eye)

80% of tendons

70-80% of the skin

60% of cartilage

30% of bones

1–10% of muscle mass

COLLAGEN TYPES USED IN NUTRITIONAL PRODUCTS FOR PAIN MANAGEMENT & INFLAMMATION REDUCTION

SEVERAL DIFFERENT TYPES OF PROTEIN HAVE BEEN IDENTIFIED, BUT MOST OF THE COLLAGEN IN THE BODY IS TYPE I, II, OR III.

TYPE I – Most Common. In the bones, teeth, ligaments, & tendons. Also present in skin and is responsible for the skin's elasticity & strength. Loss of Type 1 Collagen results in wrinkles & aged appearance.

Source: Hides of Organic Grass Fed Cows

TYPE II – Found in the cartilage.

Source: Feet of GMO Fed Chickens or Hooves of GMO Fed Cows

TYPE III - Most prevalent in skin, blood vessels, and internal organs.

Source: Feet of Caged, GMO Fed Chickens

León-López, Arely et al. "Hydrolyzed Collagen-Sources and Applications." *Molecules (Basel, Switzerland)* vol. 24,22 4031. 7 Nov. 2019, doi:10.3390/molecules24224031

WHY HYDROLYZED COLLAGEN TYPE 1 ?

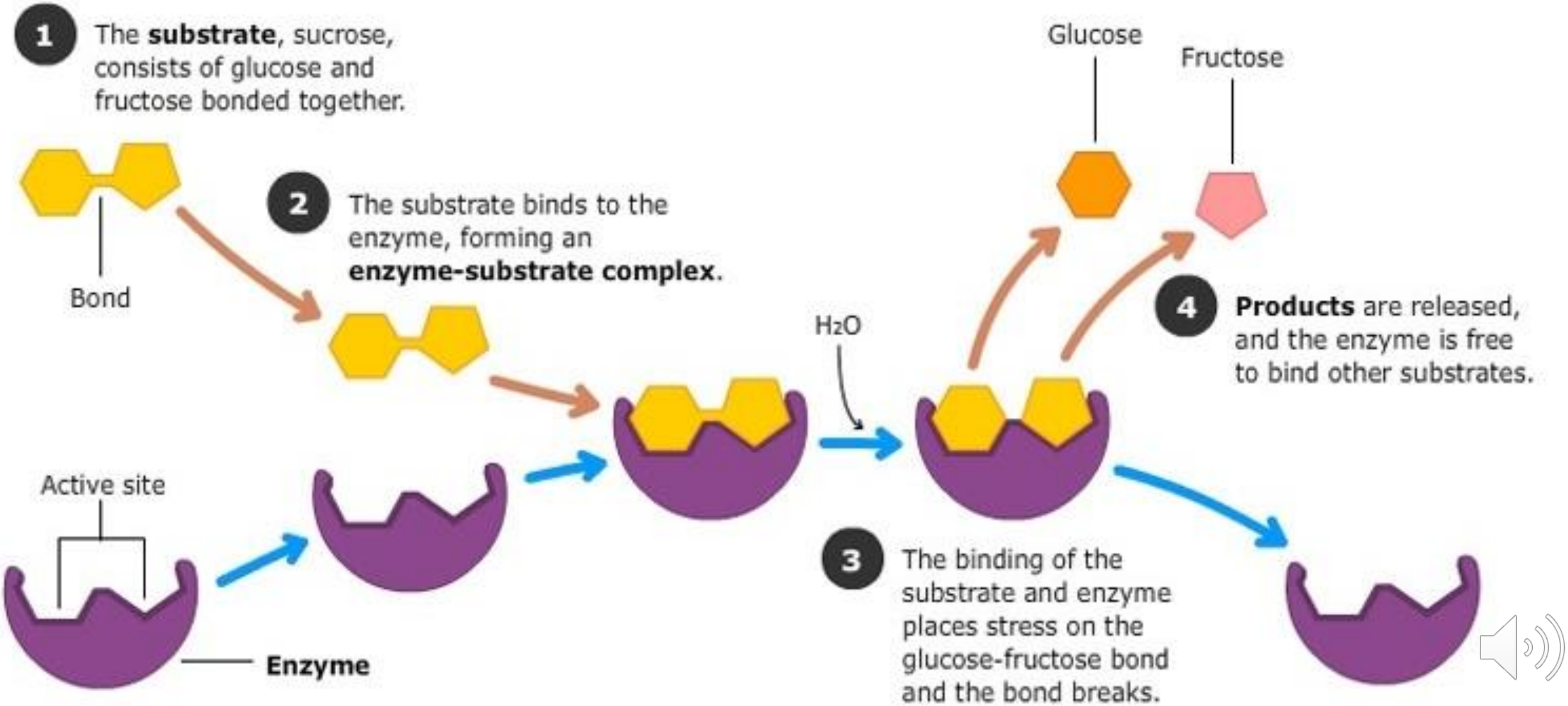
- The body can’t absorb collagen in whole form.
- This protein must be broken down during the digestive process before it can be absorbed.
- To increase bioavailability, we use *Hydrolyzed* collagen
  - Collagens long amino acid chain is broken down into peptides
  - Resulting in a much easier absorption process in the GI tract.
  - Capsules are better for this digestion process than powder due to the lack of clumping.

León-López, Arely et al. “Hydrolyzed Collagen-Sources and Applications.” *Molecules (Basel, Switzerland)* vol. 24,22 4031. 7 Nov. 2019, doi:10.3390/molecules24224031

PROCESS OF ENZYMATIC HYDROLYSIS

Definition: Catalytic decomposition of a chemical compound by reaction with water.

In supplements it is used for the breakdown of proteins into amino acids by the addition of the enzyme protease.



HYDROLYZED COLLAGEN TYPE 1

Results of Clinical Studies Suggest:

- Increase of lean muscle, muscle tone, skin tone, joint rebuilding, stronger arteries, increased energy, and organ rebuilding.

Long Term Improvements Suggest:

- Reduction in: Osteoporosis, high blood pressure, arthritis, weak bladder, obesity, chronic fatigue, and autoimmune diseases.

Nutritional option that I use in my practice for Rehabilitation of Injuries, and Muscle & Tissue Strengthening.

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ABSOLUTELY PURE®

TYPE-1 COLLAGEN PROTEIN

ALL-NATURAL AID FOR STRENGTHENING HAIR, SKIN, NAILS, MUSCLES & JOINTS

180 VEGGIE CAPSULES

MADE IN USA

" A dietary supplement"

Supplement Facts

Suggested Dosage: Up to 6 capsules per day or as recommend by your healthcare provider.

Servings per container: 30
Serving Size: 6 capsules

Ingredient	Amount Per Serving	% Daily Value
Type 1 Hydrolyzed Collagen Kosher(Bovine)	3000 mg	120%
Vitamin C (Ascorbic Acid)	200 mg	333%

A proprietary blend of 320 mg of the following natural ingredients:
Glucosamine sulfate; Horsetail herb; Citrus Bioflavonoids. Made with organic ingredients when possible.

Other ingredients: Vegetable capsule.

Distributed by:
Organiccs Absolutely Pure, LLC
Laguna Hills, CA. 92653
(949) 707-5785
USP Inc. Facility Code 20181

Lot:
Exp:

Manufactured by PHS Oxnard CA

COLLAGEN STUDY ADVANCES FOR PHOTOAGING SKIN

Date & Journal: Photodermatol Photoimmunol Photomed. 2024 Jan

Abstract

Background: Collagen dominates the skin's extracellular matrix (ECM). Type I collagen comprises 80%-90% of the skin's collagen, followed by type III (8%-12%) and type V (5%). Reactive oxygen species, matrix metalloproteinases, and collagen degradation all increase during photoaging, which disrupts the ECM's dynamic balance and lowers the amount of total collagen in the body. In recent years, domestic and foreign researchers have conducted multidimensional and multifaceted studies on collagen and skin photoaging. Collagen and the peptides that are derivates of it are currently being used more and more in biomedicine and medical esthetics.
Objective: Offering new suggestions for both the avoidance and remedy of photoaging.
Result: Both internal and external aging are inevitable, and as the main component of extracellular matrix, collagen plays a variety of functions in maintaining skin structure and fighting skin aging, and its role in photoaging is undeniable. Ultraviolet radiation can induce increased fragmentation and degradation of cutaneous collagen, while conversely, supplementation with collagen can effectively counteract photodamage-induced skin impairment.
Conclusion: Collagen and its derived peptides are indispensable in photoaging skin, holding promising prospects for applications in skin aging.

Liu H, Dong J, Du R, Gao Y, Zhao P. Collagen study advances for photoaging skin. Photodermatol Photoimmunol Photomed. 2024 Jan;40(1):e12931. doi: 10.1111/phpp.12931. Epub 2023 Nov 27. PMID: 38009842.

THE COLLAGEN SYNTHESIS RESPONSE TO AN ACUTE BOUT OF RESISTANCE EXERCISE IS GREATER WHEN INGESTING 30 G HYDROLYZED COLLAGEN COMPARED WITH 15 G AND 0 G IN RESISTANCE-TRAINED YOUNG MEN

Date & Journal: J Nutr. 2024 Jul

Abstract

Background: Resistance exercise (RE) stimulates collagen synthesis in skeletal muscle and tendon but there is limited and equivocal evidence regarding an effect of collagen supplementation and exercise on collagen synthesis. Furthermore, it is not known if a dose-response exists regarding the effect of hydrolyzed collagen (HC) ingestion and RE on collagen synthesis.

Objective: To determine the HC dose-response effect on collagen synthesis after high-intensity RE in resistance-trained young men.

Results: The serum PINP concentration × time area under the curve (AUC) was greater for 30 g (267 ± 79 μg·L^{-1}·h) than for 15 g (235 ± 70 μg·L^{-1}·h, P = 0.013) and 0 g HC (219 ± 88 μg·L^{-1}·h, P = 0.002) but there was no difference between 0 and 15 g HC (P = 0.225). The AUCs of glycine and proline were greater for 30 g than for 15 and 0 g HC (P < 0.05). Plasma β-CTX concentration decreased from -1 to +6 h (P < 0.05), with no differences between interventions.

Conclusions: Ingesting 30 g HC before high-intensity RE augments whole-body collagen synthesis more than 15 g and 0 g HC in resistance-trained young males.

Lee J, Tang JCY, Dutton J, Dunn R, Fraser WD, Enright K, Clark DR, Stewart CE, Erskine RM. The Collagen Synthesis Response to an Acute Bout of Resistance Exercise Is Greater when Ingesting 30 g Hydrolyzed Collagen Compared with 15 g and 0 g in Resistance-

ORAL COLLAGEN SUPPLEMENTATION: A SYSTEMATIC REVIEW OF DERMATOLOGICAL APPLICATIONS

Date & Journal: J Drugs Dermatol . 2019 Jan 1.

Abstract

The use of nutraceuticals such as collagen for skincare has been rising, but regulations are lacking on quality, absorption, and efficacy. To address this knowledge gap, clinical studies regarding the potential effects of collagen-based dietary supplements on skin are being completed. The objective of this article is to review the literature and assess available randomized-controlled trials using collagen supplementation for treatment efficacy regarding skin quality, anti-aging benefits, and potential application in medical dermatology.

Findings: Eleven studies with a total of 805 patients were included for review. Eight studies used collagen hydrolysate, 2.5g/d to 10g/d, for 8 to 24 weeks, for the treatment of pressure ulcers, xerosis, skin aging, and cellulite. Two studies used collagen tripeptide, 3g/d for 4 to 12 weeks, with notable improvement in skin elasticity and hydration. Lastly, one study using collagen dipeptide suggested anti-aging efficacy is proportionate to collagen dipeptide content.

Conclusions and Relevance: Preliminary results are promising for the short and long-term use of oral collagen supplements for wound healing and skin aging. Oral collagen supplements also increase skin elasticity, hydration, and dermal collagen density. Collagen supplementation is generally safe with no reported adverse events. Further studies are needed to elucidate medical use in skin barrier diseases such as atopic dermatitis and to determine optimal dosing regimens.

Choi FD, Sung CT, Juhasz ML, Mesinkovsk NA. Oral Collagen Supplementation: A Systematic Review of Dermatological Applications. J Drugs Dermatol. 2019 Jan 1;18(1):9-16. PMID: 30681787.

AN OVERVIEW OF THE BENEFICIAL EFFECTS OF HYDROLYSED COLLAGEN INTAKE ON JOINT AND BONE HEALTH AND ON SKIN AGEING

Date & Journal: Nutr Hosp . 2015 Jul 18.

Abstract

Introduction: Hydrolysate Collagen (HC) consists of small peptides with a molecular weight lower than 5.000 Dalton units (Da), produced from gelatinization and subsequent enzymatic hydrolysis of native collagen which is found in rich collagenic animal tissues. There is much evidence about the HC ingestion positive effect over degenerative joint and bones diseases.

Objective: The aim of this article is to review the present scientific studies about HC and to evaluate the HC ingestion therapeutical effects on some collagenic tissues as cartilage, bones and skin.

Results: Up to date, there are more than 60 scientific studies (in vitro, in vivo, clinics and on bioavailability) about HC ingestion efficacy on reducing collagen damage and loss consequences as joint pain and erosion (osteoarthritis), bone density loss (osteoporosis) and skin ageing.

Conclusions: Preclinical studies show that HC stimulates collagenic tissue regeneration by increasing not only collagen synthesis but minor components (glycosaminoglycans and hyaluronic acid) synthesis as well. Clinical studies show that HC continual ingestion helps to reduce and prevent joint pain, bone density loss and skin ageing. These results as well as its high level of tolerance and safety make HC ingestion attractive for a long-term use in bone and joint degenerative diseases and in fight against skin ageing.

Figueres Juher T, Basés Pérez E. REVISIÓN DE LOS EFECTOS BENEFICIOSOS DE LA INGESTA DE COLÁGENO HIDROLIZADO SOBRE LA SALUD OSTEOARTICULAR Y EL ENVEJECIMIENTO DÉRMICO [An overview of the beneficial effects of hydrolysed collagen intake on joint and bone health and on skin ageing]. Nutr Hosp. 2015 Jul 18;32 Suppl 1:62-6. Spanish. doi: 10.3305/nh.2015.32.sup1.9482.

A COLLAGEN SUPPLEMENT IMPROVES SKIN HYDRATION, ELASTICITY, ROUGHNESS, AND DENSITY: RESULTS OF A RANDOMIZED, PLACEBO-CONTROLLED, BLIND STUDY

Date & Journal: Nutrients . 2019 Oct 17.

Abstract

The purpose of this randomized, placebo-controlled, blind study was to investigate the effects of the drinkable nutraceutical ELASTEN® (QUIRIS Healthcare, Gütersloh, Germany) on skin aging and skin health. Drinking ampoules provides a blend of 2.5 g of collagen peptides, acerola fruit extract, vitamin C, zinc, biotin, and a native vitamin E complex. This controlled interventional trial was performed on 72 healthy women aged 35 years or older. They received either the food supplement (*n* = 36) or a placebo (*n* = 36) for twelve weeks. A skin assessment was carried out and based on objective validated methods, including corneometry (skin hydration), cutometry (elasticity), the use of silicon skin replicas with optical 3D phase-shift rapid in-vivo measurements (PRIMOS) (roughness), and skin sonography (density). The verum group was followed for an additional four weeks (without intake of the test product) to evaluate the sustainability of the changes induced by the intake of the test product. The test product significantly improved skin hydration, elasticity, roughness, and density. The differences between the verum group and the placebo group were statistically significant for all test parameters. These positive effects were substantially retained during the follow-up. The measured effects were fully consistent with the subjective assessments of the study participants. The nutraceutical was well tolerated.

Bolke L, Schlippe G, Gerß J, Voss W. A Collagen Supplement Improves Skin Hydration, Elasticity, Roughness, and Density: Results of a Randomized, Placebo-Controlled, Blind Study. Nutrients. 2019 Oct 17;11(10):2494. doi: 10.3390/nu11102494. PMID: 31627309; PMCID: PMC6835901.

ORAL COLLAGEN SUPPLEMENTATION FOR SKIN AGING: A FAD OR THE FUTURE?

Date & Journal: J Cosmet Dermatol . 2020 Apr.

Abstract

In recent years, oral collagen supplements have become a popular and trendy treatment in the world of skin health. It has been widely marketed to consumers for purported benefits in wrinkle reduction, skin-rejuvenation, skin-aging reversal, and skin plumping. However, there are currently limited data available in the literature and much regarding its possible effects on the skin has yet to be fully elucidated and understood. Here, we summarize some of the prominent studies in the literature and offer an evaluation of oral collagen supplementation for skin health.

Jhawar N, Wang JV, Saedi N. Oral collagen supplementation for skin aging: A fad or the future? J Cosmet Dermatol. 2020 Apr;19(4):910-912. doi: 10.1111/jocd.13096. Epub 2019 Aug 14. PMID: 31411379.

Topical Collagen Research

HYALURONIC ACID-CROSS-LINKED FILLER STIMULATES COLLAGEN TYPE 1 AND ELASTIC FIBER SYNTHESIS IN SKIN THROUGH THE TGF-B/SMAD SIGNALING PATHWAY IN A NUDE MOUSE MODEL.

Date & Journal: J Plast Reconstr Aesthet Surg. 2019 Apr 11

Compared to pure hyaluronic acid filler, cross-linked hyaluronic acid (HAc) exhibits superior biocompatibility and longevity as a dermal filler. We previously developed composite HAc-hydroxyapatite (HAp) fillers. Herein, we systematically compared the protein-level increase and gene expression between HAc-micro-HAp and HAc-nano-HAp in mice and determined the mechanisms underlying the biological responses to HAc and HAp. Five-week-old female BALB/c-nude mice were classified into five groups: normal skin, Radiesse, Restylane, HAc-nano-HAp, and HAc-micro-HAp. Fillers (200 µl) were injected to evenly fill the back of mice. Skin biopsies were performed to investigate collagen and elastic fiber synthesis after filler injections. Western blot analysis, real-time polymerase chain reaction analysis, and immunohistochemistry were performed to investigate protein and gene expression changes.

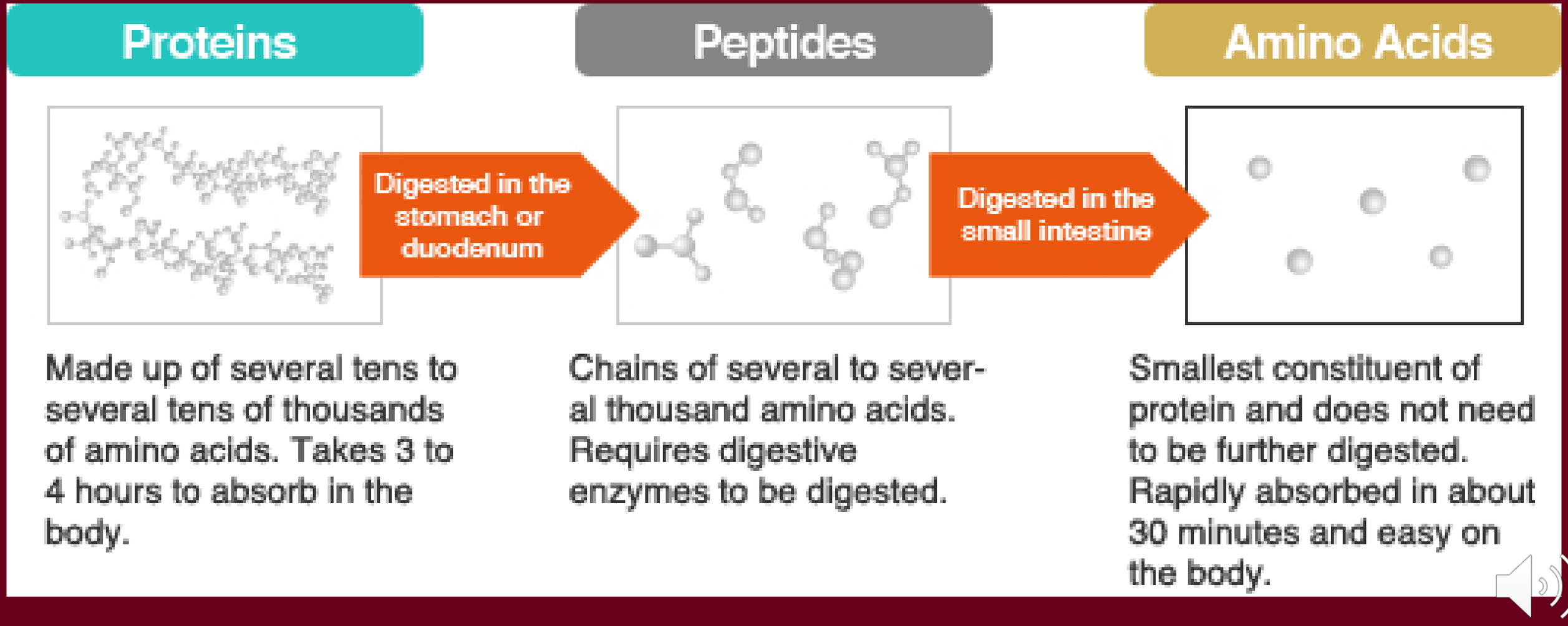
Fan Y, Choi TH, Chung JH, Jeon YK, Kim S. Hyaluronic acid-cross-linked filler stimulates collagen type 1 and elastic fiber synthesis in skin through the TGF-β/Smad signaling pathway in a nude mouse model. J Plast Reconstr Aesthet Surg. 2019 Aug;72(8):1355-1362. doi: 10.1016/j.bjps.2019.03.032. Epub 2019 Apr 11. PMID: 31036501.

II. BASIC SCIENCE (NUTRITION)

A. INFLAMMATION
   a) Natural inflammation reduction treatment options, including nutritional supplements and special dietary recommendations for an anti-inflammatory protocol, including legal hemp for anti-inflammatory management.
   b) Literature review
B. DIGESTION
   a) Green Alkaline foods for fiber and digestion
   b) Colon Health
   c) Minerals and Collagen Protein
C. AMINO ACIDS
   a) Definitions
   b) Amino acids for cardiovascular health
   c) Nitric oxide production

WHAT IS AN AMINO ACID?

- Building blocks of protein
- Basis of all life, essential to all metabolic processes



INTERNATIONAL SOCIETY OF SPORTS NUTRITION POSITION STAND: EFFECTS OF ESSENTIAL AMINO ACID SUPPLEMENTATION ON EXERCISE AND PERFORMANCE

Date & Journal: J Int Soc Sports Nutr. 2023 Dec

Abstract

Position Statement: The International Society of Sports Nutrition (ISSN) presents this position based on a critical examination of literature surrounding the effects of essential amino acid (EAA) supplementation on skeletal muscle maintenance and performance. This position stand is intended to provide a scientific foundation to athletes, dietitians, trainers, and other practitioners as to the benefits of supplemental EAA in both healthy and resistant (aging/clinical) populations. EAAs are crucial components of protein intake in humans, as the body cannot synthesize them. The daily recommended intake (DRI) for protein was established to prevent deficiencies due to inadequate EAA consumption. The following conclusions represent the official position of the Society: 1. Initial studies on EAAs' effects on skeletal muscle highlight their primary role in stimulating muscle protein synthesis (MPS) and turnover. Protein turnover is critical for replacing degraded or damaged muscle proteins, laying the metabolic foundation for enhanced functional performance. Consequently, research has shifted to examine the effects of EAA supplementation - with and without the benefits of exercise - on skeletal muscle maintenance and performance. 2. Supplementation with free-form EAAs leads to a quick rise in peripheral EAA concentrations, which in turn stimulates MPS. 3. The safe upper limit of EAA intake (amount), without inborn metabolic disease, can easily accommodate additional supplementation. 4. At rest, stimulation of MPS occurs at relatively small dosages (1.5-3.0 g) and seems to plateau at around 15-18 g. 5. The MPS stimulation by EAAs does not require non-essential amino acids. 6. Free-form EAA ingestion stimulates MPS more than an equivalent amount of intact protein. 7. Repeated EAA-induced MPS stimulation throughout the day does not diminish the anabolic effect of meal intake. 8. Although direct comparisons of various formulas have yet to be investigated, aging requires a greater proportion of leucine to overcome the reduced muscle sensitivity known as "anabolic resistance." 9. Without exercise, EAA supplementation can enhance functional outcomes in anabolic-resistant populations. 10. EAA requirements rise in the face of caloric deficits. During caloric deficit, it's essential to meet whole-body EAA requirements to preserve anabolic sensitivity in skeletal muscle.

Ferrando AA, Wolfe RR, Hirsch KR, Church DD, Kviatkovsky SA, Roberts MD, Stout JR, Gonzalez DE, Sowinski RJ, Kreider RB, Kerksick CM, Burd NA, Pasiakos SM, Ormsbee MJ, Arent SM, Arciero PJ, Campbell BI, VanDusseldorp TA, Jager R, Willoughby DS, Kalman DS,

THE EFFECT OF BRANCHED-CHAIN AMINO ACID SUPPLEMENTATION ON CANCER TREATMENT

Date & Journal: Nutr Health. 2023 Dec

Abstract

Background: Anticancer therapies are associated with significant adverse side effects and few treatments that alleviate symptoms exist. Branched-chain amino acids (BCAAs) have been investigated as an intervention for reducing anticancer therapy side effects, although a review of the literature results has yet to be published. **Aim:** The current review summarizes evidence surrounding this topic and suggests both support and caution in using BCAAs as a treatment for patients receiving anticancer therapies. **Methods:** In this review, two literature searches were completed. Google Scholar, PubMed, EBSCOhost, and Cochrane databases were searched using the terms "branched-chain amino acids and cancer" and "BCAA and cancer." **Results:** Two bodies of evidence emerged: One supporting beneficial effects and the other showing adverse outcomes of BCAA supplementation in patients with cancer. Evidence of benefit was a decrease in malnourishment and unintentional weight loss during and after chemotherapy. Potential harms included the idea cancer cells may utilize BCAAs as a source of energy for growth. **Conclusions:** Supplementation of BCAAs in individuals with cancer should be implemented cautiously. Those who are severely malnourished due to anticancer therapy may benefit the most. BCAA supplementation may also be provided once cancer has been destroyed from the individual's body to aid with recovery.

Lee K, Blanton C. The effect of branched-chain amino acid supplementation on cancer treatment. Nutr Health. 2023 Dec;29(4):621-635. doi: 10.1177/02601060231153428. Epub 2023 Jan 26. PMID: 36703299.

INTERNATIONAL REGULATIONS ON AMINO ACID USE IN FOODS AND SUPPLEMENTS AND RECOMMENDATIONS TO CONTROL THEIR SAFETY BASED ON PURITY AND QUALITY

Date & Journal: J Nutr . 2020 Oct 1

Abstract

We examined international regulatory developments related to the use of proteinogenic amino acids in human nutrition and concluded that the current risk-assessment practices tend to focus exclusively on setting maximum daily limits. In this brief review we argue that controlling the standards of purity and ingredient quality are the key safety issues that should be considered during risk assessment. Moreover, if maximum intake limits on amino acids are implemented, they should be defined using a well-established rationale for the health risks associated with high intakes. This would avoid setting limits that are so low that they render the dietary supplements ineffective and which, therefore, could mislead the consumer. We further suggest that there should be greater regional concordance in how the use of amino acids as ingredients is regulated and use the capacity of industry to oversee pre-competitive issues, such as standards of purity and scientific research on the safety of generic ingredients. Our arguments are based on clinical safety scientific research and oversights of amino acid purity standards conducted in the last decade by the not-for-profit international association, the International Council on Amino Acid Science.

Smriga M. International Regulations on Amino Acid Use in Foods and Supplements and Recommendations to Control Their Safety Based on Purity and Quality. J Nutr. 2020 Oct 1;150(Suppl 1):2602S-2605S. doi: 10.1093/jn/nxaa093. PMID: 33000158.

THE RENAL SAFETY OF L-CARNITINE, L-ARGININE, AND GLUTAMINE IN ATHLETES AND BODYBUILDERS

Date & Journal: J Ren Nutr . 2019 May

Abstract

One of the major concerns about taking amino acid supplements is their potential adverse effects on the kidney as a major organ involved in the metabolism and excretion of exogenous substances. The aim of this study is to review available data about renal safety of the most prominent amino acid supplements including L-arginine, glutamine and also L-carnitine as well as creatine (as amino acid derivatives) in athletes and bodybuilders. The literature was searched by keywords such as "L-carnitine", "L-arginine", "glutamine", and "kidney injury" in databases such as Scopus, Medline, Embase, and ISI Web of Knowledge. Articles published from 1950 to December 2017 were included. Among 3171, 5740, and 1608 records after primary search in the relevant databases, 8, 7, and 5 studies have been finally included, respectively, for L-carnitine, L-arginine, and glutamine in this review. Arginine appears to have both beneficial and detrimental effects on kidney function. However, adverse effects are unlikely to occur with the routine doses (from 3 to >100 g/day). The risks and benefits of L-carnitine on the athletes' and bodybuilders' kidney have not been evaluated yet. However, L-carnitine up to 6000 mg/day is generally considered to be a safe supplement at least in healthy adults. Both short-term (20-30 g within a few hours) and long-term (0.1 g/kg four times daily for 2 weeks) glutamine supplementation in healthy athletes were associated with no significant adverse effects, but it can cause glomerulosclerosis and serum creatinine level elevation in the setting of diabetic nephropathy. Creatine supplementation (ranged from 5 to 30 g/day) also appears to have no detrimental effects on kidney function of individuals without underlying renal diseases. More clinical data are warranted to determine the optimal daily dose and intake duration of common supplemental amino acids associated with the lowest renal adverse effects in sportsmen and sports women.

Davani-Davari D, Karimzadeh I, Sagheb MM, Khalili H. The Renal Safety of L-Carnitine, L-Arginine, and Glutamine in Athletes and Bodybuilders. J Ren Nutr. 2019 May;29(3):221-234. doi: 10.1053/j.jrn.2018.08.014. Epub 2018 Oct 16. PMID:

AMINO ACIDS IN INTESTINAL PHYSIOLOGY AND HEALTH

Adv Exp Med Biol . 2020

Abstract:

Dietary protein digestion is an efficient process resulting in the absorption of amino acids by epithelial cells, mainly in the jejunum. Some amino acids are extensively metabolized in enterocytes supporting their high energy demand and/or production of bioactive metabolites such as glutathione or nitric oxide. In contrast, other amino acids are mainly used as building blocks for the intense protein synthesis associated with the rapid epithelium renewal and mucin production. Several amino acids have been shown to support the intestinal barrier function and the intestinal endocrine function. In addition, amino acids are metabolized by the gut microbiota that use them for their own protein synthesis and in catabolic pathways releasing in the intestinal lumen numerous metabolites such as ammonia, hydrogen sulfide, branched-chain amino acids, polyamines, phenolic and indolic compounds. Some of them (e.g. hydrogen sulfide) disrupts epithelial energy metabolism and may participate in mucosal inflammation when present in excess, while others (e.g. indole derivatives) prevent gut barrier dysfunction or regulate enteroendocrine functions. Lastly, some recent data suggest that dietary amino acids might regulate the composition of the gut microbiota, but the relevance for the intestinal health remains to be determined. In summary, amino acid utilization by epithelial cells or by intestinal bacteria appears to play a pivotal regulator role for intestinal homeostasis. Thus, adequate dietary supply of amino acids represents a key determinant of gut health and functions.

Beaumont M, Blachier F. Amino Acids in Intestinal Physiology and Health. Adv Exp Med Biol. 2020;1265:1-20. doi: 10.1007/978-3-030-45328-2_1. PMID: 32761567.

FUNCTIONAL NITRIC OXIDE NUTRITION TO COMBAT CARDIOVASCULAR DISEASE

Curr Atheroscler Rep . 2018 Mar 17

Purpose: To reveal the mechanisms of nitric oxide (NO) production in humans and how lifestyle, drug therapy, and hygienic practices can decrease NO production. Furthermore, to show how functional nitric oxide nutrition can overcome these limitations to restore endogenous NO production and combat cardiovascular disease.

Findings: Research over the past decade has revealed that inorganic nitrate and nitrite found naturally in green leafy vegetables and other vegetables such as beets can provide the human body with a source of bioactive nitric oxide. NO is one of the most important molecules produced within the cardiovascular system that maintains normal blood pressure and prevents inflammation, immune dysfunction, and oxidative stress, hallmarks of cardiovascular disease. This pathway is dependent upon the amount of inorganic nitrate and nitrite in the foods we eat, the presence of oral nitrate-reducing bacteria, and sufficient stomach acid production. The concept of food being medicine and medicine being food has lost its place in the practice and implementation of modern medicine over the past century. Certain dietary patterns and specific foods are known to confer very significant protective effects for many human diseases, including cardiovascular disease, the number one killer of men and women in the developed world. However, identification of single or multiple bioactive molecules that are responsible for these effects has escaped scientists and nutritionists for many years. This review will highlight the biochemical, physiological, and epidemiological basis for functional nitric oxide nutrition that can be safely and effectively utilized in patients.

Bryan NS. Functional Nitric Oxide Nutrition to Combat Cardiovascular Disease. Curr Atheroscler Rep. 2018;20(5):21. Published 2018 Mar 17. doi:10.1007/s11883-018-0723-0

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Supplement Facts

Suggested Dosage: Up to 4 capsules per day or as recommended by your healthcare provider.

Servings per container: 30
Serving Size: 4 capsules

Ingredients	Amount Per Serving	% Daily Value
Vitamin C (Ascorbic Acid)	100mg	167%
Vitamin B1 Thiamine	20 mg	1333%
Vitamin B2 Riboflavin	40 mg	1765%
Vitamin B3 Niacinimide	65 mg	325%
Pantothenic Acid	10 mg	100%
Vitamin B6 Pyridoxine HCl	20 mg	1000%
Folic Acid	400 mcg	100%

A proprietary blend of 2955 mg total of the following ingredients: L-Arginine; L-Taurine, L-Lysine, L-Glutamine; L-Leucine; L-Isoleucine; L-Valine; Green tea leaf extract (Camelia sinensis); Organic American Ginseng (Panax ginseng); Organic Maca Root Powder (Lipidium Meyenii); L-Phenylalanine; N-Acetyl Tyrosine; L-Phenylethylamine; Caffeine from Coffee Bean (natural source) 150mg. Made with organic ingredients when possible.
Other ingredients: Vegetable capsule.

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Pantothenic Acid	10 mg	100%
Vitamin B6 Pyridoxine HCL	20 mg	1000%
Folic Acid	400 mcg	100%

A proprietary blend of 2225 mg total of the following ingredients: L-Arginine; L-Taurine, L-Lysine, L-Glutamine; L-Leucine; L-Isoleucine; L-Valine; Korean Ginseng (Panax ginseng); Eleutherococcus Senticosus; Maca Root extract; L-Phenylalanine; L-Tyrosine; Phenylethylamine. Made with organic ingredients when possible.
Other ingredients: HPMC vegetable capsule.

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II. BASIC SCIENCE (NUTRITION)

D. IMMUNE SYSTEM RESEARCH
   a) Recent studies from the NIH/PubMed
   b) Nutritional options
   c) Objective nutritional questionnaire
E. WATER
   a) Molecular hydrogen, constipation, ionization
   b) Filtration and nutritional benefits
   c) Water pH & safety
F. EVIDENCE BASED DIET RELATED RESEARCH
   a) Intermittent Fasting
   b) Ketogenic Diet
   c) Plant Based Nutrition

TERRAIN THEORY VERSUS GERM THEORY: A FRESH LOOK AT AN OLD PRINCIPLE

This article explores the resurgence of terrain theory in modern medicine. While germ theory, which focuses on eradicating specific germs to prevent illness, has dominated medical practice since the development of antibiotics in the 1940s. Terrain theory is that your body is like a terrain, keeping our terrain healthy includes nutritious fuel i.e. organic, Non-GMO food, free of additives or toxins, exercise, proper spinal alignment, and rest to repair our cells during sleep. So, lifestyle plays a vital role in our health.

Pharmaceuticals can wipe out some bugs, while also taking out some beneficial bugs, and can also deplete critical nutrients. Holistic terrain theory can help us avoid certain diagnoses and can help us recover faster. It's always better to clean out our tank to avoid attracting disease.

Maintaining a healthy body through balanced nutrition, regular exercise, and proper sleep can naturally resist disease. Tekstra suggests that by fostering an environment that supports overall wellness, individuals can better prevent and reverse diseases without relying solely on pharmaceuticals. This holistic approach could potentially provide better long-term health outcomes.

Tekstra, E. (2024, June). Terrain Theory Versus Germ Theory: A Fresh Look at an Old Principle.

TERRAIN THEORY VERSUS GERM THEORY: A FRESH LOOK AT AN OLD PRINCIPLE (PART 2)

Key Takeaways:

History is our teacher. Todays advanced tools do not make theories, observations, and ideas of the past obsolete.

Science is always evolving. Competing theories always gets us closer to the truth than considering only one model alone.

The human body is infinitely complex. Doctors and scientists may give the impression that health is completely understood, but the complexity of the human body is the opposite. We still know very little about the human body's wonders and complexities.

For long-term outcome, a natural approach to health may be better. Balance of the terrain may provide better outcome than focusing on eliminating an external culprit.

Tekstra, E. (2024, June). Terrain Theory Versus Germ Theory: A Fresh Look at an Old Principle.

INHERITED STRUCTURE PROPERTIES OF LARCH ARABINOGALACTAN AFFECTED VIA THE TEMPO/NABR/NAOCL OXIDATIVE SYSTEM

Date & Journal: Polymers (Basel). 2024 May 22

Abstract

Arabinogalactan (AG), extracted from larch wood, is a β-1,3-galactan backbone and β-1,6-galactan side chains with attached α-1-arabinofuranosyl and β-1-arabinopyranosyl residues. Although the structural characteristics of arabinogalactan II type have already been studied, its functionalization using 2,2,6,6-tetramethylpiperidin-1-oxyl (TEMPO) oxidation remains a promising avenue. In this study, the oxidation of AG, a neutral polysaccharide, was carried out using the TEMPO/NaBr/NaOCl system, resulting in polyuronides with improved functional properties. The oxidation of AG was controlled by analyzing portions of the reaction mixture using spectrophotometric and titration methods. To determine the effect of the TEMPO/NaBr/NaOCl system, air-dried samples of native and oxidized AG were studied by Fourier-transform infrared (FTIR) and nuclear magnetic resonance (NMR) spectroscopy, as well as by gel permeation chromatography. Compounds that model free (1,1-diphenyl-2-picrylhydrazyl (DPPH)) and hydroxyl radicals (iron(II) sulfate, hydrogen peroxide, and salicylic acid) were used to study the antioxidant properties. It was found that, in oxidized forms of AG, the content of carboxyl groups increases by 0.61 mmol compared to native AG. The transformation of oxidized AG into the H^+ form using a strong acid cation exchanger leads to an increase in the number of active carboxyl groups to 0.76 mmol. Using FTIR spectroscopy, characteristic absorption bands (1742, 1639, and 1403 cm^{-1}) were established, indicating the occurrence of oxidative processes with a subsequent reduction in the carboxyl group. The functionality of AG was also confirmed by gel permeation chromatography (GPC), which is reflected in an increase in molecular weights (up to 15,700 g/mol). A study of the antioxidant properties of the oxidized and protonated forms of AG show that the obtained antioxidant activity (AOA) values are generally characteristic of polyuronic acids. Therefore, the TEMPO oxidation of AG and other neutral polysaccharides can be considered a promising approach for obtaining compounds with the necessary controlled characteristics.

Ionin VA, Malyar YN, Borovkova VS, Zimonin DV, Gulieva RM, Fetisova OY. Inherited Structure Properties of Larch Arabinogalactan Affected via the TEMPO/NaBr/NaOCl Oxidative System. Polymers (Basel). 2024 May 22;16(11):1458. doi: 10.3390/polym16111458. PMID.

AGARICUS BLAZEI MURILL EXTRACT-LOADED IN ALGINATE/POLY(VINYL ALCOHOL) FILMS PREPARED BY CA2+ CROSS-LINKING FOR WOUND HEALING APPLICATIONS

Date & Journal: J Biomed Mater Res B Appl Biomater. 2023 May

Abstract

This work aimed the development and evaluation of the wound healing activity of films based on sodium alginate, polyvinyl alcohol (PVA) and Ca^{2+} loaded with Agaricus blazei Murill hydroalcoholic extract (AbE). Firstly, AbE was prepared using a previously standardized methodology. The films were prepared by casting technique and cross-linked with Ca^{2+} using $CaCl_2$ as cross-linking agent. The physicochemical, morphological and water vapor barrier properties of the films were analyzed and the pre-clinical efficacy was investigated against the cutaneous wound model in mice. The films showed barrier properties to water vapor promising for wound healing. AbE showed physical and chemical interactions between both polymers, noticed by Fourier transform infrared spectroscopy, X-ray diffraction, scanning electron microscopy, and thermal analysis. The delivery of AbE in alginate/PVA films enhanced the antioxidant and wound healing properties of these polymers. Consequently, a reduction of malondialdehyde levels was observed, as well as an increase of the epidermis/dermis thickness and enhancement in collagen I deposition. Thus, these formulations are promising biomaterials for wound care and tissue repairing.

Campelo MDS, Mota LB, Câmara Neto JF, Barbosa MLL, Gonzaga MLDC, Leal LKAM, Bastos MDSR, Soares SA, Ricardo NMPS, Cerqueira GS, Ribeiro MENP. Agaricus blazei Murill extract-loaded in alginate/poly(vinyl alcohol) films prepared by Ca2+ cross-linking for wo

[RESEARCH PROGRESS ON STRUCTURES, ACTIVITIES, AND BIOSYNTHESIS OF BLAZEISPIROL COMPOUNDS FROM AGARICUS BLAZEI]

Date & Journal: Zhongguo Zhong Yao Za Zhi. 2024 Mar

Abstract

Agaricus blazei is a rare medicinal and edible fungus with a crispy taste and delicious flavor. Both fruiting body and mycelium are rich in polysaccharides, sterols, terpenoids, peptides, lipids, polyphenols, and other active ingredients, which have strong pharmacological activities such as anti-tumor, lipid-lowering, glucose-lowering, immunomodulation, optimization of intestinal flora, and anti-oxidation. Therefore, it is a kind of fungal resource with a great prospect of edible and medicinal development. Among the reported chemical components of A. blazei, blazeispirol is a series of sterol compounds unique to A. blazei, which has a spiral structure and is different from classical steroids. It is an important active ingredient found in the mycelium of A. blazei and has significant hepatoprotective activity. It can be used as a phylogenetic and chemotaxonomic marker of A. blazei strains and is considered an excellent lead compound for drug development. According to the skeleton structure characteristics, the 17 discovered blazeispirol compounds can be divided into two types: blazeispirane and problazeispirane. In order to further explore the resource of blazeispirol compounds of A. blazei, the discovery, isolation, structure, biological activity, and biosynthetic pathways of blazeispirol compounds of A. blazei were systematically reviewed. Besides, the metabolic regulation strategies related to the fermentation synthesis of blazeispirol A by A. blazei were discussed. This review could provide a reference for the efficient synthesis and development of blazeispirol compounds, the research and development of related drugs and functional foods, and the quality improvement of A. blazei and other medicinal and edible fungi resources and derivatives.

Ding C, Peng SY, Meng JH, Li X, Gong J, Li YY, Cui PW. [Research progress on structures, activities, and biosynthesis of blazeispirol compounds from Agaricus blazei]. Zhongguo Zhong Yao Za Zhi. 2024 Mar;49(5):1144-1153. Chinese. doi: 10.19540/j.cnki.cjcmm

ANDROGRAPHIS PANICULATA AND ANDROGRAPHOLIDE - A SNAPSHOT ON RECENT ADVANCES IN NANO DRUG DELIVERY SYSTEMS AGAINST CANCER

Date & Journal: **Curr Drug Deliv. 2024**

Abstract

Cancer is one of the deadliest illnesses of the 21st century. Chemotherapy and radiation therapies both have considerable side effects. Antitumor antibiotics are one of them. Coughs, common colds, fevers, laryngitis, and infectious disorders have all been treated with *Andrographis paniculata* for centuries. Extracts of *Andrographis* effectively treat various ailments, as well as cancer. The most active molecule in *Andrographis paniculata* is andrographolide a, diterpene, and lactone. *Andrographis paniculata* and its derivatives have long been used to treat various ailments. Anti-inflammatory and cancerfighting characteristics have been observed in Andrographolide. Andrographolide, a diterpene lactone separated from *Andrographis paniculata*, has also been shown to have important criticalessential biological protective properties. It has also been suggested that it could be used to treat major human diseases like-rheumatoid like rheumatoid, colitis, and Parkinsons disease. This summary aims to highlight Andrographolide as a promising cancer treatment option. Several databases were searched for andrographolides cytotoxic/anti-cancer effects in pre-clinical and clinical research to serve this purpose. Several studies have shown that Andrographolide is helpful in cancer medication, as detailed in this review.

Deshmukh R, Jain AK, Singh R, Paul SD, Harwansh RK. Andrographis paniculata and Andrographolide - A Snapshot on Recent Advances in Nano Drug Delivery Systems against Cancer. Curr Drug Deliv. 2024;21(5):631-644. doi: 10.2174/1567201820666230203115752. PMID

ADVANCES IN RESEARCH ON THE ANTI-TUMOR MECHANISM OF ASTRAGALUS POLYSACCHARIDES

Date & Journal: Front Oncol. 2024 Mar

Abstract

The dry root of the soybean plant *Astragalus membranaceus* (Fisch) Bge. var. *mongholicus* (Bge) Hsiao or *A. membranaceus* (Fisch) Bge, Astragali Radix (AR) has a long medicinal history. *Astragalus* polysaccharide (APS), the natural macromolecule that exhibits immune regulatory, anti-inflammatory, anti-tumor, and other pharmacological activities, is an important active ingredient extracted from AR. Recently, APS has been increasingly used in cancer therapy owing to its anti-tumor ability as it prevents the progression of prostate, liver, cervical, ovarian, and non-small-cell lung cancer by suppressing tumor cell growth and invasion and enhancing apoptosis. In addition, APS enhances the sensitivity of tumors to antineoplastic agents and improves the body's immunity. This macromolecule has prospects for broad application in tumor therapy through various pathways. In this article, we present the latest progress in the research on the anti-tumor effects of APS and its underlying mechanisms, aiming to provide novel theoretical support and reference for its use in cancer therapy.

Yang Q, Meng D, Zhang Q, Wang J. Advances in research on the anti-tumor mechanism of *Astragalus* polysaccharides. Front Oncol. 2024 Mar 6;14:1334915. doi: 10.3389/fonc.2024.1334915. PMID: 38515577; PMCID: PMC10955345.

THE POTENTIAL USE OF VITAMIN D3 AND PHYTOCHEMICALS FOR THEIR ANTI-AGEING EFFECTS

Date & Journal: Int J Mol Sci. 2024 Feb 9

Abstract

Unlike other vitamins, vitamin D3 is synthesised in skin cells in the body. Vitamin D3 has been known as a bone-related hormone. Recently, however, it has been considered as an immune vitamin. Vitamin D3 deficiency influences the onset of a variety of diseases. Vitamin D3 regulates the production of proinflammatory cytokines such as tumour necrosis factor-α (TNF-α) through binding to vitamin D receptors (VDRs) in immune cells. Since blood levels of vitamin D3 (25-OH-D3) were low in coronavirus disease 2019 (COVID-19) patients, there has been growing interest in the importance of vitamin D3 to maintaining a healthy condition. On the other hand, phytochemicals are compounds derived from plants with over 7000 varieties and have various biological activities. They mainly have health-promoting effects and are classified as terpenoids, carotenoids, flavonoids, etc. Flavonoids are known as the anti-inflammatory compounds that control TNF-α production. Chronic inflammation is induced by the continuous production of TNF-α and is the fundamental cause of diseases like obesity, dyslipidaemia, diabetes, heart and brain diseases, autoimmune diseases, Alzheimer's disease, and cancer. In addition, the ageing process is induced by chronic inflammation. This review explains the cooperative effects of vitamin D3 and phytochemicals in the suppression of inflammatory responses, how it balances the natural immune response, and its link to anti-ageing effects. In addition, vitamin D3 and phytochemicals synergistically contribute to anti-ageing by working with ageing-related genes. Furthermore, prevention of ageing processes induced by the chronic inflammation requires the maintenance of healthy gut microbiota, which is related to daily dietary habits. In this regard, supplementation of vitamin D3 and phytochemicals plays an important role. Recently, the association of the prevention of the non-disease condition called "ME-BYO" with the maintenance of a healthy condition has been an attractive regimen, and the anti-ageing effect discussed here is important for a healthy and long life.

Santa K, Kumazawa Y, Watanabe K, Nagaoka I. The Potential Use of Vitamin D3 and Phytochemicals for Their Anti-Ageing Effects. Int J Mol Sci. 2024 Feb 9;25(4):2125. doi: 10.3390/ijms25042125. PMID: 38396804; PMCID: PMC10889119.

VITAMIN D: A MASTER EXAMPLE OF NUTRIGENOMICS

Date & Journal: Redox Biol. 2023 Jun

Abstract

Nutrigenomics attempts to characterize and integrate the relation between dietary molecules and gene expression on a genome-wide level. One of the biologically active nutritional compounds is vitamin D_3, which activates via its metabolite 1α,25-dihydroxyvitamin D_3 ($1,25(OH)_2D_3$) the nuclear receptor VDR (vitamin D receptor). Vitamin D_3 can be synthesized endogenously in our skin, but since we spend long times indoors and often live at higher latitudes where for many winter months UV-B radiation is too low, it became a true vitamin. The ligand-inducible transcription factor VDR is expressed in the majority of human tissues and cell types, where it modulates the epigenome at thousands of genomic sites. In a tissue-specific fashion this results in the up- and downregulation of primary vitamin D target genes, some of which are involved in attenuating oxidative stress. Vitamin D affects a wide range of physiological functions including the control of metabolism, bone formation and immunity. In this review, we will discuss how the epigenome- and transcriptome-wide effects of $1,25(OH)_2D_3$ and its receptor VDR serve as a master example in nutrigenomics. In this context, we will outline the basis of a mechanistic understanding for personalized nutrition with vitamin D_3.

Carlberg C, Raczyk M, Zawrotna N. Vitamin D: A master example of nutrigenomics. Redox Biol. 2023 Jun;62:102695. doi: 10.1016/j.redox.2023.102695. Epub 2023 Apr 5. PMID: 37043983; PMCID: PMC10119805.

GUIDELINES FOR PREVENTING AND TREATING VITAMIN D DEFICIENCY: A 2023 UPDATE IN POLAND

Date & Journal: Nutrients. 2023 Jan 30

Abstract

Introduction: All epidemiological studies suggest that vitamin D deficiency is prevalent among the Polish general population. Since vitamin D deficiency was shown to be among the risk factors for many diseases and for all-cause mortality, concern about this problem led us to update the previous Polish recommendations. **Methods:** After reviewing the epidemiological evidence, case-control studies and randomized control trials (RCTs), a Polish multidisciplinary group formulated questions on the recommendations for prophylaxis and treatment of vitamin D deficiency both for the general population and for the risk groups of patients. The scientific evidence of pleiotropic effects of vitamin D as well as the results of panelists' voting were reviewed and discussed. Thirty-four authors representing different areas of expertise prepared position statements. The consensus group, representing eight Polish/international medical societies and eight national specialist consultants, prepared the final Polish recommendations. **Results:** Based on networking discussions, the ranges of total serum 25-hydroxyvitamin D concentration indicating vitamin D deficiency [<20 ng/mL (<50 nmol/L)], suboptimal status [20-30 ng/mL (50-75 nmol/L)], and optimal concentration [30-50 ng/mL (75-125 nmol/L)] were confirmed. Practical guidelines for cholecalciferol (vitamin D_3) as the first choice for prophylaxis and treatment of vitamin D deficiency were developed. Calcifediol dosing as the second choice for preventing and treating vitamin D deficiency was introduced. **Conclusions:** Improving the vitamin D status of the general population and treatment of risk groups of patients must be again announced as healthcare policy to reduce a risk of spectrum of diseases. This paper offers consensus statements on prophylaxis and treatment strategies for vitamin D deficiency in Poland.

Płudowski P, Kos-Kudła B, Walczak M, Fal A, Zozulińska-Ziółkiewicz D, Sieroszewski P, Peregud-Pogorzelski J, Lauterbach R, Targowski T, Lewiński A, Spaczyński R, Wielgoś M, Pinkas J, Jackowska T, Helwich E, Mazur A, Ruchała M, Zygmunt A, Szalecki M, Bosso

A COMPREHENSIVE REVIEW OF HERBAL SUPPLEMENTS USED FOR PERSISTENT SYMPTOMS ATTRIBUTED TO LYME DISEASE

Date & Journal: Integr Med (Encinitas). 2023 Mar

Abstract

Context: Lyme disease is the most common, tick-borne disease in the USA. While most patients successfully recover with antibiotics, some patients experience persistent symptoms for months to years. Patients who attribute chronic symptoms to Lyme disease commonly use herbal supplements. The complexity, variability in dose and formulation, and lack of data for these herbal compounds make it difficult to assess their efficacy and safety.

Objective: This review examines the evidence for the antimicrobial activity, safety, and drug-drug interactions of 18 herbal supplements that patients commonly use for treatment of persistent symptoms attributed to Lyme disease.

Results: Seven of the 18 herbs reviewed had evidence for in-vitro activity against B. burgdorferi. These compounds included: (1) cat's claw (2) cryptolepis, (3) Chinese skullcap, (4) Japanese knotweed, (5) sweet wormwood, (6) thyme, and (7) oil of oregano. With the exception of oil of oregano these compounds also have anti-inflammatory activity. In vivo data and clinical trials are lacking. Clinicians should be cautious as many of the identified compounds have drug interactions and additive effects that could lead to increased risks for bleeding, hypotension, and hypoglycemia.

Conclusions: Many of the herbs that alternative and integrative practitioners use to treat Lyme disease have anti-inflammatory effects that may contribute to patients' perceptions of symptomatic improvement. Some herbs have limited demonstrated anti-borrelial activity in vitro, but in-vivo data and clinical trial data is lacking. Further research is required to determine the efficacy, safety and appropriate use of these herbs for this patient population.

Alehagen U, Johansson P, Svensson E, Aaseth J, Alexander J. Improved cardiovascular health by supplementation with selenium and coenzyme Q10: applying structural equation modelling (SEM) to clinical outcomes and biomarkers to explore underlying mechanisms

IMPROVED CARDIOVASCULAR HEALTH BY SUPPLEMENTATION WITH SELENIUM AND COENZYME Q10: APPLYING STRUCTURAL EQUATION MODELLING (SEM) TO CLINICAL OUTCOMES AND BIOMARKERS TO EXPLORE UNDERLYING MECHANISMS IN A PROSPECTIVE RANDOMIZED DOUBLE-BLIND PLACEBO-CONTROLLED INTERVENTION PROJECT IN SWEDEN

Date & Journal: Eur J Nutr . 2022 Apr 6.

Abstract

Purpose: Selenium and coenzyme Q10 have synergistic antioxidant functions. In a four-year supplemental trial in elderly Swedes with a low selenium status, we found improved cardiac function, less cardiac wall tension and reduced cardiovascular mortality up to 12 years of follow-up. Here we briefly review the main results, including those from studies on biomarkers related to cardiovascular risk that were subsequently conducted. In an effort, to explain underlying mechanisms, we conducted a structured analysis of the inter-relationship between biomarkers.

Results: In addition to positive clinical effects, the intervention with selenium and coenzyme Q10 was also associated with favourable effects on biomarkers of cardiovascular risk. Using these results in the SEM model, we showed that the weights of the first-order factors inflammation and oxidative stress were high, together forming a second-order factor inflammation/oxidative stress influencing the factors, fibrosis ($\beta = 0.74$; $p < 0.001$) and myocardium ($\beta = 0.65$; $p < 0.001$). According to the model, the intervention impacted fibrosis and myocardium through these factors, resulting in improved cardiac function and reduced CV mortality.

Conclusion: Selenium reduced inflammation and oxidative stress. According to the SEM analysis, these effects reduced fibrosis and improved myocardial function pointing to the importance of supplementation in those low on selenium and coenzyme Q10.

Alehagen U, Johansson P, Svensson E, Aaseth J, Alexander J. Improved cardiovascular health by supplementation with selenium and coenzyme Q10: applying structural equation modelling (SEM) to clinical outcomes and biomarkers to explore underlying mechanisms

ZINC IN CANCER THERAPY REVISITED

Date & Journal: Isr Med Assoc J . 2022 Apr

Abstract

Zinc is a trace element, which is abundant in nature. It is also an essential and important micronutrient found in many foods. It has a role in multiple bodily processes including wound healing and boosting of the immune system. This review shows evidence of zinc deficiency in cancer patients of all types, a deficiency that correlates with disease severity and negatively correlates with survival rates. Lower zinc levels led to more severe and advanced disease symptoms and to lower survival rates. Zinc is a nanoparticle and acts as a photosensitizer in photodynamic therapy in various combinations with other substances. It also shows incredible cytotoxicity and tumor suppressive ability in studies conducted both in vitro and in vivo as well as in studies conducted in humans. This result is shown in all types of cancer tested. Zinc shows incredible toxicity toward cancer cells without showing any side effects toward healthy cells. It is recommended that zinc be added to cancer treatment regimens to alleviate zinc deficiency in cancer patients and perhaps to treat cancer as a whole.

Gelbard A. Zinc in Cancer Therapy Revisited. Isr Med Assoc J. 2022 Apr;24(4):258-262. PMID: 35415986.

EFFECT OF ZINC PLUS MULTIVITAMIN SUPPLEMENTATION ON GROWTH IN SCHOOL CHILDREN

Date & Journal: Pediatr Int. 2016 Nov

Abstract

Background: Zinc and multiple vitamins are essential for growth. Zinc and vitamin deficiency is very common in developing countries. The aim of this study was to assess the efficacy of zinc plus multivitamin supplements in improving growth of healthy Thai schoolchildren.

Results: Seventy children each were randomized to the treatment and placebo groups. The children who received zinc and multivitamins had significantly higher gain in height (4.9 ± 1.3 vs 3.6 ± 0.9 cm, respectively; $P < 0.001$). Subgroup analysis showed significant improvement in height, especially in preadolescents. The increased gain in height was irrespective of baseline height and weight. The extra gain in height occurred after 2 months of supplementation. The changes in other anthropometric indices were not significantly different.

Conclusion: Supplementation of chelated zinc plus multivitamins for 6 months significantly increased height gain in Thai schoolchildren and was well tolerated.

Rerksuppaphol S, Rerksuppaphol L. Effect of zinc plus multivitamin supplementation on growth in school children. Pediatr Int. 2016 Nov;58(11):1193-1199. doi: 10.1111/ped.13011. Epub 2016 Aug 31. PMID: 27083763.

HOST AND VIRAL ZINC-FINGER PROTEINS IN COVID-19

Date & Journal: Int J Mol Sci . 2022 Mar 28.

Abstract

An unprecedented effort to tackle the ongoing COVID-19 pandemic has characterized the activity of the global scientific community over the last two years. Hundreds of published studies have focused on the comprehension of the immune response to the virus and on the definition of the functional role of SARS-CoV-2 proteins. Proteins containing zinc fingers, both belonging to SARS-CoV-2 or to the host, play critical roles in COVID-19 participating in antiviral defenses and regulation of viral life cycle. Differentially expressed zinc finger proteins and their distinct activities could thus be important in determining the severity of the disease and represent important targets for drug development. Therefore, we here review the mechanisms of action of host and viral zinc finger proteins in COVID-19 as a contribution to the comprehension of the disease and also highlight strategies for therapeutic developments.

Esposito S, D'Abrosca G, Antolak A, Pedone PV, Isernia C, Malgieri G. Host and Viral Zinc-Finger Proteins in COVID-19. Int J Mol Sci. 2022 Mar 28;23(7):3711. doi: 10.3390/ijms23073711. PMID: 35409070; PMCID: PMC8998646.

CALCIUM, MAGNESIUM, AND ZINC SUPPLEMENTATION DURING PREGNANCY: THE ADDITIVE VALUE OF MICRONUTRIENTS ON MATERNAL IMMUNE RESPONSE AFTER SARS-COV-2 INFECTION

Date & Journal: Nutrients . 2022 Mar 30.

Abstract

Magnesium may contribute to the immune response during and after SARS-CoV-2 infection by acting as a cofactor for immunoglobulin production and other processes required for T and B cell activity. Considering magnesium as a recommended dietary supplement during pregnancy and the possible role of magnesium deficiency in COVID-19 and its complications, the current study sought to determine the effect of magnesium and magnesium-containing nutritional supplements on the immune response following SARS-CoV-2 infection in pregnant women, as well as to observe differences in pregnancy outcomes based on the supplements taken during pregnancy. The study followed a cross-sectional design, where patients with a history of SARS-CoV-2 infection during their pregnancy were surveyed for their preferences in nutritional supplementation and their profile compared with existing records from the institutional database. A cohort of 448 pregnant women with COVID-19 during 22 months of the pandemic was assembled, out of which 13.6% took a magnesium-only supplement, and 16.5% supplemented their diet with a combination of calcium, magnesium, and zinc. Around 60% of patients in the no-supplementation group had the SARS-CoV-2 anti-RBD lower than 500 U/mL, compared with 50% in those who took magnesium-based supplements. A quantity of magnesium >450 mg in the taken supplements determined higher levels of antibody titers after COVID-19. Low magnesium dosage (<450 mg) was an independent risk factor for a weak immune response (OR-1.25, *p*-value = 0.003). The observed findings suggest supplementing the nutritional intake of pregnant women with magnesium-based supplements to determine higher levels of SARS-CoV-2 anti-RBD antibodies, although causality remains unclear.

Citu IM, Citu C, Margan MM, Craina M, Neamtu R, Gorun OM, Burlea B, Bratosin F, Rosca O, Grigoras ML, Motoc A, Malita D, Neagoe O, Gorun F. Calcium, Magnesium, and Zinc Supplementation during Pregnancy: The Additive Value of Micronutrients on Maternal Imm

MULTIPLE MICRONUTRIENT SUPPLEMENTATION: AS A SUPPORTIVE THERAPY IN THE TREATMENT OF COVID-19

Date & Journal: Biomed Res Int . 2022 Mar 14

Abstract

During the infection and treatment of the SARS-CoV-2 viral infection, age and comorbidities play a major role in the successful management of COVID-19. The nutritional status changes which occur in the body vary with the age and underlying conditions and has a vital role in the functioning of the immune system and cellular membrane integrity, thus minimizing the vulnerability to the infection. Considering the data already published by eminent researchers, a few micronutrients have shown outstanding results as supportive therapies in the treatment of viral infections. Micronutrient like zinc improves the membrane barrier integrity, has anti-inflammatory activity, and is involved in antibody production. Vitamin A supports the phagocytic activity of macrophages, while vitamin C reduces the worsening of respiratory tract infections by restoring the dysfunctional epithelial barrier of the lungs. Vitamin D, vitamin E, selenium, and omega-3 fatty acid metabolites play a major role in immunomodulation and in the inhibition of proinflammatory cytokine production. Magnesium is involved in the synthesis of antibodies, while copper, vitamin B12, and folate have significant effects on immune cells. A few researchers suggest that iron supplementation has reduced the risk of acquiring respiratory tract infections in children. As the age of the patient increases, the need for micronutrients increases, thus leading to an imbalanced nutritional status which in turn increases the risk and fatality of the infections. The use of micronutrients in modulating the inflammatory, immune responses, and the epithelial barrier integrity is explored during the treatment of viral infections for faster recovery.

Diyya ASM, Thomas NV. Multiple Micronutrient Supplementation: As a Supportive Therapy in the Treatment of COVID-19. Biomed Res Int. 2022 Mar 14;2022:3323825. doi: 10.1155/2022/3323825. PMID: 35355818; PMCID: PMC8960013

HYPERTONIC SOLUTION IN SEVERE COVID-19 PATIENT: A POTENTIAL ADJUVANT THERAPY

Date & Journal: Front Med (Lausanne). 2022 Jun 21

Abstract

Coronavirus disease 2019 (COVID-19) features hyper-inflammation, cytokine storm, neutrophil function changes, and sodium chloride (NaCl) homeostasis disruption, while the treatment with NaCl hypertonic solutions (HS) controls electrolytic body homeostasis and cell functions. HS treatment is a simple, popular, economic, and feasible therapy to regulate leukocyte function with a robust anti-inflammatory effect in many inflammatory diseases. The purpose of this narrative review is to highlight the knowledge on the use of HS approaches against viral infection over the past years and to describe the mechanisms involved in the release of neutrophil extracellular traps (NETs) and production of cytokine in severe lung diseases, such as COVID-19. We reported the consequences of hyponatremia in COVID-19 patients, and the immunomodulatory effects of HS, either *in vitro* or *in vivo*. We also described the relationship between electrolyte disturbances and COVID-19 infection. Although there is still a lack of clinical trials, hypertonic NaCl solutions have marked effects on neutrophil function and NETs formation, emerging as a promising adjuvant therapy in COVID-19.

Gennari-Felipe M, Borges L, Dermargos A, Weimann E, Curi R, Pithon-Curi TC, Hatanaka E. Hypertonic Solution in Severe COVID-19 Patient: A Potential Adjuvant Therapy. Front Med (Lausanne). 2022 Jun 21;9:917008. doi: 10.3389/fmed.2022.917008. PMID: 35801207; PMCID: PMC9253300.

OLIVE LEAF EXTRACT SUPPLEMENTATION COMBINED WITH CALORIE-RESTRICTED DIET ON REDUCING BODY WEIGHT AND FAT MASS IN OBESE WOMEN: RESULT OF A RANDOMIZED CONTROL TRIAL

Date & Journal: Clin Nutr Res . 2021 Oct 31.

Abstract

The present trial aims to evaluate a supplementation of the olive leaf extract (OLE) in adjunct with a weight loss diet on anthropometric indices, glycemic indices, lipid profile, as well as the level of adipokines, and free fatty acid in obese women. We carried out an 8-week randomized, placebo-controlled, double-blind, parallel-group, clinical trial. The participants were randomly stratified according to age and they were assigned to one of the two study groups: Standard weight loss diet (estimated daily energy requirements minus 500 kcal) + OLE supplementation (n = 35) in intervention group or Standard weight loss diet (estimated daily energy requirements minus 500 kcal) + placebo (n = 35) in placebo group. The study groups were homogeneous regarding the baseline age, height, weight, body mass index (BMI), waist circumferences, married status, and physical activity levels ($p > 0.05$). The results of analysis of covariance presented significant decreases in BMI, fat mass, and body weight in the OLE group compared to those in the placebo group ($p < 0.05$). At the end of the study, the serum levels of fasting blood sugar, insulin, low-density lipoprotein cholesterol, total cholesterol, leptin, fatty free acid, and homeostasis model assessment-insulin resistance significantly decreased, and serum levels of high-density lipoprotein cholesterol and adiponectin elevated in the intervention group ($p < 0.05$). Based on results it seems that the addition of OLE to a hypocaloric diet for 8-week compared with a hypocaloric diet alone may be more effective in modifying obesity and metabolic risk factors.

Haidari F, Shayesteh F, Mohammad-Shahi M, Jalali MT, Ahmadi-Angali K. Olive Leaf Extract Supplementation Combined with Calorie-Restricted Diet on Reducing Body Weight and Fat Mass in Obese Women: Result of a Randomized Control Trial. Clin Nutr Res. 2021 O

OLIVE LEAF EXTRACT SUPPLEMENTATION IMPROVES THE VASCULAR AND METABOLIC ALTERATIONS ASSOCIATED WITH AGING IN WISTAR RATS

Date & Journal: Sci Rep . 2021 Apr 14.

Abstract

Olive leaves are rich in bioactive substances which exert anti-inflammatory, antioxidant, insulin-sensitizing and antihypertensive effects. The aim of this study was to analyze the possible beneficial effects of an olive leaf extract (OLE) rich in secoiridoids and phenolic compounds on the aging-induced metabolic and vascular alterations. Three experimental groups of rats were used: 3-month-old rats, 24-month-old rats and 24-month-old rats supplemented 21 days with OLE (100 mg/kg). Administration of OLE to aged rats decreased the weight of adrenal glands and prevented the aging-induced loss of body weight and muscle mass. In the serum, OLE reduced the circulating levels of LDL-cholesterol and IL-6 and increased the concentrations of leptin and adiponectin. In the liver OLE attenuated the decreased gene expression of SOD-1, GSR, GCK and GSK-3β and reduced the aging-induced overexpression of NOX-4, Alox-5, iNOS and TNF-α. In aorta segments, OLE prevented endothelial dysfunction and vascular insulin resistance and improved vasoconstriction in response to KCl and NA. Improvement in vascular function was associated with the attenuation of the alterations in the gene expression of COX-2, IL-6, GPx, NOX-1 and IL-10. In conclusion, OLE exerts anti-inflammatory and antioxidant effects in aged rats and attenuates the alterations in vascular function associated with aging.

González-Hedström D, García-Villalón ÁL, Amor S, de la Fuente-Fernández M, Almodóvar P, Prodanov M, Priego T, Martín AI, Inarejos-García AM, Granado M. Olive leaf extract supplementation improves the vascular and metabolic alterations associated with agi

NOVEL MEDICINAL MUSHROOM BLEND AS A PROMISING SUPPLEMENT IN INTEGRATIVE ONCOLOGY: A MULTI-TIERED STUDY USING 4T1 TRIPLE-NEGATIVE MOUSE BREAST CANCER MODEL

Date & Journal: Int J Mol Sci . 2020 May 14.

Abstract

Although medicinal mushroom extracts have been proposed as promising anti-cancer agents, their precise impacts on metastatic breast cancer are still to be clarified. For this purpose, the present study exploited the effect of a novel medicinal mushroom blend, namely Micotherapy U-care, in a 4T1 triple-negative mouse breast cancer model. Mice were orally administered with Micotherapy U-care, consisting of a mixture of *Agaricus blazei, Ophiocordyceps sinensis, Ganoderma lucidum, Grifola frondosa*, and *Lentinula edodes*. The syngeneic tumor-bearing mice were generated by injecting 4T1 cells in both supplemented and non-supplemented mice. After sacrifice 25 days later, specific endpoints and pathological outcomes of the murine pulmonary tissue were evaluated. (i) Histopathological and ultrastructural analysis and (ii) immunohistochemical assessment of TGF-ß1, IL-6 and NOS2, COX2, SOD1 as markers of inflammation and oxidative stress were performed. The QoL was comparatively evaluated. Micotherapy U-care supplementation, starting before 4T1 injection and lasting until the end of the experiment, dramatically reduced the pulmonary metastases density, also triggering a decrease of fibrotic response, and reducing IL-6, NOS, and COX2 expression. SOD1 and TGF-ß1 results were also discussed. These findings support the valuable potential of Micotherapy U-care as adjunct therapy in the critical management of triple-negative breast cancer.

Roda E, Luca F, Iorio CD, Ratto D, Siciliani S, Ferrari B, Cobelli F, Borsci G, Priori EC, Chinosi S, Ronchi A, Franco R, Di Francia R, Berretta M, Locatelli CA, Gregori A, Savino E, Bottone MG, Rossi P. Novel Medicinal Mushroom Blend as a Promising Suppl

A QUALITY-OF-LIFE STUDY IN HEALTHY ADULTS SUPPLEMENTED WITH LENTINEX® BETA-GLUCAN OF SHIITAKE CULINARY-MEDICINAL MUSHROOM, LENTINUS EDODES (AGARICOMYCETES)

Date & Journal: Int J Med Mushrooms . 2020.

Abstract

Lentinus edodes (=Lentinula edodes) is a culinary-medicinal mushroom with a long tradition of use in Asia. The major active substance in L. edodes is a beta-(1-3,1-6)-glucan (lentinan). GlycaNova produces Lentinex®, which contains this beta-glucan from L. edodes mycelia, in a proprietary process that maintains the triple helix molecular structure and high molecular weights. This study was carried out to investigate the effect of Lentinex supplementation on the well-being of adults. We evaluated the effect of Lentinex in healthy adult subjects in a randomized, placebo-controlled, double-blind trial. Sixty-three subjects, randomly allocated to two groups, took orally either 1-2 mL/day Lentinex (1-2 mg beta-glucan) or placebo for four weeks. The participants completed a well-being questionnaire prior to commencing supplementation and again at the end of the in-home study. The results showed an important and statistically significant improvement in well-being over the period in the treated group compared with the placebo group. The degree of improvement in the treated group, including relative to placebo, was higher for subjects who had lower initial well-being than for subjects with higher initial well-being. In conclusion, the lower an individual's initial well-being, the more Lentinex helped.

Aldwinckle J, Kristiansen B. A Quality-of-Life Study in Healthy Adults Supplemented with Lentinex® Beta-Glucan of Shiitake Culinary-Medicinal Mushroom, Lentinus edodes (Agaricomycetes). Int J Med Mushrooms. 2020;22(5):407-415. doi: 10.1615/IntJMedMushroom

ANDROGRAPHOLIDE SUPPRESSES NON-SMALL-CELL LUNG CANCER PROGRESSION THROUGH INDUCTION OF AUTOPHAGY AND ANTITUMOR IMMUNE RESPONSE

Date & Journal: Pharmacol Res . 2022 Mar 31.

Abstract

Despite recent advances in diagnosis and therapeutic strategies, treatment of non-small-cell lung cancer (NSCLC) remains unsatisfactory in terms of prognosis. Andrographolide (AD), a principal active component of Andrographis paniculata (Burm.f.) Nees, exerts anti-cancer therapeutic properties. AD has been used for centuries in China for clinical treatment of viral infections. However, the pharmacological biology of AD in NSCLC remains unknown. In this study, AD regulated autophagy and PD-L1 expression in NSCLC. Molecular dynamics simulations indicated that AD bound directly to signal transducer and activator of transcription-3 (STAT3) with high affinity. Proteomics analysis indicated that AD reduced the expression of tumour PD-L1 in NSCLC by suppressing JAK2/STAT3 signalling. AD modulated the P62-dependent selective autophagic degradation of PD-L1 by inhibiting STAT3 phosphorylation. In vivo study revealed that AD suppressed tumour growth in H1975 xenograft mice and Lewis lung carcinoma cell models, and better efficacy was obtained at higher concentrations. AD prolonged the survival time of the mice and enhanced the treatment efficacy of anti-PD-1 mAb immunotherapy by stimulating $CD8^+$ T cell infiltration and function. This work elucidated the specific mechanism by which AD inhibited NSCLC. Treatment with the combination of AD and anti-PD-1 mAb immunotherapy could be a potential strategy for patients with NSCLC.

Wang XR, Jiang ZB, Xu C, Meng WY, Liu P, Zhang YZ, Xie C, Xu JY, Xie YJ, Liang TL, Yan HX, Fan XX, Yao XJ, Wu QB, Leung EL. Andrographolide suppresses non-small-cell lung cancer progression through induction of autophagy and antitumor immune response.

IN SILICO STUDIES ON STRUCTURAL INHIBITION OF SARS-COV-2 MAIN PROTEASE M ^{PRO} BY MAJOR SECONDARY METABOLITES OF ANDROGRAPHIS PANICULATA AND CINCHONA OFFICINALIS

Date & Journal: Biologia (Bratisl) . 2022 Feb 28.

Abstract

The COVID-19 infection by Novel Corona Virus (SARS-CoV-2) has become one of the largest pandemic diseases, with cumulative confirmed infections of 275,233,892 and 5,364,996 deaths to date according to World Health Organization. Due to the absence of any approved antiviral drug to treat COVID-19, its lethality is getting severe with time. The main protease of SARS-CoV-2, M^{pro} is considered one of the potential drug targets because of its role in processing proteins translated from viral RNA. In the present study, four of the plant metabolites, 14-deoxy-11,12-didehydroandrographolide, andrograpanin, quinine, cinchonine from two eminent medicinal plants *Andrographis paniculata and Cinchona officinalis*, have been evaluated against the main protease of SARS-CoV-2 through *in-silico* molecular docking and molecular dynamics simulation study. From the result interpretations, it is found that andrograpanin has strong binding affinities with the target protein in its active site with potential negative energies. Molecular Dynamic simulation and MMGBSA studies suggest that earlier reported N3 inhibitor and andrograpanin exhibit effective binding interactions involving identical amino acid residues with the same binding pockets of the main protease of SARS-CoV-2. Therefore, the theoretical experiment suggests that andrograpanin, could be considered the promising inhibitor against SARS-CoV-2 M^{pro}.

Majumdar M, Singh V, Misra TK, Roy DN. In silico studies on structural inhibition of SARS-CoV-2 main protease Mpro by major secondary metabolites of Andrographis paniculata and Cinchona officinalis. Biologia (Bratisl). 2022 Feb 28:1-17. doi: 10.1007/s1175

Strengthening the Immune System and Reducing Inflammation and Oxidative Stress through Diet and Nutrition: Considerations during the COVID-19 Crisis

Nutrients. 2020 May 27

Abstract

The coronavirus-disease 2019 (COVID-19) was announced as a global pandemic by the World Health Organization. Challenges arise concerning how to optimally support the immune system in the general population, especially under self-confinement. An optimal immune response depends on an adequate diet and nutrition in order to keep infection at bay. For example, sufficient protein intake is crucial for optimal antibody production. Low micronutrient status, such as of vitamin A or zinc, has been associated with increased infection risk. Frequently, poor nutrient status is associated with inflammation and oxidative stress, which in turn can impact the immune system. Dietary constituents with especially high anti-inflammatory and antioxidant capacity include vitamin C, vitamin E, and phytochemicals such as carotenoids and polyphenols. Several of these can interact with transcription factors such as NF-kB and Nrf-2, related to anti-inflammatory and antioxidant effects, respectively. Vitamin D in particular may perturb viral cellular infection via interacting with cell entry receptors (angiotensin converting enzyme 2), ACE2. Dietary fiber, fermented by the gut microbiota into short-chain fatty acids, has also been shown to produce anti-inflammatory effects. In this review, we highlight the importance of an optimal status of relevant nutrients to effectively reduce inflammation and oxidative stress, thereby strengthening the immune system during the COVID-19 crisis.

Iddir M, Brito A, Dingeo G, Fernandez Del Campo SS, Samouda H, La Frano MR, Bohn T. Strengthening the Immune System and Reducing Inflammation and Oxidative Stress through Diet and Nutrition: Considerations during the COVID-19 Crisis. Nutrients. 2020 May 27;12(6):1562. doi: 10.3390/nu12061562. PMID: 32471251; PMCID: PMC7352291.

SELENIUM AND AUTOIMMUNE DISEASES: A REVIEW ARTICLE

Curr Rheumatol Rev . 2019

Abstract

Background: Selenium is an essential trace element with fundamental effects on human biology. Trace elements deficiency is not an uncommon finding in autoimmune diseases. This deficiency may be a consequence of autoimmune diseases or may contribute to their etiology. With regard to evidence showing the association between selenium deficiency and generation of reactive oxygen species and subsequent inflammation, reviewing the role of selenium in collagen vascular diseases could help researchers to devise strategies for managing these diseases.

Objective: The present study aimed to evaluate the role of selenium and autoimmune rheumatic diseases.

Study eligibility criteria: All the studies on the use of selenium without any limitations in terms of the preparation method, administration route, or formulation process were included in the study. The exclusion criteria were: 1) Articles published in languages other than English, 2) Administration of chemical and hormonal drugs rather than selenium, 3) Investigation of the effects of selenium on the autoimmune problems in animal models, and 4) Insufficiency of the presented data or poor description of the applied methods. Furthermore, review articles, meta-analyses, expert opinions, editorial letters, case reports, consensus statements, and qualitative studies were excluded from the study.

Sahebari M, Rezaieyazdi Z, Khodashahi M. Selenium and Autoimmune Diseases: A Review Article. Curr Rheumatol Rev. 2019;15(2):123-134. doi:10.2174/1573397114666181016112342

DOES LARCH ARABINOGALACTAN ENHANCE IMMUNE FUNCTION? A REVIEW OF MECHANISTIC AND CLINICAL TRIALS

Nutr Metab (Lond). 2016 April.

Abstract

The common cold is a viral infection with important economic burdens in Western countries. The research and development of nutritional solutions to reduce the incidence and severity of colds today is a major focus of interest, and larch arabinogalactan seems to be a promising supportive agent. Arabinogalactan has been consumed by humans for thousands of years and is found in a variety of common vegetables as well as in medicinal herbs. The major commercial sources of this long, densely branched, high-molecular-weight polysaccharide are North American larch trees. The aim of this article is to review the immunomodulatory effects of larch arabinogalactan derived from Larix laricina and Larix occidentalis (North American Larix species) and more specifically its role in the resistance to common cold infections. In cell and animal models, larch arabinogalactan is capable of enhancing natural killer cells and macrophages as well as the secretion of pro-inflammatory cytokines. In humans a clinical study demonstrated that larch arabinogalactan increased the body's potential to defend against common cold infection. Larch arabinogalactan decreased the incidence of cold episodes by 23 %. Improvements of serum antigen-specific IgG and IgE response to Streptococcus pneumoniae and tetanus vaccination suggesting a B cell dependent mechanism have been reported in vaccination studies with larch arabinogalactan, while the absence of response following influenza vaccination suggests the involvement of a T cell dependent mechanism. These observations suggest a role for larch arabinogalactan in the improvement of cold infections, although the mode of action remains to be further explored.

Dion C, Chappuis E, Ripoll C. Does larch arabinogalactan enhance immune function? A review of mechanistic and clinical trials. Nutr Metab (Lond). 2016;13:28. Published 2016 Apr 12. doi:10.1186/s12986-016-0086-x

ASTRAGALUS MEMBRANACEUS NANOPARTICLES MARKEDLY IMPROVE IMMUNE AND ANTI-OXIDATIVE RESPONSES; AND PROTECTION AGAINST AEROMONAS VERONII IN NILE TILAPIA OREOCHROMIS NILOTICUS

Fish Shellfish Immunol. 2020 Feb.

Abstract: The effects of dietary administration of Astragalus membranaceus nanoparticles (ANP) on immune and anti-oxidative responses, growth performance and disease resistance of Oreochromis niloticus were evaluated in the present study. Fish were divided into three groups and received the ANP at rates of 0 (control), 1, and 2%/kg diet for four weeks. After the four-week feeding trial, three fish from each replicate were sampled for immune and anti-oxidative responses evaluation, ten fish from each group were challenged with A. veronii, and nine fish from each group were subjected to cold and hypoxia challenges. It was obvious from the results that ANP significantly enhanced lysozyme activity and nitrous oxide (NO) activities, as well as improved superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx) activities. Also, aspartate aminotransferase, alanine transaminase, glucose, and cortisol measurements showed significantly lower levels in incorporated groups compared to the control. Growth performance; and amylase and lipase digestive enzymes activities also showed markedly improved results. Expression of heat shock protein 70 (HSP70) and interleukin 1, beta (IL-1β) genes were significantly upregulated throughout the entire experimental period. When challenged with A. veronii, the mortality of treated groups was significantly ($P < 0.05$) lower than the control. Current results prove that dietary ANP had a synergistic effect on immune and anti-oxidative responses, growth performance and disease resistance of Oreochromis niloticus.

Elabd H, Wang HP, Shaheen A, Matter A. Astragalus membranaceus nanoparticles markedly improve immune and anti-oxidative responses; and protection against Aeromonas veronii in Nile tilapia Oreochromis niloticus. Fish Shellfish Immunol. 2020;97:248-256. doi:10.1016/j.fsi.2019.12.025

ASTRAGALUS POLYSACCHARIDES ENHANCE THE IMMUNE RESPONSE TO AVIAN INFECTIOUS BRONCHITIS VIRUS VACCINATION IN CHICKENS

Microb Pathog. 2017 Oct.

Abstract

Astragalus polysaccharides (APS) are biological macromolecules extracted from Astragalus species that have strong immunoregulatory properties. In this study, APS were employed as an adjuvant for an avian infectious bronchitis virus (IBV) vaccine, and its effects on the cellular immune and humoral immune responses to vaccination in chickens were investigated. One hundred and fifty chicken were randomly divided into five groups (n = 30, each group). The chickens in all groups, except for the unvaccinated control group, were vaccinated with an IBV DNA vaccine. Three of the four vaccinated groups were administered different doses of APS (APSL, 10 mg/kg; APSM, 50 mg/kg; and APSH, 100 mg/kg) after the first vaccination, and the remaining vaccinated group served as a control, without any additional treatment. At 14, 28, and 42 days after the first vaccination, serum anti-IBV antibody titers; peripheral lymphocyte proliferation; and the mRNA expression of IL-1β, IL-2, IL-8, and TNF-α in the spleen were assessed by enzyme-linked immunosorbent assay (ELISA), the cell counting kit-8 (CCK-8), and real time quantitative RT-PCR (qRT-PCR), respectively. At most time points, the titer of IBV-specific antibodies, lymphocyte proliferation, and IL-1β, IL-2, IL-8, and TNF-α mRNA expression levels were higher in three APS groups than in the vaccine control group, and these increases were dose-dependent. These data suggest that APS could be used as an adjuvant for IBV vaccination to provide better protection against IBV infection.

Zhang P, Wang J, Wang W, et al. Astragalus polysaccharides enhance the immune response to avian infectious bronchitis virus vaccination in chickens. Microb Pathog. 2017;111:81-85. doi:10.1016/j.micpath.2017.08.023

EFFECT OF MUSHROOM AGARICUS BLAZEI ON IMMUNE RESPONSE AND DEVELOPMENT OF EXPERIMENTAL CEREBRAL MALARIA

- Malar J. 2015 Aug 11.

Background: Cerebral malaria (CM) is debilitating and sometimes fatal. Disease severity has been associated with poor treatment access, therapeutic complexity and drug resistance and, thus, alternative therapies are increasingly necessary. In this study, the effect of the administration of Agaricus blazei, a mushroom of Brazilian origin in a model of CM caused by Plasmodium berghei, strain ANKA, was investigated in mice.

Results: Mice treated with A. blazei aqueous extract or fraction C, that shows antioxidant activity, displayed lower parasitaemia, increased survival, reduced weight loss and protection against the development of CM. The administration of A. blazei resulted in reduced levels of TNF, IL-1β and IL-6 production when compared to untreated P. berghei-infected mice. Agaricus blazei (aqueous extract or fraction C) treated infected mice displayed reduction of brain lesions. Although chloroquine treatment reduced parasitaemia, there was increased production of proinflammatory cytokines and damage in the CNS not observed with A. blazei treatment. Moreover, the in vitro pretreatment of infected erythrocytes followed by in vivo infection resulted in lower parasitaemia, increased survival, and little evidence of clinical signs of disease.

Conclusions: This study strongly suggests that the administration of A. blazei (aqueous extract or fraction C) was effective in improving the consequences of CM in mice and may provide novel therapeutic strategies.

Val, C.H., Brant, F., Miranda, A.S. et al. Effect of mushroom Agaricus blazei on immune response and development of experimental cerebral malaria. Malar J 14, 311 (2015). https://doi.org/10.1186/s12936-015-0832-y

ANTIGENOTOXIC AND ANTIOXIDANT POTENTIAL OF MEDICINAL MUSHROOMS (IMMUNE ASSIST) AGAINST DNA DAMAGE INDUCED BY FREE RADICALS: AN IN VITRO STUDY

Mutat Res Genet Toxicol Environ Mutagen. 2019 Sep.

Abstract

Immune Assist (IA) is produced from extract of six species of medical mushrooms: Agaricus blazei - Cordyceps sinensis - Grifola frondosa - Ganoderma lucidum - Coriolus versicolor - Lentinula edodes. The genoprotective potential of IA was evaluated for the first time. Significant antigenotoxic effects were detected in human peripheral blood cells against H2O2 induced DNA damage, in the pretreatment and in the posttreatment. The most efficient concentration of IA in pretreatment was 500 µg/mL, while in posttreatment it was the concentration of 250 µg/mL. Kinetics of attenuation of H2O2 induced DNA damage in posttreatment with the optimal concentration of IA showed significant decrease in the number of damaged cells at all time periods (15-60 min), reaching the greatest reduction after 15 and 45 min. Remarkable ·OH scavenging properties and moderate reducing power, together with the modest DPPH scavenging activity, could be responsible for the great attenuation of DNA damage after 15 min of exposure to IA, while reduction of DNA damage after 45 min could be the result in additional stimulation of the cell's repair machinery. Our results suggest that IA displayed antigenotoxic and antioxidant properties. A broader investigation of its profile in biological systems is needed.

Živković L, Bajić V, Bruić M, et al. Antigenotoxic and antioxidant potential of medicinal mushrooms (Immune Assist) against DNA damage induced by free radicals-an in vitro study. Mutat Res. 2019;845:403078. doi:10.1016/j.mrgentox.2019.06.008

THE EFFECT OF OLIVE LEAF EXTRACT ON UPPER RESPIRATORY ILLNESS IN HIGH SCHOOL ATHLETES: A RANDOMIZED CONTROL TRIAL

Nutrients. 2019 Feb 9.

Abstract

Upper respiratory illness (URI) has a major impact on both training and competition in an athletic setting. High school athletes are a sub-category who have reported higher illness rates than professional and sub-elite high school athletes of the same sport. Olive leaf extract (OLE) is an over-the-counter supplement that contains polyphenols, notably oleuropein and hydroxytyrosol, that have antiviral, antibacterial, anti-inflammatory and antioxidant properties that may reduce URI rates. Thirty-two high school students who play sport for the elite team at their school were recruited to a randomised controlled trial and allocated to a daily placebo or OLE (extent equivalent to 20 g of olive leaf, containing 100 mg oleuropein) supplementation for nine weeks during their competitive season. Twice weekly measures of wellbeing, training load and respiratory illness (sporting upper respiratory illness (SUPPRESS) questionnaire) were recorded at trainings, meetings or games. There was no significant difference in illness incidence (odds ratio (OR): 1.02 (95% confidence interval (CI) 0.21⁻4.44)), but there was a significant 28% reduction in sick days (OR: 0.72 (95% CI 0.56⁻0.93) p-value = 0.02) when supplemented with OLE. The dietary intakes of the athletes were sub-optimal with regard to immune support. OLE supplementation over a season did not significantly reduce URI incidence, but did decrease duration in high school athletes, potentially aiding return to play.

Somerville V, Moore R, Braakhuis A. The Effect of Olive Leaf Extract on Upper Respiratory Illness in High School Athletes: A Randomised Control Trial. Nutrients. 2019;11(2):358. Published 2019 Feb 9. doi:10.3390/nu11020358

VITAMIN C AND SARS CORONAVIRUS

- J Antimicrob Chemother. 2003 Dec.

Sir,

Recently, a new coronavirus was identified as the cause of the severe acute respiratory syndrome (SARS).1 In the absence of a specific treatment for SARS, the possibility that vitamin C may show non-specific effects on severe viral respiratory tract infections should be considered. There are numerous reports indicating that vitamin C may affect the immune system,2,3 for example the function of phagocytes, transformation of T lymphocytes and production of interferon. In particular, vitamin C increased the resistance of chick embryo tracheal organ cultures to infection caused by an avian coronavirus.4 Studies in animals found that vitamin C modifies susceptibility to various bacterial and viral infections,3 for example protecting broiler chicks against an avian coronavirus.5 Placebo-controlled trials have shown quite consistently that the duration and severity of common cold episodes are reduced in the vitamin C groups,3 indicating that viral respiratory infections in humans are affected by vitamin C levels. There is also evidence indicating that vitamin C may affect pneumonia.3 In particular, three controlled trials with human subjects reported a significantly lower incidence of pneumonia in vitamin C-supplemented groups,6 suggesting that vitamin C may affect susceptibility to lower respiratory tract infections under certain conditions. The possibility that vitamin C affects severe viral respiratory tract infections would seem to warrant further study, especially in light of the recent SARS epidemic.

Hemilä H. Vitamin C and SARS coronavirus. J Antimicrob Chemother. 2003;52(6):1049-1050. doi:10.1093/jac/dkh002

VITAMIN C AND IMMUNE FUNCTION

Published: Nutrients. Nov. 2017

Abstract

Vitamin C is an essential micronutrient for humans, with pleiotropic functions related to its ability to donate electrons. It is a potent antioxidant and a cofactor for a family of biosynthetic and gene regulatory enzymes. Vitamin C contributes to immune defense by supporting various cellular functions of both the innate and adaptive immune system. Vitamin C supports epithelial barrier function against pathogens and promotes the oxidant scavenging activity of the skin, thereby potentially protecting against environmental oxidative stress. Vitamin C accumulates in phagocytic cells, such as neutrophils, and can enhance chemotaxis, phagocytosis, generation of reactive oxygen species, and ultimately microbial killing. It is also needed for apoptosis and clearance of the spent neutrophils from sites of infection by macrophages, thereby decreasing necrosis/NETosis and potential tissue damage. The role of vitamin C in lymphocytes is less clear, but it has been shown to enhance differentiation and proliferation of B- and T-cells, likely due to its gene regulating effects. Vitamin C deficiency results in impaired immunity and higher susceptibility to infections. In turn, infections significantly impact on vitamin C levels due to enhanced inflammation and metabolic requirements. Furthermore, supplementation with vitamin C appears to be able to both prevent and treat respiratory and systemic infections. Prophylactic prevention of infection requires dietary vitamin C intakes that provide at least adequate, if not saturating plasma levels (i.e., 100-200 mg/day), which optimize cell and tissue levels. In contrast, treatment of established infections requires significantly higher (gram) doses of the vitamin to compensate for the increased inflammatory response and metabolic demand.

Carr AC, Maggini S. Vitamin C and Immune Function. Nutrients. 2017;9(11):1211. Published 2017 Nov 3. doi:10.3390/nu9111211

ZINC AND IMMUNITY: AN ESSENTIAL INTERRELATION

Published: Arch Biochem Biophys . 2016 Dec.

Abstract

The significance of the essential trace element zinc for immune function has been known for several decades. Zinc deficiency affects immune cells, resulting in altered host defense, increased risk of inflammation, and even death. The micronutrient zinc is important for maintenance and development of immune cells of both the innate and adaptive immune system. A disrupted zinc homeostasis affects these cells, leading to impaired formation, activation, and maturation of lymphocytes, disturbed intercellular communication via cytokines, and weakened innate host defense via phagocytosis and oxidative burst. This review outlines the connection between zinc and immunity by giving a survey on the major roles of zinc in immune cell function, and their potential consequences in vivo.

Maares M, Haase H. Zinc and immunity: An essential interrelation. Arch Biochem Biophys. 2016;611:58-65. doi:10.1016/j.abb.2016.03.022

ZINC AS A GATEKEEPER OF IMMUNE FUNCTION

Published: Nutrients . 2017 Nov 25

Abstract

After the discovery of zinc deficiency in the 1960s, it soon became clear that zinc is essential for the function of the immune system. Zinc ions are involved in regulating intracellular signaling pathways in innate and adaptive immune cells. Zinc homeostasis is largely controlled via the expression and action of zinc "importers" (ZIP 1-14), zinc "exporters" (ZnT 1-10), and zinc-binding proteins. Anti-inflammatory and anti-oxidant properties of zinc have long been documented, however, underlying mechanisms are still not entirely clear. Here, we report molecular mechanisms underlying the development of a pro-inflammatory phenotype during zinc deficiency. Furthermore, we describe links between altered zinc homeostasis and disease development. Consequently, the benefits of zinc supplementation for a malfunctioning immune system become clear. This article will focus on underlying mechanisms responsible for the regulation of cellular signaling by alterations in zinc homeostasis. Effects of fast zinc flux, intermediate "zinc waves", and late homeostatic zinc signals will be discriminated. Description of zinc homeostasis-related effects on the activation of key signaling molecules, as well as on epigenetic modifications, are included to emphasize the role of zinc as a gatekeeper of immune function.

Wessels I, Maywald M, Rink L. Zinc as a Gatekeeper of Immune Function. Nutrients. 2017;9(12):1286. Published 2017 Nov 25. doi:10.3390/nu9121286

FUTURE PERSPECTIVES IN ADDRESSING THE GLOBAL ISSUE OF VITAMIN D DEFICIENCY

Published: Proc Nutr Soc . 2020 May

Abstract

Vitamin D is a fundamentally critical nutrient that the human body requires to function properly. It plays an important role in musculoskeletal health due to its involvement in the regulation of calcium and phosphorus. Having a low level of vitamin D in the body may be detrimental for a wide range of health outcomes, including risk of osteoporotic and stress fractures, risk of CVD and some cancers, and lowering of the capability of the immune system. Vitamin D is an unusual nutrient; it is not a vitamin, in the true sense of the word but a pro-hormone. The main source of vitamin D is UV exposure, not dietary intake. Interestingly, there are two forms of vitamin D, vitamin D2 and vitamin D3, both of which are metabolised into 25-hydroxyvitamin D (25(OH)D) in the liver, the biomarker of vitamin D status. Vitamin D deficiency is a global public health problem, especially amongst older people and ethnic minority groups. The newest publication from the UK Government's Public Health England Department recommends that vitamin D intake should be 10 µg daily and this recommendation compares well (albeit lower) with other guidelines such as the Institute of Medicine recommendation of 15 µg for those aged 1-70 years and 20 µg for those 70 years or over. Few countries, however, have a specific vitamin D policy to prevent deficiency in populations. Finland leads the way, demonstrating impressive results in reducing population-level vitamin D deficiency through mandatory food fortification programmes. Collaboration between academia, government and industry, including countries from varying latitudes, is essential to identify long-term solutions to the global issue of vitamin D deficiency. This paper provides a narrative review of the evidence related to the role of vitamin D deficiency in health outcomes, outlines controversies regarding setting levels of adequacy, identifies the prevalence of vitamin D deficiency across the globe, and identifies population-level strategies adopted by countries to prevent vitamin D deficiency.

Mendes MM, Charlton K, Thakur S, Ribeiro H, Lanham-New SA. Future perspectives in addressing the global issue of vitamin D deficiency. Proc Nutr Soc. 2020;79(2):246-251. doi:10.1017/S0029665119001538

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Serving Size: 3 capsules

Ingredient	Amount Per Serving	% Daily Value
Vitamin B6 (as pyridoxine HCL)	50 mg	2941%
Vitamin D3 (as cholecalciferol)	5000 IU	1250%
Vitamin C (as ascorbyl palmitate)	300 mg	333%
Magnesium BisGlycinate Chelate TRAACS®	500 mg (90 mg elemental)	21%
Selenium Glycinate TRAACS®	200 mcg	1110%
Zinc Bisglycinate Chelate TRAACS®	26 mg	236%

A proprietary blend of 900 mg the following natural ingredients: Organic olive leaf powder, Organic maitake mushroom powder, Shiitake mushroom powder, Reishi mushroom powder, Agaricus blazei mushroom powder, Organic ginger root powder, Organic licorice root powder, Andrographis powder, Arabinogalactan powder, Ashwagandha powder, and Astragalus powder. Other ingredients: Silicon dioxide, Magnesium stearate, vegetable capsule. Made with organic ingredients when possible.

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RESEARCH & DEVELOPMENT

ALLEVIATION OF SHOULDER INJURY RELATED TO VACCINE ADMINISTRATION (SIRVA) PAIN AND DISABILITY FOLLOWING COVID-19 VACCINE WITH CHIROPRACTIC BIOPHYSICS® (CBP®) METHODS: A CASE REPORT AND LONG-TERM FOLLOW-UP WITH GLOBAL IMPLICATIONS

Date & Journal: J Phys Ther Sci. 2023 Dec

Abstract

[Purpose] To present the dramatic improvement in posture, radiographic parameters and the alleviation of neck and severe shoulder pain related to shoulder injury associated with vaccine administration (SIRVA) after a COVID-19 injection with a shoulder mobility and posture rehabilitation program.

[Results] At 4-months, the patient reported no neck or shoulder pain. There was a 60% decrease in neck disability. The forward head decreased 34 mm, thoracic hyperkyphosis decreased 13°, and T1-T12 forward lean decreased 73 mm, among other radiographic parameters. Re-assessment after 26-months showed maintenance of the treatment induced posture/x-ray corrections and shoulder pain relief.

[Conclusion] This case demonstrates immediate and long-term improvement in a patient suffering from COVID-19 vaccine SIRVA, concomitant with neck pain and disability as well as significant radiographic postural/spinal deformity. These conditions all improved and were maintained at a 2 year follow-up without further treatment.

Haas JW, Oakley PA, Harrison DE. Alleviation of shoulder injury related to vaccine administration (SIRVA) pain and disability following COVID-19 vaccine with chiropractic biophysics® (CBP®) methods: a case report and long-term follow-up with global implic

REDUCTION OF THORACO-LUMBAR KYPHOSIS RESULTS IN THE ALLEVIATION OF LOW BACK PAIN IN AN ADOLESCENT BASKETBALL PLAYER: A CHIROPRACTIC BIOPHYSICS® (CBP®) CASE REPORT

Date & Journal: J Phys Ther Sci. 2023 Dec

Abstract

[Purpose] To present the case of a significant reduction in thoraco-lumbar deformity and alleviation of chronic low back pain in an otherwise healthy and active adolescent male basketball player.

[Results] There was a 12° improvement in the thoraco-lumbar deformity corresponding with the alleviation of chronic low back pains and near complete reduction in disability after 36 treatments over a 4-month period.

[Conclusion] This case adds to the growing literature showing the efficacy of the non-surgical spinal rehabilitative methods of Chiropractic Biophysics in improving spine alignment and relieving spinal pain syndromes. This case also demonstrates the importance of the routine screening for spine alignment via radiography in leading to proper biomechanical diagnosis and treatment.

Oakley PA, Haas JW, Harrison DE. Reduction of thoraco-lumbar kyphosis results in the alleviation of low back pain in an adolescent basketball player: a Chiropractic Biophysics® (CBP®) case report. J Phys Ther Sci. 2023 Dec;35(12):825-830. doi: 10.1589/jpt

TREATMENT OF COVID-19 PATIENTS WITH QUERCETIN: A PROSPECTIVE, SINGLE CENTER, RANDOMIZED, CONTROLLED TRIAL

Date & Journal: Turk J Biol . 2021 Aug 30.

Abstract

Scientific research continues on new preventive and therapeutic strategies against severe acute respiratory syndrome Coronavirus-2 (SARS-CoV-2). So far, there is no proven curative treatment, and a valid alternative therapeutic approach needs to be developed. This study is designed to evaluate the effect of quercetin in COVID-19 treatment. This was a single-centre, prospective randomized controlled cohort study. Routine care versus QCB (quercetin, vitamin C, bromelain) supplementation was compared between 429 patients with at least one chronic disease and moderate-to-severe respiratory symptoms. Demographic features, signs, laboratory results and drug administration data of patients were recorded. The endpoint was that QCB supplementation was continued throughout the follow-up period from study baseline to discharge, intubation, or death. The most common complaints at the time of hospital admission were fatigue (62.4%), cough (61.1%), anorexia (57%), thirst (53.7%), respiratory distress (51%) and chills (48.3%). The decrease in CRP and ferritin levels was higher in the QCB group (all Ps were < 0.05). In the QCB group, the increase in platelet and lymphocyte counts was higher (all Ps were < 0.05). QCB did not reduce the risk of events during follow-up. Adjustments for statistically significant parameters, including the lung stage, use of favipiravir and presence of comorbidity did not change the results. While there was no difference between the groups in terms of event frequency, the QCB group had more advanced pulmonary findings. QCB supplement is shown to have a positive effect on laboratory recovery. While there was no difference between the groups in terms of event frequency, QCB supplement group had more advanced pulmonary findings, and QCB supplement is shown to have a positive effect on laboratory recovery/results. Therefore, we conclude that further studies involving different doses and plasma level measurements are required to reveal the dose/response relationship and bioavailability of QCB for a better understanding of the role of QCB in the treatment of SARS CoV-2.

Önal H, Arslan B, Üçüncü Ergun N, Topuz Ş, Yilmaz Semerci S, Kurnaz ME, Molu YM, Bozkurt MA, Süner N, Kocataş A. Treatment of COVID-19 patients with quercetin: a prospective, single center, randomized, controlled trial. Turk J Biol. 2021 Aug 30;45(4):518-

DIETARY SUPPLEMENTS FOR TREATMENT OF ENDOMETRIOSIS: A REVIEW

Date & Journal: Acta Biomed. 2022 Mar 14.

Abstract

As search for optimal therapy continues for endometriosis, aid of dietary supplements is gaining attention. Supplements can be used for their anti-inflammatory, anti-oxidant, anti-proliferative and immune modulatory characteristics. We reviewed the literature, evaluated and synthesized effects of vitamin D, zinc, magnesium, omega 3, propolis, quercetin, curcumin, N-acetylcysteine, probiotics, resveratrol, alpha lipoic acid, vitamin C, vitamin E, selenium and epigallocatechin-3-gallate. Based on results of in vitro, animal and human studies, it might be safe to say that dietary supplements can be used as a complementary treatment for endometriosis.

Yalçın Bahat P, Ayhan I, Üreyen Özdemir E, İnceboz Ü, Oral E. Dietary supplements for treatment of endometriosis: A review. Acta Biomed. 2022 Mar 14;93(1):e2022159. doi: 10.23750/abm.v93i1.11237. PMID: 35315418; PMCID: PMC8972862.

POTENTIAL OF NATURAL PRODUCTS IN THE TREATMENT OF MYOCARDIAL INFARCTION: FOCUS ON MOLECULAR MECHANISMS

Date & Journal: Crit Rev Food Sci Nutr . 2022 Jan 3.

Abstract

Although conventional drugs are widely used in the prevention and treatment of cardiovascular disease (CVD), they are being used less frequently due to concerns about possible side effects over the long term. There has been a renewed research interest in medicinal plant products, and their role in protecting the cardiovascular system and treating CVD, which are now being considered as potential alternatives to modern drugs. The most important mechanism causing damage to the myocardium after heart attack and reperfusion, is increased levels of free radicals and oxidative stress. Therefore, treatment approaches often focus on reducing free radicals or enhancing antioxidant defense mechanism. It has been previously reported that bioactive natural products can protect the heart muscle in myocardial infarction (MI). Since these compounds are readily available in fruits and vegetables, they could prevent the risk of MI if they are consumed daily. Although the benefits of a healthy diet are well known, many scientific studies have focused on whether pure natural compounds can prevent and treat MI. In this review we summarize the effects of curcumin, resveratrol, quercitin, berberine, and tanshinone on MI and CVD, and focus on their proposed molecular mechanisms of action.

Sheida A, Taghavi T, Shafabakhsh R, Ostadian A, Razaghi Bahabadi Z, Khaksary Mahabady M, Hamblin MR, Mirzaei H. Potential of natural products in the treatment of myocardial infarction: focus on molecular mechanisms. Crit Rev Food Sci Nutr. 2022 Jan 3:1-18

Objective Nutritional / Metabolic Questionnaire

Name: _____ **Date:** _____

Do you Eat:	
Do you eat 5 or more servings of vegetables in a day?	Yes or No
Do you eat 4 or more servings of fruit in a day?	Yes or No
Do you drink more than 1 sugar sweetened beverage (sodas energy drinks, sweetened tea) in a day?	Yes or No
Do you drink more than 2 cups of coffee in a day?	Yes or No
Do you eat more than 3 servings candy, cookies, cakes, sweetened rolls in a week?	Yes or No
Do you eat bread all 7 days of the week?	Yes or No
Do you eat whole grain bread & pasta?	Yes or No
Do you eat more than 2 servings a day of packaged snack foods i.e.-potato chips, crackers, corn chips, Cheetos etc. daily?	Yes or No
Do you eat more than 2 packaged entrees and side dishes daily?	Yes or No
Do you purchase/eat regular store bought meat (not grass-fed)?	Yes or No
Do you purchase/eat farm raised fish (not wild caught)?	Yes or No
Do you eat almonds, walnuts, cashews, pistachio, macadamia, pecans more than 2 times a week?	Yes or No
Do you eat chia, flaxseed, or hempseed more than 5 times week?	Yes or No
Total Yes's :	

Cooking	
What oils do you cook with? ☐ olive oil ☐ coconut oil ☐ grass-fed butter ☐ corn oil ☐ sunflower oil ☐ vegetable oil	
Do you eat Yogurt?	Yes or No
Do you consume cheese or milk products?	Yes or No

Objective Nutritional / Metabolic Questionnaire

Do you cook at home more than 5 times in a week?	Yes or No
Total Yes's :	

Do you feel?	
Do you have muscle cramping?	Yes or No
Do you have restless leg syndrome?	Yes or No
Are you nervous or have anxiety?	Yes or No
Do you get headaches often?	Yes or No
Are you constipated frequently?	Yes or No
Do you suffer from osteoporosis or osteopenia?	Yes or No
Do you suffer from chronic pain?	Yes or No
Have you been diagnosed with an autoimmune disease?	Yes or No
Do you have muscle stiffness or pain?	Yes or No
Total Number of Yes':	

Exercise	
Do you exercise?	Yes or No
Do you exercise 5 days a week?	Yes or No
What types of exercises ?	
Are you more of a couch potato?	Yes or No
Do you ever get sore from exercising?	Yes or No
Total Number of Yes':	

Immune	
Do you get a cold or the flue each season?	Yes or No
Do you believe that you have a strong immune system?	Yes or No
Do you have more than 1 bowl movement in a day?	Yes or No
Do you have allergies ?	Yes or No

Objective Nutritional / Metabolic Questionnaire

Do you get a sore throat and/or stuffy/runny nose more than once a month?	Yes or No
Do you eat dairy products – ice cream?	Yes or No
Do you eat sugar foods? i.e. candy/cakes	Yes or No
Would you like to strength your immune response?	Yes or No
Total Number of Yes':	

Cardio-Metabolic Health	
Are you currently diagnosed with ?	
Cholesterol Problems?	Yes or No
High Blood Pressure	Yes or No
Diabetes ?	Yes or No
Pre-diabetes ?	Yes or No
Metabolic Syndrome?	Yes or No
Any other diagnosis please list below:	

Do you take medications for:	
Cholesterol	Yes or No
High Blood Pressure	Yes or No
Diabetes / Pre-diabetes?	Yes or No
Total Yes's :	
Please list all medications:	

Are you under the care of a physician for these conditions?
If yes, who is your physician currently managing these conditions?(Name, Address, Phone #)

Objective Nutritional / Metabolic Questionnaire

How important is it to you function at your optimum 100% health? On a scale of 1-10 (10 being ready to change today) _____

How ready are to change? On a scale of 1-10 (10 being ready to change today) _____

_____ Your Diet
_____ Supplementation
_____ Consistent Chiropractic Care
_____ Exercise

For Practitioner Use Only:

Note- Yes = 1 point No= 0 points (ex. 5 yes' = 5 points)

	Totals:	**Supplement Recommendations**
Do you eat?		> 5 **Greens- If yes is the primary answer this shows that the diet may be a very acidic diet. To counter balance the acidity, we recommend the Greens product which is an alkaline superfood which will help improve digestion, immunity, inflammation, energy, and aiding in weight loss.** **Turmeric- With the increased amount of processed foods and sugary foods the body is undergoing an overwhelming amount of inflammation which could lead to pain, chronic disease, or autoimmune disease. Turmeric helps the body fight inflammation with the curcuminoids, ginger, curcumin, bromelain, and saffron. Turmeric will also help if the patient has any current pain or chronic conditions by supporting the body with an anti- inflammatory product.**
Cooking		> 2 & corn oil & vegetable oil are chosen **With the increase in saturated fats, eating out, and the need for energy the patient is a great candidate for the Ultra Amino Energy.** **Why? This supplement is full of amino acids specifically L-arginine which is a vasodilator. This is why it is great for our cardiovascular system. It is also full of B- vitamins that will supply the patients with energy & no crash. Educate patient on cooking methods to incorporate more healthy fats. Also, great to improve brain function.**

Objective Nutritional / Metabolic Questionnaire

Do you feel		>1 **Minerals Chelated- This formula uses chelated minerals with Albion and TRACCS (The Real Amino Acid Chelate System) a highly bioavailable and absorptive form of the minerals. This supplement is formulated with ferrous gluconate (iron) to aid with hemoglobin formation, an oxygen carrier, muscle function, and brain function. This supplement has magnesium which helps prevent muscle aches and spasms, helps increase energy, calms nerves and anxiety, aids digestion by relieving constipation, important in heart health, and helps prevent migraine headaches. These minerals are also essential in building & maintaining strong bones.** **Turmeric- Turmeric helps the body fight inflammation which is the underlying root of a lot of diseases. Patients who suffer from chronic pain, autoimmune disease, and muscle stiffness/pain may benefit from this supplement by adding in an anti-inflammatory product like our Turmeric product.**
Exercise		>2 **Turmeric- With turmeric being an anti-inflammatory supplement, it can be great for post work out inflammation and recovery/ soreness .** **Type One Collagen- Working out helps strengthen our muscles, tendons, and ligaments. Type One Collagen Protein is important for growth and maintenance of tendons and ligaments. It also helps with joint health and improves our muscle mass.** **Ultra Amino Energy- Aminos are a great aid for the cardiovascular system. By adding these into your daily supplement regiment it can be a great aid in improving stamina during a working out and provide you sustained energy throughout the day without any crash or added sugars!** **Minerals - Helps with cramping during and after exercise. Great for bone health to keep bones strong!**
Immune		< 2 **Mega Immune- This is a daily immune product that helps maintain the integrity of the immune system by a synergistic blend of ingredients. This product is a great immune support supplement to keep the immune system strong all year long.**

Objective Nutritional / Metabolic Questionnaire

Cardio-Metabolic Health		> 2 **ALL (Greens, Minerals, Turmeric, Type 1 Collagen Protein, & Ultra Amino Energy) SUPPLEMENTS TO SUPPORT THE BODY & CURRENT DISEASES.**

Dr. Mark Cymerint D.C. Recommendations:

For Patient: _____

Supplement Recommendations:

- □ **Total Turmeric -** _____
- □ **Chelated Minerals -** _____
- □ **Type-1 Collagen -** _____
- □ **Ultra Amino Energy -** _____
- □ **Ultra Amino Energy (Caffeine Free) -** _____
- □ **Alkaline Greens -** _____
- □ **Mega Immune -** _____

Exercise Recommendations:

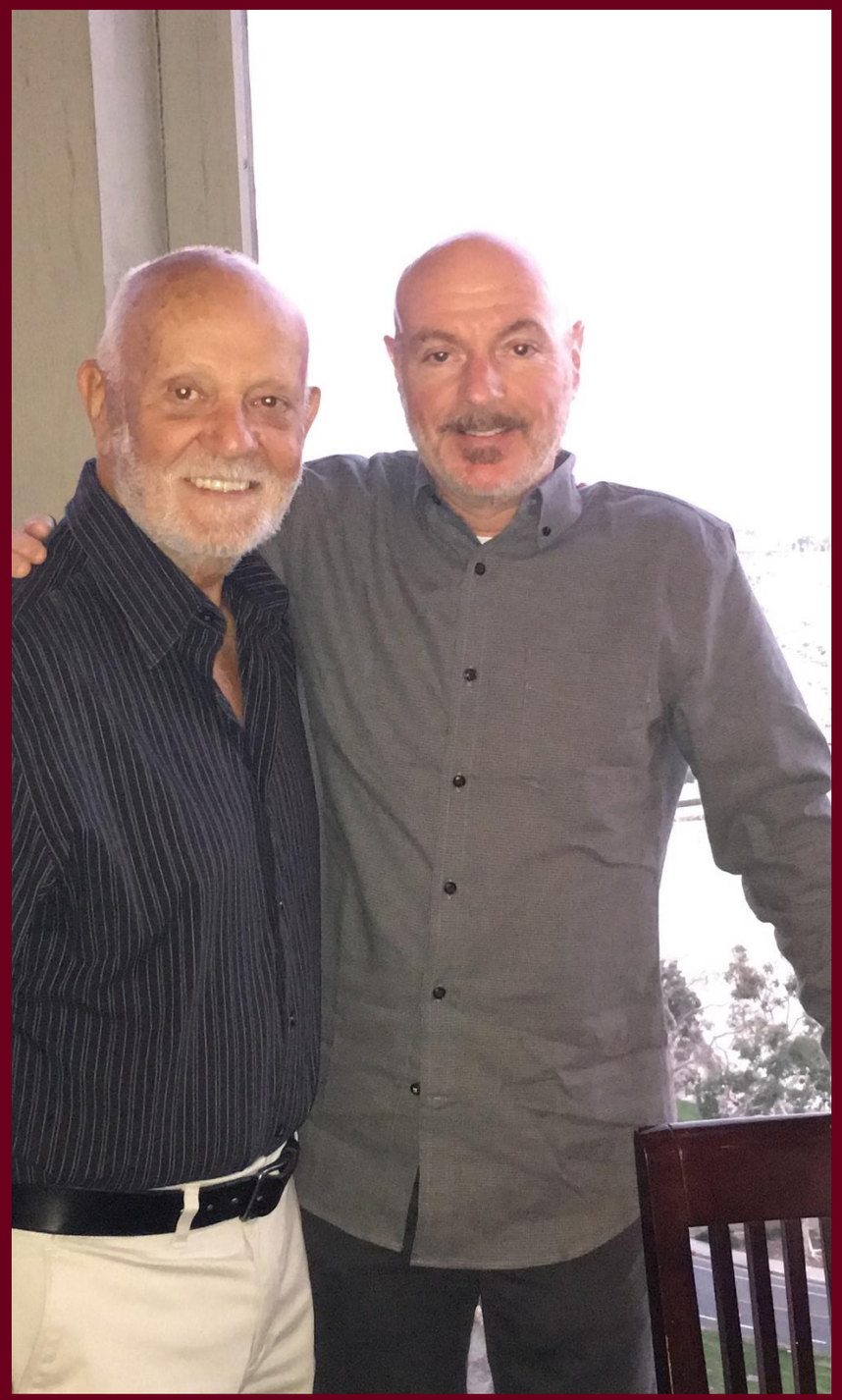
Dietary Recommendations:

CASE REPORT

CHIROPRACTIC PATIENT
JAN. 2016

- COMORBIDITIES –
HEIGHT: 5’8”
WEIGHT: 225LBS (OBESITY)
MEDS: 5 DIFFERENT CARDIOVASCULAR MEDS.
LIFESTYLE: SEDENTARY
DIET: POOR
MENTAL HEALTH: DEPRESSION

CASE REPORT



CHIROPRACTIC PATIENT
DEC. 2016

- COMORBIDITIES –
HEIGHT: 5’8”
WEIGHT: 153LBS (WNL)
MEDS: REPLACED BY 6 DIETARY SUPPLEMENTS DAILY
LIFESTYLE: ACTIVE (WALKS 3-4 MILES PER DAY)
DIET: VERY GOOD. REDUCED SUGAR, DAIRY, CARBS.
MENTAL HEALTH: STABLE AND HEALTHY

ADDITIONAL IMMUNE SYSTEM RESEARCH 2020

CRITICAL CARE MANAGEMENT OF ADULTS WITH COMMUNITY-ACQUIRED SEVERE RESPIRATORY VIRAL INFECTION

Published: Intensive Care Med | 2020 Feb.

Abstract

With the expanding use of molecular assays, viral pathogens are increasingly recognized among critically ill adult patients with community-acquired severe respiratory illness; studies have detected respiratory viral infections (RVIs) in 17-53% of such patients. In addition, novel pathogens including zoonotic coronaviruses like the agents causing Severe Acute Respiratory Syndrome (SARS), Middle East Respiratory Syndrome (MERS) and the 2019 novel coronavirus (2019 nCoV) are still being identified. Patients with severe RVIs requiring ICU care present typically with hypoxemic respiratory failure. Oseltamivir is the most widely used neuraminidase inhibitor for treatment of influenza; data suggest that early use is associated with reduced mortality in critically ill patients with influenza. At present, there are no antiviral therapies of proven efficacy for other severe RVIs. Several adjunctive pharmacologic interventions have been studied for their immunomodulatory effects, including macrolides, corticosteroids, cyclooxygenase-2 inhibitors, sirolimus, statins, anti-influenza immune plasma, and vitamin C, but none is recommended at present in severe RVIs. Evidence-based supportive care is the mainstay for management of severe respiratory viral infection. Non-invasive ventilation in patients with severe RVI causing acute hypoxemic respiratory failure and pneumonia is associated with a high likelihood of transition to invasive ventilation. Limited existing knowledge highlights the need for data regarding supportive care and adjunctive pharmacologic therapy that is specific for critically ill patients with severe RVI. There is a need for more pragmatic and efficient designs to test different therapeutics both individually and in combination.

Arabi YM, Fowler R, Hayden FG. Critical care management of adults with community-acquired severe respiratory viral infection. Intensive Care Med. 2020;46(2):315-328. doi:10.1007/s00134-020-05943-5

PLATELET-TO-LYMPHOCYTE RATIO IS ASSOCIATED WITH PROGNOSIS IN PATIENTS WITH CORONAVIRUS DISEASE-19

Published: J Med Virol . 2020 Sep

Abstract

Since December 2019, novel coronavirus infected pneumonia emerged in Wuhan city and rapidly spread throughout China. In severe novel coronavirus pneumonia cases, the number of platelets, their dynamic changes during the treatment, platelet-to-lymphocyte ratio (PLR) were a concern. We sought to describe the platelet feature of these cases. Single-center case series of the 30 hospitalized patients with confirmed coronavirus disease (COVID)-19 in Huizhou municipal central hospital from January 2020 to February 2020 were retrospectively analyzed. Demographic, clinical, blood routine results, other laboratory results, and treatment data were collected and analyzed. Outcomes of severe patients and nonsevere patients were compared. Univariate analysis showed that: age, platelet peaks, and PLR at peak platelet were the influencing factors in severe patients, multivariate analysis showed that the PLR value at peak platelet during treatment was an independent influencing factor in severe patients. The average hospitalization day of patients with platelet peaks during treatment was longer than those without platelet peaks ($P < .05$). The average age of patients with platelet peaks during treatment was older than those without platelet peaks ($P < .05$). The patients with significantly elevated platelets during treatment had longer average hospitalization days. And the higher PLR of patients during treatment had longer average hospitalization days. Single-center case series of the 30 hospitalized patients with confirmed COVID-19 in Huizhou Municipal Central Hospital, presumed that the number of platelets and their dynamic changes during the treatment may have a suggestion on the severity and prognosis of the disease. The patient with markedly elevated platelets and longer average hospitalization days may be related to the cytokine storm. The PLR of patients means the degree of cytokine storm, which might provide a new indicator in the monitoring in patients with COVID-19.

Qu R, Ling Y, Zhang YH, et al. Platelet-to-lymphocyte ratio is associated with prognosis in patients with coronavirus disease-19 [published online ahead of print, 2020 Mar 17]. J Med Virol. 2020;10.1002/jmv.25767. doi:10.1002/jmv.25767

GUIDE TO THE FORENSIC PATHOLOGY PRACTICE ON DEATH CASES RELATED TO CORONA VIRUS DISEASE 2019 （COVID-19)

Published Review: Fa Yi Xue Za Zhi . 2020 Feb

Abstract

Autopsy is of great significance to the elucidation of the pathological changes, pathogeneses and causes of death of corona virus disease 2019 （COVID-19） and can provide theoretical basis for more scientific and accurate prevention and control of the outbreak. Based on related laws and regulations, such as the Law of the People's Republic of China on Prevention and Control of Infectious Diseases, the clinical manifestations and epidemiological characteristics of COVID-19, and the related guidelines on the prevention and control of the outbreak, combined with the practical work of forensic pathology examination, the Guide to the Forensic Pathology Practice on Death Cases Related to Corona Virus Disease 2019 （COVID-19） （Trial Draft） has been developed. This guide includes information on the background investigation of the cases, autopsy room requirements, personal prevention and protections, external examinations, autopsy, auxiliary examinations, and so on. This guide can be used as a reference by forensic and pathological examination institutions, as well as examination staff.

Mao DM, Zhou N, Zheng D, et al. Guide to the Forensic Pathology Practice on Death Cases Related to Corona Virus Disease 2019 （COVID-19） （Trial Draft. Fa Yi Xue Za Zhi. 2020;36(1):6-5. doi:10.12116/j.issn.1004-5619.2020.01.003

REVIEW AND PROSPECT OF PATHOLOGICAL FEATURES OF CORONA VIRUS DISEASE

Published Review: Fa Yi Xue Za Zhi . 2020 Feb

Abstract

Since 2003, coronavirus has caused multiple major public health events that resulted in global epidemics, such as severe acute respiratory syndrome （SARS）, Middle East respiratory syndrome （MERS） and corona virus disease 2019 （COVID-19）. Especially since COVID-19 outbroke in Wuhan, Hubei, in December 2019, coronavirus has had a significant impact on people's health and lives. But so far, the pathological diagnosis of COVID-19 has been relatively deficient： it is still confined to the pathological findings of punctured organs, and the majority of medical workers have poor awareness of its pathological characteristics. The COVID-19, as same as SARS and MERS, is caused by coronaviruses and can cause viral pneumonia. They have certain similarities. This article comprehensively reviews the pathological features observed in the autopsies of the aforementioned three diseases, in order to provide reference to the analysis of pathological changes of COVID-19.

Wang HJ, Du SH, Yue X, Chen CX. Review and Prospect of Pathological Features of Corona Virus Disease. Fa Yi Xue Za Zhi. 2020;36(1):16-20. doi:10.12116/j.issn.1004-5619.2020.01.004

PUTATIVE ROLES OF VITAMIN D IN MODULATING IMMUNE RESPONSE AND IMMUNOPATHOLOGY ASSOCIATED WITH COVID-19

Virus Res . 2021 Jan 15

Abstract

The first incidence of COVID-19 was reported in the Wuhan city of Hubei province in China in late December 2019. Because of failure in timely closing of borders of the affected region, COVID-19 spread across like a wildfire through air travel initiating a pandemic. It is a serious lower respiratory track viral infection caused by highly contagious, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2). Coronavirus including COVID-19 causing SARS-CoV-2 causes zoonotic diseases and thought to be originated from bats. Since its first incidence, the virus has spread all across the world, causing serious human casualties, economic losses, and disrupting global supply chains. As with SARS-CoV, COVID-19 causing SARS-CoV-2 follows a similar path of airborne infection but is less lethal and more infectious than SARS and MERS. This review focusses on the pathogenesis of SARS-CoV-2, especially on the dysfunctional immune responses following a cytokine storm in severely affected persons. The mode of entry of SARS-CoV-2 is via the angiotensin converting enzyme 2 (ACE-2) receptors present on the epithelial lining of lungs, gastrointestinal tract, and mucus membranes. Older persons with weaker immune systems and associated co-morbidities are more vulnerable to have dysfunctional immune responses, as most of them concomitantly have severe hypovitaminosis D- consequently, causing severe damage to key organs of the body including lungs and the cardiovascular system. A vast majority of persons who were entered to intensive care units and died were found to have had severe vitamin D deficiency; thus, this area must be investigated seriously. In addition, this article assesses the role of vitamin D in reducing the risk of COVID-19. Vitamin D is a key regulator of the renin-angiotensin system that is exploited by SARS-CoV-2 for entry into the host cells. Further, vitamin D modulates multiple mechanisms of the immune system to contain the virus that includes dampening the entry and replication of SARS-CoV-2, reduces concentration of pro-inflammatory cytokines and increases levels of anti-inflammatory cytokines, enhances the production of natural antimicrobial peptide and activates defensive cells such as macrophages that could destroy SARS-CoV-2. Thus, this article provides the urgency of needed evidences through large population based randomized controlled trials and ecological studies to evaluate the potential role of vitamin D in COVID-19.

Kumar R, Rathi H, Haq A, Wimalawansa SJ, Sharma A. Putative roles of vitamin D in modulating immune response and immunopathology associated with COVID-19. Virus Res. 2021 Jan 15;292:198235. doi: 10.1016/j.virusres.2020.198235. Epub 2020 Nov 21. PMID: 33232783; PMCID: PMC7680047.

THREE NOVEL PREVENTION, DIAGNOSTIC, AND TREATMENT OPTIONS FOR COVID-19 URGENTLY NECESSITATING CONTROLLED RANDOMIZED TRIALS

Med Hypotheses . 2020 Oct

Abstract:

Purpose: Asymptomatic or minimally symptomatic infection with COVID-19 can result in silent transmission to large numbers of individuals, resulting in expansion of the pandemic with a global increase in morbidity and mortality. New ways of screening the general population for COVID-19 are urgently needed along with novel effective prevention and treatment strategies.

Hypothesis: A hypothetical three-part prevention, diagnostic, and treatment approach based on an up-to-date scientific literature review for COVID-19 is proposed. Regarding diagnosis, a validated screening questionnaire and digital app for COVID-19 could help identify individuals who are at risk of transmitting the disease, as well as those at highest risk for poor clinical outcomes. Global implementation and online tracking of vital signs and scored questionnaires that are statistically validated would help health authorities properly allocate essential health care resources to test and isolate those at highest risk for transmission and poor outcomes. Second, regarding prevention, no validated protocols except for physical distancing, hand washing, and isolation exist, and recently ivermectin has been published to have anti-viral properties against COVID-19. A randomized trial of ivermectin, and/or nutraceuticals that have been published to support immune function including glutathione, vitamin C, zinc, and immunomodulatory supplements (3,6 Beta glucan) could be beneficial in preventing transmission or lessening symptomatology but requires statistical validation. Third, concerning treatment, COVID-19 induced inflammation and "cytokine storm syndrome" with hemophagocytic lymphohistiocytosis (HLH)/Macrophage Activation Syndrome (MAS) have resulted in extreme morbidity and mortality in those with certain comorbidities, secondary to "acute respiratory distress syndrome" (ARDS) and multiorgan dysfunction with disseminated intravascular coagulation (DIC).Deficiency in red blood cell, serum and alveolar glutathione has been published in the medical literature for ARDS, as well as viral and bacterial pneumonias, resulting from increased levels of free radical/oxidative stress.

Conclusion and implications: A three-part prevention, diagnostic, and treatment plan is proposed for addressing the severe complications of COVID-19. Digital monitoring of symptoms to clinically diagnose early exposure and response to treatment; prevention with ivermectin as well as nutritional therapies that support a healthy immune response; treatment with anti-inflammatory therapies that block NF-κB and activate Nrf2 pathways, as well as novel therapies that address COVID-19 pneumonia and ARDS with DIC including anticoagulation and/or novel respiratory therapies with or without acetazolamide and sildenafil. These three broad-based interventions urgently need to be subjected to randomized, controlled trials.

Horowitz RI, Freeman PR. Three novel prevention, diagnostic, and treatment options for COVID-19 urgently necessitating controlled randomized trials. Med Hypotheses. 2020 Oct;143:109851. doi: 10.1016/j.mehy.2020.109851. Epub 2020 May 22. PMID: 32534175; PMCID: PMC7242962.

RETEST POSITIVE FOR SARS-COV-2 RNA OF "RECOVERED" PATIENTS WITH COVID-19: PERSISTENCE, SAMPLING ISSUES, OR RE-INFECTION?

J Med Virol . 2020 Nov.

Abstract

"Retest Positive" for severe acute respiratory syndrome-related coronavirus-2 (SARS-CoV-2) from "recovered" coronavirus disease-19 (COVID-19) has been reported and raised several important questions for this novel coronavirus and COVID-19 disease. In this commentary, we discussed several questions: (a) Can SARS-CoV-2 re-infect the individuals who recovered from COVID-19? This question is also associated with other questions: whether or not SARS-CoV-2 infection induces protective reaction or neutralized antibody? Will SARS-CoV-2 vaccines work? (b) Why could some recovered patients with COVID-19 be re-tested positive for SARS-CoV-2 RNA? (c) Are some recovered patients COVID-19 with re-testing positive for SARS-CoV-2 RNA infectious? and (d) How should the COVID-19 patients with retest positive for SARS-CoV-2 be managed?

Kang H, Wang Y, Tong Z, Liu X. Retest positive for SARS-CoV-2 RNA of "recovered" patients with COVID-19: Persistence, sampling issues, or re-infection? J Med Virol. 2020 Nov;92(11):2263-2265. doi: 10.1002/jmv.26114. Epub 2020 Jun 9. PMID: 32492212; PMCID: PMC7300489.

A NEW POSITIVE SARS-COV-2 TEST MONTHS AFTER SEVERE COVID-19 ILLNESS: REINFECTION OR INTERMITTENT VIRAL SHEDDING?

BMJ Case Rep . 2021 Feb 4.

Abstract

We present a case of a patient who had a history of severe coronavirus disease (COVID-19) 4 months prior to this current presentation and, after a long asymptomatic period, subsequently tested positive for severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by a RNA PCR assay, after several interval negative SARS-CoV-2 RNA tests. We present this potential case of SARS-CoV-2 reinfection in order to incite discussion around differentiating persistent infection with intermittent viral shedding and reinfection, as well as to discuss evolving knowledge and approaches to the clinical management, follow-up molecular testing and treatment of COVID-19 reinfection.

Tuan J, Spichler-Moffarah A, Ogbuagu O. A new positive SARS-CoV-2 test months after severe COVID-19 illness: reinfection or intermittent viral shedding? BMJ Case Rep. 2021 Feb 4;14(2):e240531. doi: 10.1136/bcr-2020-240531. PMID: 33542020; PMCID: PMC8098910.

CYTOKINE STORM INDUCED BY SARS-COV-2 INFECTION: THE SPECTRUM OF ITS NEUROLOGICAL MANIFESTATIONS

Cytokine . 2021 Feb

Abstract

The new coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), can trigger a hyperinflammatory state characterized by elevated cytokine levels known as hypercytokinemia or cytokine storm, observed most often in severe patients. Though COVID-19 is known to be a primarily respiratory disease, neurological complications affecting both the central and peripheral nervous systems have also been reported. This review discusses potential routes of SARS-CoV-2 neuroinvasion and pathogenesis, summarizes reported neurological sequelae of COVID-19, and examines how aberrant cytokine levels may precipitate these complications. Clarification of the pathogenic mechanisms of SARS-CoV-2 is needed to encourage prompt diagnosis and optimized care. In particular, identifying the presence of cytokine storm in patients with neurological COVID-19 manifestations will facilitate avenues for treatment. Future investigations into aberrant cytokine levels in COVID-19 patients with neurological symptoms as well as the efficacy of cytokine storm-targeting treatments will be critical in elucidating the pathogenic mechanisms and effective treatments of COVID-19.

Thepmankorn P, Bach J, Lasfar A, Zhao X, Souayah S, Chong ZZ, Souayah N. Cytokine storm induced by SARS-CoV-2 infection: The spectrum of its neurological manifestations. Cytokine. 2021 Feb;138:155404. doi: 10.1016/j.cyto.2020.155404. Epub 2020 Dec 11. PMID: 33360025; PMCID: PMC7832981.

A NETWORK-BASED ANALYSIS REVEALS THE MECHANISM UNDERLYING VITAMIN D IN SUPPRESSING CYTOKINE STORM AND VIRUS IN SARS-COV-2 INFECTION

Front Immunol . 2020 Dec 9

Abstract

Background: SARS-CoV-2 causes ongoing pandemic coronavirus disease of 2019 (COVID-19), infects the cells of the lower respiratory tract that leads to a cytokine storm in a significant number of patients resulting in severe pneumonia, shortness of breathing, respiratory and organ failure. Extensive studies suggested the role of Vitamin D in suppressing cytokine storm in COVID-19 and reducing viral infection; however, the precise molecular mechanism is not clearly known. In this work, bioinformatics and systems biology approaches were used to understand SARS-CoV-2 induced cytokine pathways and the potential mechanism of Vitamin D in suppressing cytokine storm and enhancing antiviral response.

Conclusion: This comprehensive study identified the pathways associated with cytokine storm in SARS-CoV-2 infection. The proposed underlying mechanism of Vitamin D could be promising in suppressing the cytokine storm and inducing a robust antiviral response in severe COVID-19 patients. The finding in this study urgently needs further experimental validations for the suitability of Vitamin D in combination with IFN-α to control severe COVID-19.

Ahmed F. A Network-Based Analysis Reveals the Mechanism Underlying Vitamin D in Suppressing Cytokine Storm and Virus in SARS-CoV-2 Infection. Front Immunol. 2020 Dec 9;11:590459. doi: 10.3389/fimmu.2020.590459. PMID: 33362771; PMCID: PMC7756074.

DECODING THE SILENT WALK OF COVID-19: HALTING ITS SPREAD USING OLD BULLETS

Biomed Pharmacother . 2021 Jan

Abstract

Severe acute respiratory syndrome (SARS) develops within 3-14 days when CoV2 invades epithelial, myeloid cells in the nasopharynx and pneumocytes in the respiratory tract through angiotensin converting enzyme (ACE2). Infection swiftly disseminates to gastrointestinal, cardiovascular, renal organs as well as immune system to deregulate their normal functioning through unique and distinct mechanisms. The health system and economy has been intensely thwarted by the rapid spread and exorbitant mortality caused by COVID-19 disease across the globe. The acute progression of the disease and high infection rate pose an enormous challenge for its therapeutic management and critical care. The viral structure, genome and proteome have been deciphered which yielded cues for targeting already available therapeutic entities. More than 200 compounds have been screened and till date approximately 69 therapeutic agents are undergoing clinical trials across the world. Among these, Remdesivir (RMD), chloroquine (CQ), hydroxychloroquine (HCQ), noscapine (NOS) and heparin have demonstrated fairly promising results in preclinical and clinical studies. Recently, RMD has been approved by USFDA for the management of COVID 19. However, intense research is going on to screen and ace the 'magic bullets' for the management of SARS-CoV2 infection worldwide. The current review illustrates the plausible therapeutic targets in SARS-CoV2 important for inhibition of virus cycle. In addition, the role of RMD, CQ, HCQ, NOS and heparin in combating infection has been addressed. The importance of vitamin C and D supplements as adjunct therapies in the prevention of SARS-CoV2 virus infection have also been summarized.

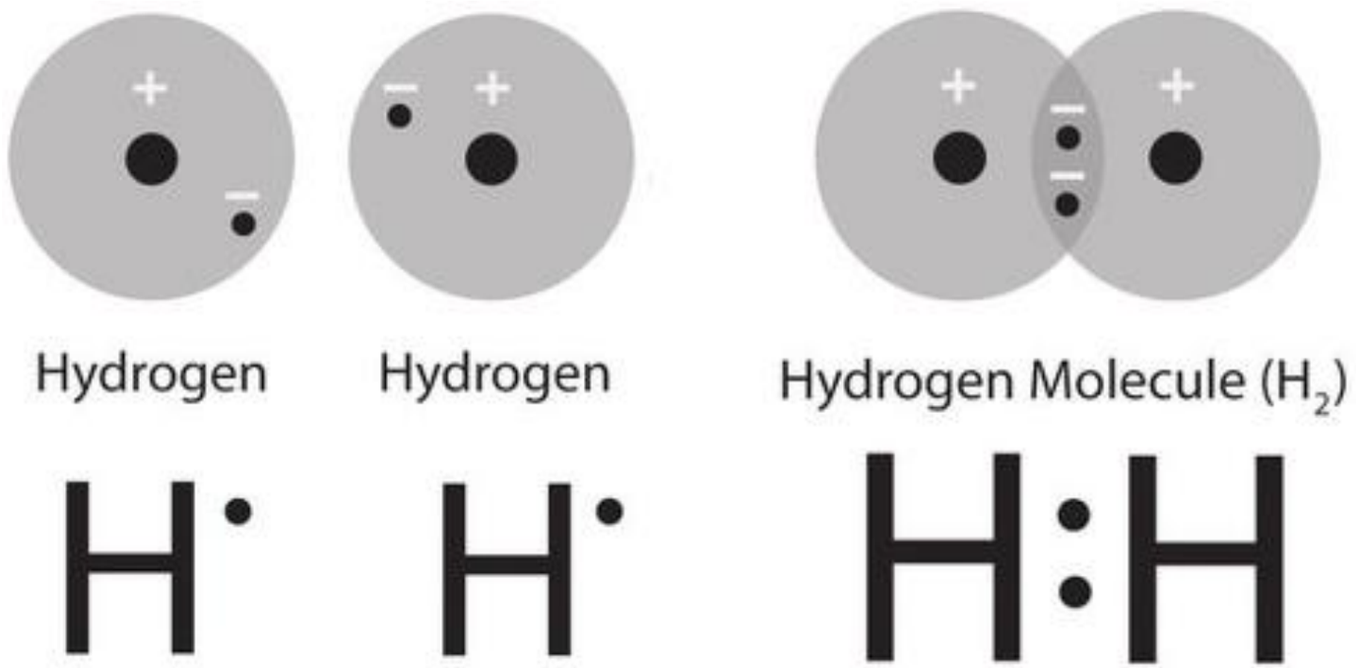
Kumar M, Madan J, Sodhi RK, Singh SB, Katyal A. Decoding the silent walk of COVID-19: Halting its spread using old bullets. Biomed Pharmacother. 2021 Jan;133:110891. doi: 10.1016/j.biopha.2020.110891. Epub 2020 Oct 19. PMID: 33227700; PMCID: PMC7572089.

II. BASIC SCIENCE (NUTRITION)

D. IMMUNE SYSTEM RESEARCH
   a) Recent studies from the NIH/PubMed
   b) Nutritional options
   c) Objective nutritional questionnaire
E. WATER
   a) Molecular hydrogen, constipation, ionization
   b) Filtration and nutritional benefits
   c) Water pH & safety
F. EVIDENCE BASED DIET RELATED RESEARCH
   a) Intermittent Fasting
   b) Ketogenic Diet
   c) Plant Based Nutrition

MOLECULAR HYDROGEN

- The chemical formula H2:
  - Composed of (2) bonded hydrogen atoms
  - The smallest molecule in existence
  - Its size enables molecular hydrogen to be dispersed readily in the body & cross through the blood/brain barrier.



MOLECULAR HYDROGEN

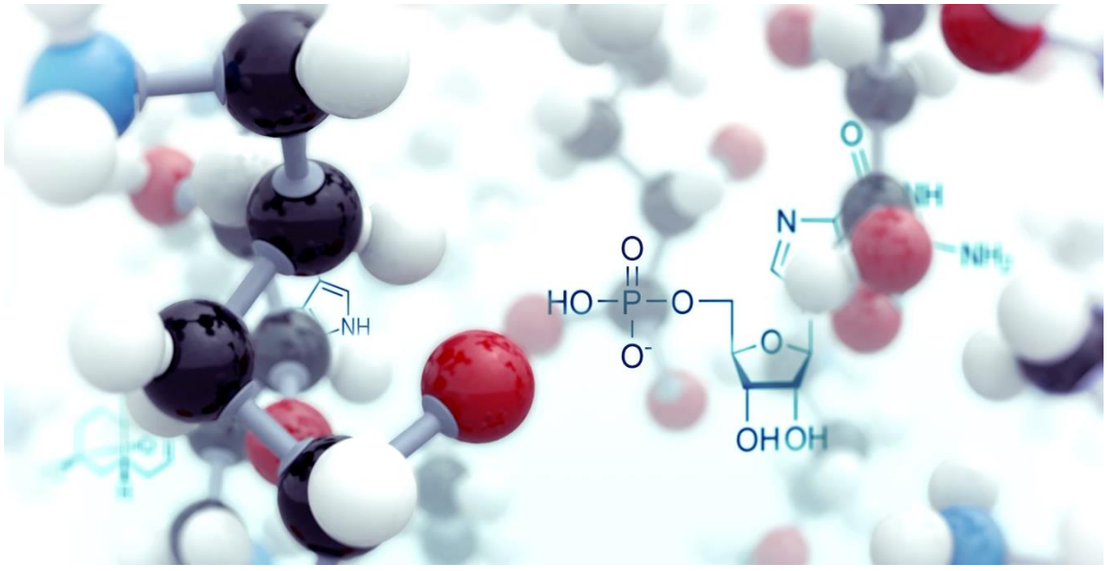
- The smallest element and lightest molecule in the universe

- Contains two (2) protons and two (2) electrons, thus making it neutrally-charged.

- It can affect our bodies at a cellular level. With antioxidant and cytoprotective properties, molecular hydrogen is capable of entering the energy-generating mitochondria of our cells, and mopping up any unwanted free radicals, therefore boosting our overall well-being.

- Hydrogen-rich ionized alkaline water has a negative *ORP (Oxidation Reduction Potential)* to counter the positive ORP of our degenerating cells and oxidization of our bodies as we become older.

MOLECULAR HYDROGEN BENEFITS



- Reduced inflammation
- Pain relief
- Pain relief in joints
- Decelerated aging process
- Decreased muscle fatigue

The effect of hydrogen-rich water consumption on premenstrual symptoms and quality of life: a randomized controlled trial

Date & Journal: BMC Womens Health. 2024 Mar 26

Abstract

Background: Premenstrual syndrome (PMS) consists of psychiatric or somatic symptoms negatively affecting the daily life. PMS treatment can involve the use of complementary-alternative approaches. Hydrogen-rich water (HRW) has antioxidant and anti-inflammatory properties that may treat PMS. This study aimed to investigate the effect of drinking HRW on the severity of premenstrual symptoms and the quality of life of women who suffer from PMS.
Results: The intervention group had significantly lower mean scores than the control group in both the first and second follow-ups on the PMSS (P<0.05). In the first follow-up, the intervention group had significantly higher mean scores in the Physical Health and Psychological domains of the WHOQOL-BREF compared to the control group (P<0.05). Group × time interaction was significant for PMSS (F = 10.54, P<0.001). Group × time interaction was insignificant for WHOQOL- BREF (P>0.05).
Conclusions: The consumption of HRW reduces the severity of premenstrual symptoms and improves individuals' quality of life in physical and psychological domains.

Aker MN, Gönenç İM, Çalişici D, Bulut M, Alwazeer D, LeBaron TW. The effect of hydrogen-rich water consumption on premenstrual symptoms and quality of life: a randomized controlled trial. BMC Womens Health. 2024 Mar 26;24(1):197. doi: 10.1186/s12905-024-0

Hydrogen-Rich Alkaline Water Supplementation Restores a Healthy State and Redox Balance in H2O2-Treated Mice

Date & Journal: Int J Mol Sci. 2024 Jun 19

Abstract

Water is a major requirement for our bodies, and alkaline water has induced an antioxidant response in a model of natural aging. A series of recent reports have shown that aging is related to reduced water intake. Hydrogen-rich water has been suggested to exert a general antioxidant effect in relation to both improving lifestyle and preventing a series of diseases. Here, we wanted to investigate the effect of the daily intake of hydrogen-rich alkaline water (HAW) in counteracting the redox imbalance induced in a model of H_2O_2-treated mice. Mice were treated with H_2O_2 for two weeks and either left untreated or supplied with HAW. The results show that HAW induced a reduction in the ROS plasmatic levels that was consistent with the increase in the circulating glutathione. At the same time, the reduction in plasmatic 8-hydroxy-2'-deoxyguanosine was associated with reduced DNA damage in the whole body. Further analysis of the spleen and bone marrow cells showed a reduced ROS content consistent with a significantly reduced mitochondrial membrane potential and superoxide accumulation and an increase in spontaneous proliferation. This study provides evidence for a clear preventive and curative effect of HAW in a condition of systemic toxic condition and redox imbalance.

Mizzoni D, Logozzi M, Di Raimo R, Spada M, Fais S. Hydrogen-Rich Alkaline Water Supplementation Restores a Healthy State and Redox Balance in H2O2-Treated Mice. Int J Mol Sci. 2024 Jun 19;25(12):6736. doi: 10.3390/ijms25126736. PMID: 38928440; PMCID: PMC1

Molecular hydrogen: An inert gas turns clinically effective

Ann Med . 2015 Jun

Abstract

Molecular hydrogen (H2) appeared as an experimental agent in biomedicine approximately 40 years ago, yet the past 5 years seem to confirm its medicinal value in the clinical environment. H2 improves clinical end-points and surrogate markers in several clinical trials, from metabolic diseases to chronic systemic inflammatory disorders to cancer. However, less information is available concerning its medicinal properties, such as dosage and administration, or adverse reactions and use in specific populations. The present paper overviews the clinical relevance of molecular hydrogen and summarizes data from clinical trials on this innovative medical agent. Clinical profiles of H2 provide evidence-based direction for practical application and future research on molecular hydrogen for the wider health care community.

Ostojic SM. Molecular hydrogen: An inert gas turns clinically effective. Ann Med. 2015 Jun;47(4):301-4. doi: 10.3109/07853890.2015.1034765. Epub 2015 May 4. PMID: 25936365.

Pilot study: Effects of drinking hydrogen-rich water on muscle fatigue caused by acute exercise in elite athletes

Med Gas Res . 2012 Jul 12

Background: Muscle contraction during short intervals of intense exercise causes oxidative stress, which can play a role in the development of overtraining symptoms, including increased fatigue, resulting in muscle microinjury or inflammation. Recently it has been said that hydrogen can function as antioxidant, so we investigated the effect of hydrogen-rich water (HW) on oxidative stress and muscle fatigue in response to acute exercise.

Methods: Ten male soccer players aged 20.9 ± 1.3 years old were subjected to exercise tests and blood sampling. Each subject was examined twice in a crossover double-blind manner; they were given either HW or placebo water (PW) for one week intervals. Subjects were requested to use a cycle ergometer at a 75 % maximal oxygen uptake (VO2) for 30 min, followed by measurement of peak torque and muscle activity throughout 100 repetitions of maximal isokinetic knee extension. Oxidative stress markers and creatine kinase in the peripheral blood were sequentially measured.

Results: Although acute exercise resulted in an increase in blood lactate levels in the subjects given PW, oral intake of HW prevented an elevation of blood lactate during heavy exercise. Peak torque of PW significantly decreased during maximal isokinetic knee extension, suggesting muscle fatigue, but peak torque of HW didn't decrease at early phase. There was no significant change in blood oxidative injury markers (d-ROMs and BAP) or creatine kinase after exercise.

Conclusion: Adequate hydration with hydrogen-rich water pre-exercise reduced blood lactate levels and improved exercise-induced decline of muscle function. Although further studies to elucidate the exact mechanisms and the benefits are needed to be confirmed in larger series of studies, these preliminary results may suggest that HW may be suitable hydration for athletes.

Aoki K, Nakao A, Adachi T, Matsui Y, Miyakawa S. Pilot study: Effects of drinking hydrogen-rich water on muscle fatigue caused by acute exercise in elite athletes. Med Gas Res. 2012 Jul 12;2:12. doi: 10.1186/2045-9912-2-12. PMID: 22520831; PMCID: PMC33955

Hydrogen-Rich Water Improves Cognitive Ability and Induces Antioxidative, Antiapoptotic, and Anti-Inflammatory Effects in an Acute Ischemia-Reperfusion Injury Mouse Model

Biomed Res Int . 2021 Oct 27

Background: Cerebral ischemia and its reperfusion injury facilitate serious neurodegenerative diseases such as dementia due to cell death; however, there is currently no treatment for it. Reactive oxygen species is one of the many factors that induce and worsen the development of such diseases, and it can be targeted by hydrogen treatment. This study examined the effect of molecular hydrogen in cerebral ischemia-reperfusion injury, which is emerging as a novel therapeutic agent for various diseases.

Methods: Ischemia-reperfusion injury was generated through bilateral common carotid artery occlusion in C57BL/6 mice. The test group received hydrogen-rich water orally during the test period. To confirm model establishment and the effect of hydrogen treatment, behavioural tests, biochemical assays, immunofluorescence microscopy, and cytokine assays were conducted.

Results: Open field and novel object recognition tests revealed that the hydrogen-treated group had improved cognitive function and anxiety levels compared to the nontreated group, while hematoxylin and eosin stain showed abundant pyknotic cells in a model mouse brain, and this was attenuated in the hydrogen-treated mouse brain. Total antioxidant capacity and thiobarbituric acid reactive substance assays revealed that hydrogen treatment induced antioxidative effects in the mouse brain. Immunofluorescence microscopy revealed attenuated apoptosis in the striatum, cerebral cortex, and hippocampus of hydrogen-treated mice. Western blotting showed that hydrogen treatment reduced Bax and TNF*α* levels. Finally, cytokine assays showed that IL-2 and IL-10 levels significantly differed between the hydrogen-treated and nontreated groups.

Conclusion: Hydrogen treatment could potentially be a future therapeutic strategy for ischemia and its derived neurodegenerative diseases by improving cognitive abilities and inducing antioxidative and antiapoptotic effects. Hydrogen treatment also decreased Bax and TNF*α* levels and induced an anti-inflammatory response via regulation of IL-2 and IL-10. These results will serve as a milestone for future studies intended to reveal the mechanism of action of molecular hydrogen in neurodegenerative diseases.

Lee D, Choi JI. Hydrogen-Rich Water Improves Cognitive Ability and Induces Antioxidative, Antiapoptotic, and Anti-Inflammatory Effects in an Acute Ischemia-Reperfusion Injury Mouse Model. Biomed Res Int. 2021 Oct 27;2021:9956938. doi: 10.1155/2021/9956938

Molecular hydrogen is protective against 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson's disease

Neurosci Lett . 2009 Apr 3

Abstract

Molecular hydrogen serves as an antioxidant that reduces hydroxyl radicals, but not the other reactive oxygen and nitrogen species. In the past year, molecular hydrogen has been reported to prevent or ameliorate eight diseases in rodents and one in human associated with oxidative stress. In Parkinson's disease, mitochondrial dysfunction and the associated oxidative stress are major causes of dopaminergic cell loss in the substantia nigra. We examined effects of approximately 50%-saturated molecular hydrogen in drinking water before or after the stereotactic surgery on 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson's disease. Methamphetamine-induced behavioral analysis showed that molecular hydrogen prevented both the development and progression of the nigrostriatal degeneration. Tyrosine hydroxylase staining of the substantia nigra and striatum also demonstrated that pre- and post-treatment with hydrogen prevented the dopaminergic cell loss. Our studies suggest that hydrogen water is likely able to retard the development and progression of Parkinson's disease.

Fu Y, Ito M, Fujita Y, Ito M, Ichihara M, Masuda A, Suzuki Y, Maesawa S, Kajita Y, Hirayama M, Ohsawa I, Ohta S, Ohno K. Molecular hydrogen is protective against 6-hydroxydopamine-induced nigrostriatal degeneration in a rat model of Parkinson's disease. N

WATER & CONSTIPATION

Up to one half of all Americans have it.

Drinking Chlorinated water = Constipation

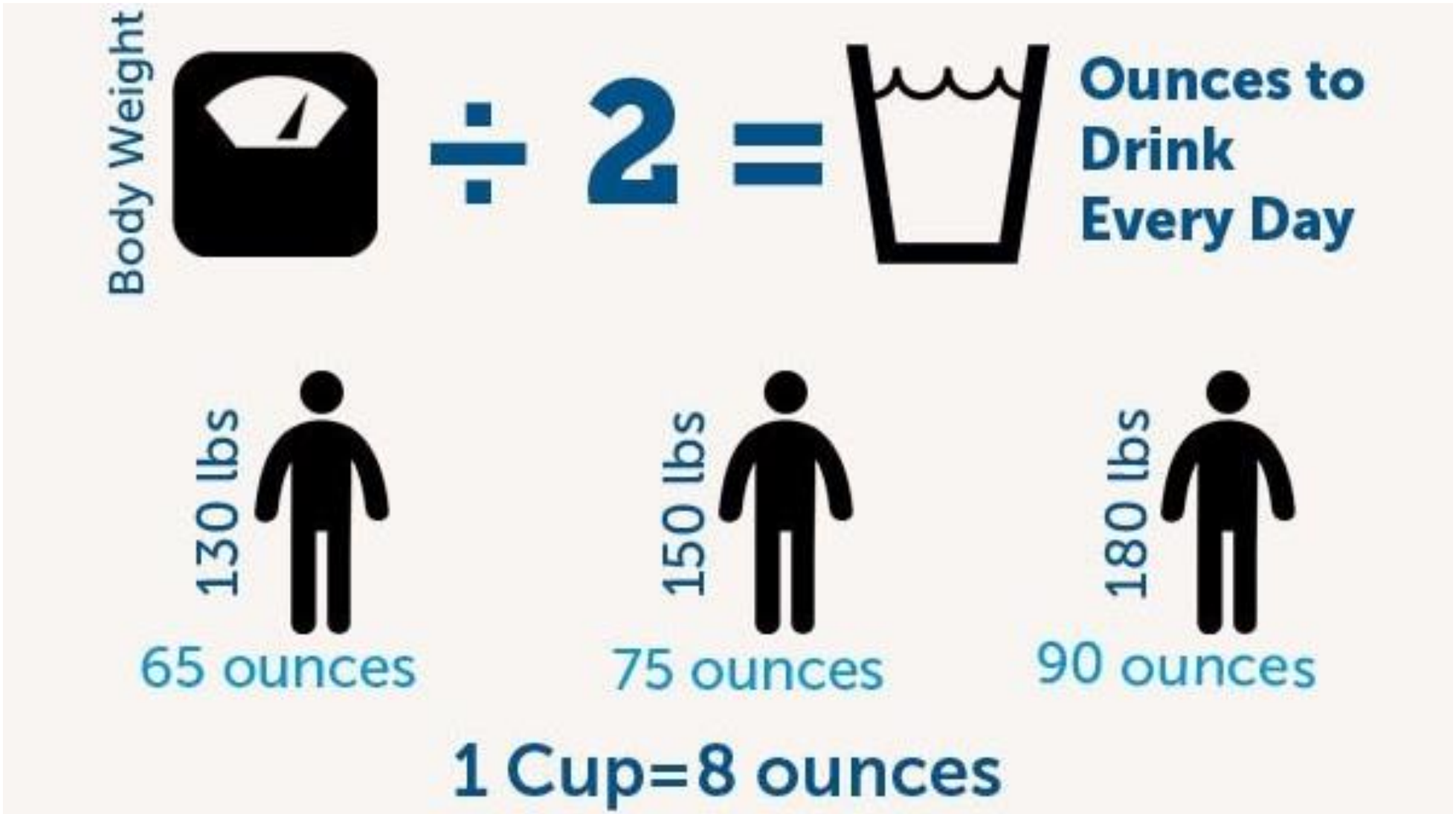
Chlorine compounds in tap water kill the helpful good gut bacteria, leading to overgrowth of harmful bacteria, yeasts, or even parasites.

1. Igram C, Igram C, Igram C. How To Eat Right And Live Longer. Buffalo Grove, IL: Knowledge House Publishers; 2005.

HOW MUCH WATER SHOULD WE DRINK?

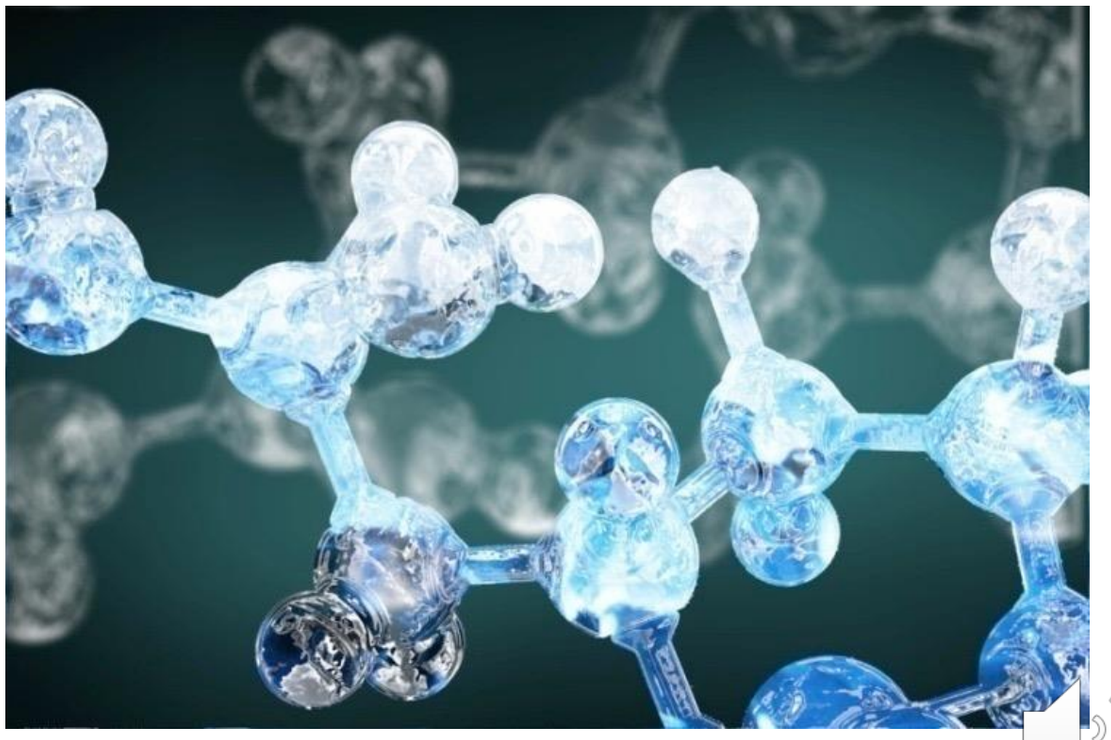
Half your body weight in oz. per day minimum!

Hydration usually takes about **8 weeks** to achieve if drinking the proper amount.



PH & IONIZATION

- **Filtration (Carbon Ceramic Fiber Filter)**
- **Being able to control the pH/acid/alkalinity**
- **Number of plates in the machine (9-13 preferred)**
- **Less molecules per cluster**
- **Self Cleaning**
- **No adding of minerals**
- **Lifetime Warranty**



UNHEALTHY WATER IN YOUR HOME!
DO YOU DRINK ANY OF THESE?

BOTTLED WATER

- There have been more than 100 recalls on contaminated bottled water.
- According to the FDA, "contaminated bottled water can harm your health."

BOTTLED ALKALINE WATER

Did you know that even though some bottled water is marketed as being alkaline, it is impossible for this type of water to contain the antioxidant known as molecular hydrogen? That's because molecular hydrogen cannot be contained in a plastic bottle (the hydrogen is too small and therefore dissipates too quickly).

TAP WATER

The EPA states that tap water sources may contain over 90 dangerous contaminants which can cause cancer and learning disorders in children.

Some of the EPA's list of tap water contaminants include:

- E. Coli
- Lead
- Arsenic
- Organic chemicals
- Pharmaceuticals
- Chromium-6
- Chloroform

Sources:

https://www.epa.gov/sites/default/files/2015-10/documents/ace3_drinking_water.pdf

https://www.cdc.gov/healthywater/drinking/bottled/index.html#

https://www.usnews.com/news/business/articles/2021-05-21/us-enacts-real-water-recall-amid-reports-of-death-illness#

UNHEALTHY WATER CONTINUED...

FILTERED WATER (WATER PITCHERS/ FAUCET ATTACHMENTS)

- Most of these devices lack premium filtration materials, and they do not add any health benefits like antioxidants, alkaline pH levels or molecular hydrogen to your water.
- Look at the packaging of these filter pitchers and you'll notice that they only remove a few contaminants and 2-3 heavy metals (some not including lead) – leaving consumers with a false sense of security.

REVERSE OSMOSIS WATER (R.O.)

- Water is intended to provide essential minerals (like calcium and magnesium) to protect your teeth and bones. By drinking water that is devoid of these minerals (like R.O.) your body will naturally pull these minerals from your teeth and bones, thus weakening them.
- The World Health Organization (WHO) made a statement about R.O. water: "long term RO consumption has a definite adverse influence on the animal and human organisms."

HTTPS://WWW.FDA.GOV/SAFETY/RECALLS-MARKET-WITHDRAWALS-SAFETY-ALERTS/REAL-WATER-INC-ISSUES-PRECAUTIONARY-RECALL-ALL-SIZES-REAL-WATER-BRAND-DRINKING-WATER-DUE-POSSIBLE

DID YOU KNOW?

- Vitamin C and Molecular Hydrogen can BOTH neutralize free radicals. However, studies show that Molecular Hydrogen provides greater protection than Vitamin C because ONLY Molecular Hydrogen can increase powerful antioxidant enzymes in the body.

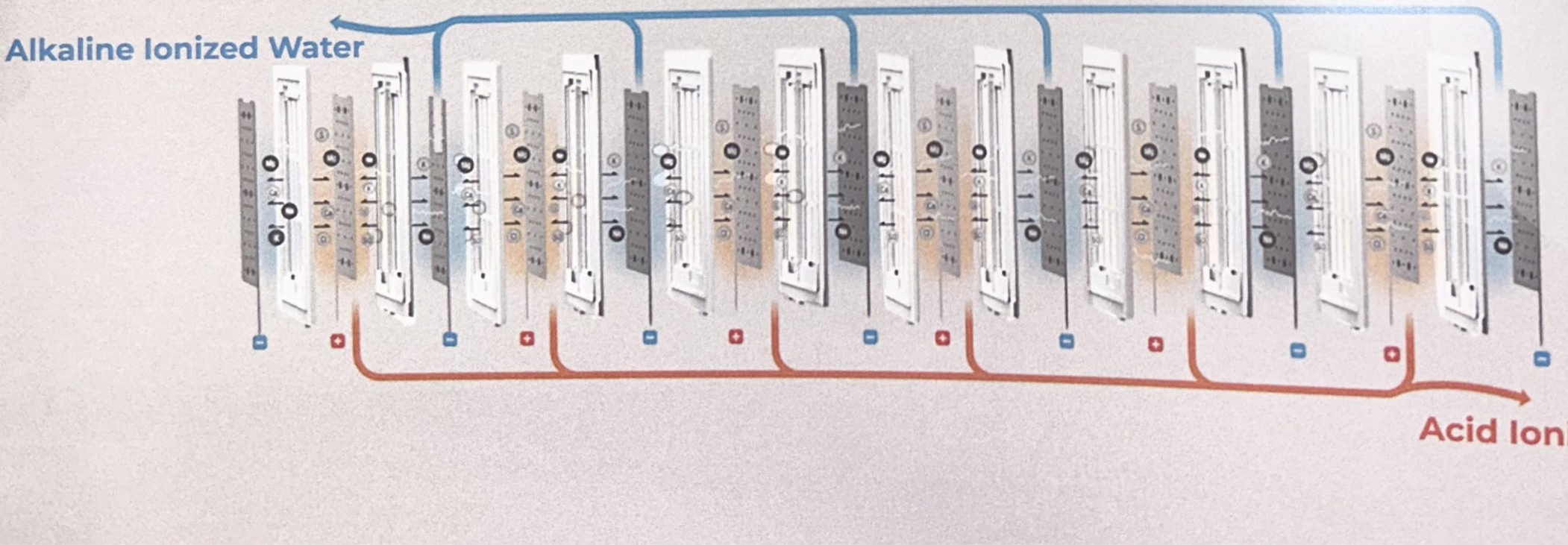
HOW IT WORKS

The secret is the water cell...

When your tap water enters the Tyent water ionizer, it runs through two filters and is filtered to 99% purity.

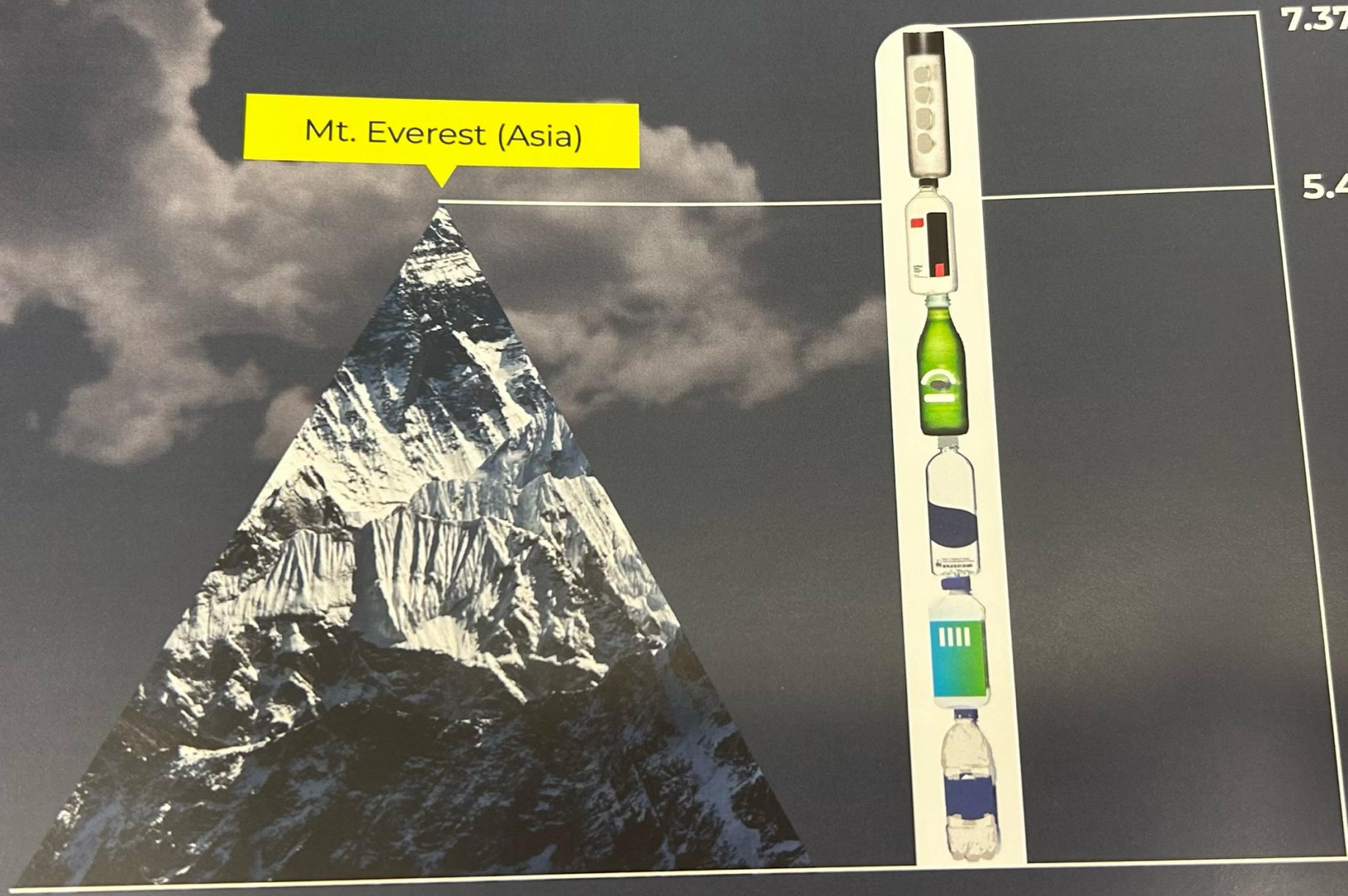
Next, it runs through our proprietary electrolysis process where “free” and available hydrogen gas (H2 molecular hydrogen) is dissolved into the water. Then, the water molecules are split into two unique streams of water. One stream becomes acidic, which is great for your skin and hair. We call it Beauty Water!

The other water stream becomes the perfect drinking water! It’s alkaline, ultra-hydrating and filled with therapeutic antioxidants called molecular hydrogen.



IS YOUR WATER ECO-FRIENDLY?

1 family + 10 years = a tower of bottles as high as Mt. Everest!



HIGHER THAN MT. EVEREST!

BOTTLED WATER VS. TYENT WATER
DOES IT MAKE CENT$?

Bottled Alkaline Water costs between **$2.00 to $5.00 on average!**

Tyent water ONLY costs about **6¢ a glass!**

TM Filtration

Carbon block

Membrane

.01 Micron UF

TM Ceramic

Carbon block

Membrane

DUAL FILTRATION

Removes over 99% of unhealthy contaminants...
To help take care of what matters most!

Tyent engineers designed the most advanced water filtration technology in the world. All Tyent units have two large state-of-the-art filters with Ultra .01 Micron Filtration technology. It's the same filtration found in some dialysis machines.

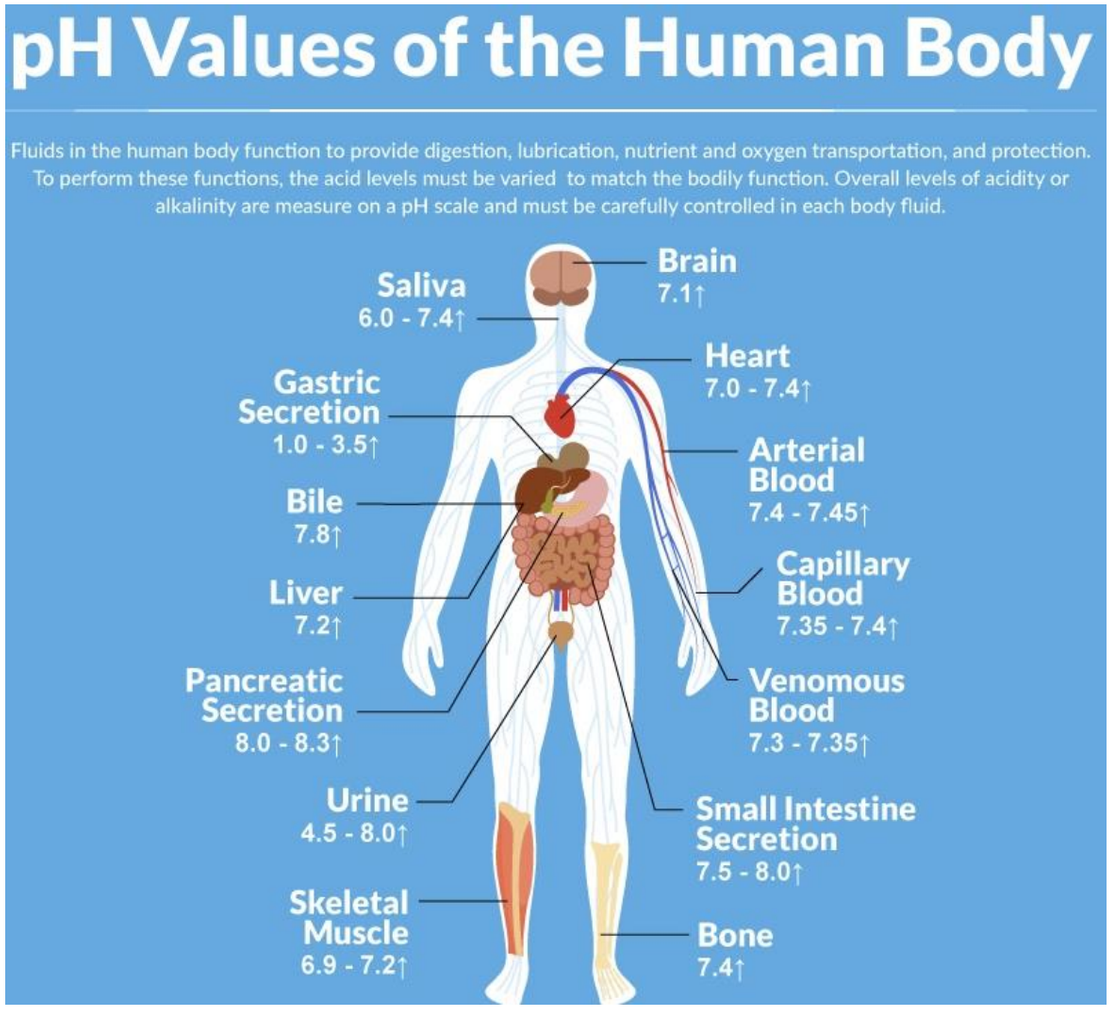
Tyent filters have been tested by an EPA certified lab and have been shown to reduce MORE THAN 200 CONTAMINANTS found in tap water by over 99%!

PH, IONIZATION & MOLECULAR HYDROGEN

With Molecular Hydrogen Boost

- Auto fill Quantity Selector
- 3 Alkaline Levels & 3 Acidic Levels + Turbo Modes
- Outstanding Electrolysis
- Smartphone Touch Technology
- TM Ceramic & Carbon Block filtration

PH: ACIDIC WATER, SKIN & HAIR ARE BETWEEN 4.5 TO 5.5 PH



Benefits of Acidic Water:

- Natural astringent & skin cleanser
- Helps clear up bacteria that causes acne
- Soothes the itch & sting of insect bites, eczema & psoriasis
- Removes tooth plaque
- Improves plant growth

II. BASIC SCIENCE (NUTRITION)

D. IMMUNE SYSTEM RESEARCH
   a) Recent studies from the NIH/PubMed
   b) Nutritional options
   c) Objective nutritional questionnaire
E. WATER
   a) Molecular hydrogen, constipation, ionization
   b) Filtration and nutritional benefits
   c) Water pH & safety
F. EVIDENCE BASED DIET RELATED RESEARCH
   a) Intermittent Fasting
   b) Ketogenic Diet
   c) Plant Based Nutrition

NUTRITION DISCLAIMER

Just Remember…
Nutrition Is One Of The Hardest Topics To Cover As Guidelines Are Always Changing & Diets Are Open To Different Interpretation.

Evidence Based Diet Related Research: Fasting & Intermittent Fasting

Complete Alternate Day Fasting	Involves alternating fasting days (no energy-containing foods or beverages consumed) with eating days.
Time Restricted Feeding	No eating anything but water after dinner. No snacking in the evening. Eating can be resumed the following day any time before noon. Eating is permitted until after dinner.
Religious Fasting	Variety of fasting regimens undertaken for religious or spiritual purposes, ie. Yom Kippur (Judaism) 25.5hr fast - no food or water.
Ramadan Fasting	A fast from sunrise to sunset during the holy month of Ramadan; the most common dietary practice is to consume one large meal after sunset and one lighter meal before dawn. Thus, the feast and fast periods of Ramadan are approximately 12 hours in length
Other Religious Fasts	Members of the Church of Jesus Christ of Latter-Day Saints routinely abstain from food and drink for extended periods of time. Some Seventh-day Adventists consume their last of two daily meals in the afternoon, resulting in an extended nighttime fasting interval that may be biologically important

Source: https://academic.oup.com/nutritionreviews/article/73/10/661/1849182

METABOLIC EFFECTS OF INTERMITTENT FASTING

Published: Annu. Rev. Nutr . 2017 Aug 21

The objective of this review is to provide an overview of intermittent fasting regimens, summarize the evidence on the health benefits of intermittent fasting, and discuss physiological mechanisms by which intermittent fasting might lead to improved health outcomes. A MEDLINE search was performed using PubMed and the terms "intermittent fasting," "fasting," "time-restricted feeding," and "food timing." Modified fasting regimens appear to promote weight loss and may improve metabolic health. Several lines of evidence also support the hypothesis that eating patterns that reduce or eliminate nighttime eating and prolong nightly fasting intervals may result in sustained improvements in human health. Intermittent fasting regimens are hypothesized to influence metabolic regulation via effects on (a) circadian biology, (b) the gut microbiome, and (c) modifiable lifestyle behaviors, such as sleep. If proven to be efficacious, these eating regimens offer promising nonpharmacological approaches to improving health at the population level, with multiple public health benefits.

Patterson RE, Sears DD. Metabolic Effects of Intermittent Fasting. Annu Rev Nutr. 2017;37:371-393. doi:10.1146/annurev-nutr-071816-064634

IMPACT OF INTERMITTENT FASTING ON THE LIPID PROFILE: ASSESSMENT ASSOCIATED WITH DIET AND WEIGHT LOSS

Published: Clinical Nutrition ESPEN. April 2018

Intermittent fasting, whose proposed benefits include the improvement of lipid profile and the body weight loss, has gained considerable scientific and popular repercussion. This review aimed to consolidate studies that analyzed the lipid profile in humans before and after intermittent fasting period through a detailed review; and to propose the physiological mechanism, considering the diet and the body weight loss.

Normocaloric and hypocaloric intermittent fasting may be a dietary method to aid in the improvement of the lipid profile in healthy, obese and dyslipidemic men and women by reducing total cholesterol, LDL, triglycerides and increasing HDL levels. However, the majority of studies that analyze the intermittent fasting impacts on the lipid profile and body weight loss are observational based on Ramadan fasting, which lacks large sample and detailed information about diet. Randomized clinical trials with a larger sample size are needed to evaluate the IF effects mainly in patients with dyslipidemia.

Santos HO, Macedo RCO. Impact of intermittent fasting on the lipid profile: Assessment associated with diet and weight loss. Clin Nutr ESPEN. 2018;24:14-21. doi:10.1016/j.clnesp.2018.01.002

EVIDENCE BASED DIET RELATED RESEARCH: KETOGENIC DIET

A diet moderate in proteins (lean meats, fish) and high fats, low in carbohydrates. i.e. healthy fats avocado, nuts, and olive oil.

In absence of circulating blood sugar from food, we start breaking down stored fat into ketone bodies to generate energy.

Difficult to sustain over a long period of time.

HISTORY OF THE KETOGENIC DIET

Date & Journal: Epilepsia . 2008 Nov

Abstract

Fasting and other dietary regimens have been used to treat epilepsy since at least 500 BC. To mimic the metabolism of fasting, the ketogenic diet (KD) was introduced by modern physicians as a treatment for epilepsy in the 1920s. For two decades this therapy was widely used, but with the modern era of antiepileptic drug treatment its use declined dramatically. By the end of the twentieth century this therapy was available in only a small number of children's hospitals. Over the past 15 years, there has been an explosion in the use, and scientific interest in the KD. This review traces the history of one of the most effective treatments for childhood epilepsy.

Wheless JW. History of the ketogenic diet. Epilepsia. 2008;49 Suppl 8:3-5. doi:10.1111/j.1528-1167.2008.01821.x

INFLUENCE OF THE MEDITERRANEAN AND KETOGENIC DIETS ON COGNITIVE STATUS AND DECLINE: A NARRATIVE REVIEW

Date & Journal: Nutrients . 2020 Apr 8.

Abstract

Alzheimer's disease (AD) is the most common form of senile dementia, accounting for up to 70% of dementia cases. AD is a slowly progressive disease, which causes global mental deterioration by affecting various cognitive areas. A growing body of evidence has demonstrated that lifestyle habits and nutritional patterns could delay the natural course of the neurodegeneration process. There is no single dietary pattern unequivocally proven to prevent AD. Nevertheless, epidemiological data suggest that by adopting several dietary habits, especially if accompanied with a healthy lifestyle, the negative consequences of AD could potentially be delayed. Alongside with others, two specific eating patterns have been well investigated concerning their potential beneficial effect on cognitive status: the Mediterranean diet (MedDi) and the Ketogenic Diet (KD). Despite the different underlying mechanisms, both of them have demonstrated a fairly profitable role in reducing or delaying cognitive impairment. The aim of the present narrative review is to overview the existing research on the efficacy of MedDi and KD against AD-related cognitive decline, focusing on the proposed protective mechanisms of action. Although the current knowledge on this complex topic does not allow us, at this point, to make exhaustive conclusions, this information could be of help in order to better characterize the possible role of MedDi and KD as nonpharmacological therapies in the treatment of AD and, more generically, of neurodegenerative disorders.

Vinciguerra F, Graziano M, Hagnäs M, Frittitta L, Tumminia A. Influence of the Mediterranean and Ketogenic Diets on Cognitive Status and Decline: A Narrative Review. Nutrients. 2020;12(4):1019. Published 2020 Apr 8. doi:10.3390/nu12041019

THE KETOGENIC DIET AND SPORT: A POSSIBLE MARRIAGE?

Date & Journal: Exerc Sport Sci Rev. 2015 Jul

Abstract

The ketogenic diet (KD) is used widely as a weight loss strategy and, more rarely, as therapy for some diseases. In many sports, weight control is often necessary (boxing, weightlifting, wrestling, etc.), but the KD usually is not considered. Our hypothesis is that KD might be used to achieve fat loss without affecting strength/power performance negatively.

Paoli A, Bianco A, Grimaldi KA. The Ketogenic Diet and Sport: A Possible Marriage?. Exerc Sport Sci Rev. 2015;43(3):153-162. doi:10.1249/JES.0000000000000050

KETOGENIC DIET IN ALZHEIMER'S DISEASE

Date & Journal: Int J Mol Sci . 2019 Aug 9.

Abstract

At present, the prevalence of Alzheimer's disease, a devastating neurodegenerative disorder, is increasing. Although the mechanism of the underlying pathology is not fully uncovered, in the last years, there has been significant progress in its understanding. This includes: Progressive deposition of amyloid β-peptides in amyloid plaques and hyperphosphorylated tau protein in intracellular as neurofibrillary tangles; neuronal loss; and impaired glucose metabolism. Due to a lack of effective prevention and treatment strategy, emerging evidence suggests that dietary and metabolic interventions could potentially target these issues. The ketogenic diet is a very high-fat, low-carbohydrate diet, which has a fasting-like effect bringing the body into a state of ketosis. The presence of ketone bodies has a neuroprotective impact on aging brain cells. Moreover, their production may enhance mitochondrial function, reduce the expression of inflammatory and apoptotic mediators. Thus, it has gained interest as a potential therapy for neurodegenerative disorders like Alzheimer's disease. This review aims to examine the role of the ketogenic diet in Alzheimer's disease progression and to outline specific aspects of the nutritional profile providing a rationale for the implementation of dietary interventions as a therapeutic strategy for Alzheimer's disease.

Rusek M, Pluta R, Ułamek-Kozioł M, Czuczwar SJ. Ketogenic Diet in Alzheimer's Disease. Int J Mol Sci. 2019;20(16):3892. Published 2019 Aug 9. doi:10.3390/ijms20163892

KETOGENIC DIET AS A METABOLIC THERAPY FOR MOOD DISORDERS: EVIDENCE AND DEVELOPMENTS

Date & Journal: Neurosci Biobehav Rev . 2018 Nov.

Abstract

Despite significant advances in pharmacological and non-pharmacological treatments, mood disorders remain a significant source of mental capital loss, with high rates of treatment resistance, requiring a coordinated effort in investigation and development of efficient, tolerable and accessible novel interventions. Ketogenic diet (KD) is a low-carb diet that substantially changes the energetic matrix of the body including the brain. It has been established as an effective anticonvulsant treatment, and more recently, the role of KD for mental disorders has been explored. Ketogenic diet has profound effects in multiple targets implicated in the pathophysiology of mood disorders, including but not limited to, glutamate/GABA transmission, monoamine levels, mitochondrial function and biogenesis, neurotrophism, oxidative stress, insulin dysfunction and inflammation. Preclinical studies, case reports and case series have demonstrated antidepressant and mood stabilizing effects of KD, however, to date, no clinical trials for depression or bipolar disorder have been conducted. Because of its potential pleiotropic benefits, KD should be considered as a promising intervention in research in mood disorder therapeutics, especially in treatment resistant presentations.

Brietzke E, Mansur RB, Subramaniapillai M, et al. Ketogenic diet as a metabolic therapy for mood disorders: Evidence and developments. Neurosci Biobehav Rev. 2018;94:11-16. doi:10.1016/j.neubiorev.2018.07.020

EVIDENCE BASED DIET RELATED RESEARCH: PLANT BASED NUTRITION

- Focuses on vegetables, fruits, grains (especially whole grains), beans and peas, lentils, nuts, and seeds (rather than on meat, poultry, fish, eggs, and dairy foods). It is not necessarily meatless or vegan. (Plant based burgers.)

- Min. 70% of every plate ate is plant based.

A PLANT-BASED DIET, ATHEROGENESIS, AND CORONARY ARTERY DISEASE PREVENTION

Date & Journal: Perm J . Winter 2015.

Abstract

A plant-based diet is increasingly becoming recognized as a healthier alternative to a diet laden with meat. Atherosclerosis associated with high dietary intake of meat, fat, and carbohydrates remains the leading cause of mortality in the US. This condition results from progressive damage to the endothelial cells lining the vascular system, including the heart, leading to endothelial dysfunction. In addition to genetic factors associated with endothelial dysfunction, many dietary and other lifestyle factors, such as tobacco use, high meat and fat intake, and oxidative stress, are implicated in atherogenesis. Polyphenols derived from dietary plant intake have protective effects on vascular endothelial cells, possibly as antioxidants that prevent the oxidation of low-density lipoprotein. Recently, metabolites of L-carnitine, such as trimethylamine-N-oxide, that result from ingestion of red meat have been identified as a potential predictive marker of coronary artery disease (CAD).

Tuso P, Stoll SR, Li WW. A plant-based diet, atherogenesis, and coronary artery disease prevention. Perm J. 2015;19(1):62-67. doi:10.7812/TPP/14-036

PLANT-BASED DIETS: CONSIDERATIONS FOR ENVIRONMENTAL IMPACT, PROTEIN QUALITY, AND EXERCISE PERFORMANCE

Date & Journal: Nutrients . 2018 Dec 1.

Abstract

Plant-based diets provide well-established physical and environmental health benefits. These benefits stem in part from the degree of restriction of animal-derived foods. Historically, meat and other animal-derived proteins have been viewed as an integral component of athletes' diets, leading some to question the adequacy of vegetarian or vegan diets for supporting athletic performance. The purpose of this review is to examine the impact of plant-based diets on human physical health, environmental sustainability, and exercise performance capacity. Based on currently available literature, it is unlikely that plant-based diets provide advantages, but do not suffer from disadvantages, compared to omnivorous diets for strength, anaerobic, or aerobic exercise performance. However, plant-based diets typically reduce the risk of developing numerous chronic diseases over the lifespan and require fewer natural resources for production compared to meat-containing diets. As such, plant-based diets appear to be viable options for adequately supporting athletic performance while concurrently contributing to overall physical and environmental health. Given the sparse literature comparing omnivore, vegetarian, and vegan athletes, particularly at the elite level, further research is warranted to ascertain differences that might appear at the highest levels of training and athletic performance.

Lynch H, Johnston C, Wharton C. Plant-Based Diets: Considerations for Environmental Impact, Protein Quality, and Exercise Performance. Nutrients. 2018;10(12):1841. Published 2018 Dec 1. doi:10.3390/nu10121841

CARDIO-METABOLIC BENEFITS OF PLANT-BASED DIETS

Date & Journal: Nutrients . 2017 Aug 9.

Abstract

Cardio-metabolic disease, namely ischemic heart disease, stroke, obesity, and type 2 diabetes, represent substantial health and economic burdens. Almost one half of cardio-metabolic deaths in the U.S. might be prevented through proper nutrition. Plant-based (vegetarian and vegan) diets are an effective strategy for improving nutrient intake. At the same time, they are associated with decreased all-cause mortality and decreased risk of obesity, type 2 diabetes, and coronary heart disease. Evidence suggests that plant-based diets may reduce the risk of coronary heart disease events by an estimated 40% and the risk of cerebral vascular disease events by 29%. These diets also reduce the risk of developing metabolic syndrome and type 2 diabetes by about one half. Properly planned vegetarian diets are healthful, effective for weight and glycemic control, and provide metabolic and cardiovascular benefits, including reversing atherosclerosis and decreasing blood lipids and blood pressure. The use of plant-based diets as a means of prevention and treatment of cardio-metabolic disease should be promoted through dietary guidelines and recommendations.

Kahleova H, Levin S, Barnard N. Cardio-Metabolic Benefits of Plant-Based Diets. Nutrients. 2017;9(8):848. Published 2017 Aug 9. doi:10.3390/nu9080848

ASSOCIATION BETWEEN RED MEAT CONSUMPTION AND COLON CANCER: A SYSTEMATIC REVIEW OF EXPERIMENTAL RESULTS

Date & Journal: Exp Biol Med (Maywood) . 2017 Apr.

Abstract

A role for red and processed meat in the development of colorectal cancer has been proposed based largely on evidence from observational studies in humans, especially in those populations consuming a westernized diet. Determination of causation specifically by red or processed meat is contingent upon identification of plausible mechanisms that lead to colorectal cancer. We conducted a systematic review of the available evidence to determine the availability of plausible mechanistic data linking red and processed meat consumption to colorectal cancer risk. Forty studies using animal models or cell cultures met specified inclusion criteria, most of which were designed to examine the role of heme iron or heterocyclic amines in relation to colon carcinogenesis. Most studies used levels of meat or meat components well in excess of those found in human diets. Although many of the experiments used semi-purified diets designed to mimic the nutrient loads in current westernized diets, most did not include potential biologically active protective compounds present in whole foods. Because of these limitations in the existing literature, there is currently insufficient evidence to confirm a mechanistic link between the intake of red meat as part of a healthy dietary pattern and colorectal cancer risk. Impact statement Current recommendations to reduce colon cancer include the reduction or elimination of red or processed meats. These recommendations are based on data from epidemiological studies conducted among cultures where meat consumption is elevated and consumption of fruits, vegetables, and whole grains are reduced. This review evaluated experimental data exploring the putative mechanisms whereby red or processed meats may contribute to colon cancer. Most studies used levels of meat or meat-derived compounds that were in excess of those in human diets, even in cultures where meat intake is elevated. Experiments where protective dietary compounds were used to mitigate the extreme levels of meat and meat-derived compounds showed protection against colon cancer, with some essentially negating the impact of meat in the diet. It is essential that better-designed studies be conducted that use relevant concentrations of meat or meat-derived compounds in complex diets representative of the foods consumed by humans.

Turner ND, Lloyd SK. Association between red meat consumption and colon cancer: A systematic review of experimental results. Exp Biol Med (Maywood). 2017;242(8):813-839. doi:10.1177/1535370217693117

RED AND PROCESSED MEATS AND HEALTH RISKS: HOW STRONG IS THE EVIDENCE?

Date & Journal: Diabetes Care . 2020 Feb.

Abstract

Prevailing dietary guidelines have widely recommended diets relatively low in red and processed meats and high in minimally processed plant foods for the prevention of chronic diseases. However, an ad hoc research group called the Nutritional Recommendations (NutriRECS) consortium recently issued "new dietary guidelines" encouraging individuals to continue their current meat consumption habits due to "low certainty" of the evidence, difficulty of altering meat eaters' habits and preferences, and the lack of need to consider environmental impacts of red meat consumption. These recommendations are not justified, in large part because of the flawed methodologies used to review and grade nutritional evidence. The evidence evaluation was largely based on the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) criteria, which are primarily designed to grade the strength of evidence for clinical interventions especially pharmacotherapy. However, the infeasibility for conducting large, long-term randomized clinical trials on most dietary, lifestyle, and environmental exposures makes the criteria inappropriate in these areas. A separate research group proposed a modified and validated system for rating the meta-evidence on nutritional studies (NutriGRADE) to address several limitations of the GRADE criteria. Applying NutriGRADE, the evidence on the positive association between red and processed meats and type 2 diabetes was rated to be of "high quality," while the evidence on the association between red and processed meats and mortality was rated to be of "moderate quality." Another important limitation is that inadequate attention was paid to what might be replacing red meat, be it plant-based proteins, refined carbohydrates, or other foods. In summary, the red/processed meat recommendations by NutriRECS suffer from important methodological limitations and involve misinterpretations of nutritional evidence. To improve human and planetary health, dietary guidelines should continue to emphasize dietary patterns low in red and processed meats and high in minimally processed plant foods such as fruits and vegetables, whole grains, nuts, and legumes.

Qian F, Riddle MC, Wylie-Rosett J, Hu FB. Red and Processed Meats and Health Risks: How Strong Is the Evidence?. Diabetes Care. 2020;43(2):265-271. doi:10.2337/dci19-0063

III. ADVANCED CHIROPRACTIC ADJUSTIVE TECHNIQUE

A. OVERVIEW OF CLINICAL POSTURE NEUROLOGY

1. Posture Analysis / Evaluation of A to P and Lateral Postures
    a. Functional Movement Techniques using kinesiology tape for posture correction.
2. Posture Correction/ Instrument Proprioceptive Posture Balancing
3. Posture & Systemic Health- A review of the medical literature
4. Forward head posture research in children
5. A current review of neurology literature including: posture, proprioception & posture, and conditions commonly treated by chiropractic methods.

Journal of Manipulative and Physiological Therapeutics
Volume 23 • Number 9 • November/December 2000
0161-4754/2000/$12.00 + 0 76/1/109991 © 2000 JMPT

COMMENTARY

JMPT

A Normal Spinal Position: It's Time to Accept the Evidence

INTRODUCTION

Recent trends in our chiropractic profession seem to be leading away from wellness care into an exclusive focus on short-term care for relief of symptoms, especially pain.[1] In contrast, some recent articles authored by CBP Nonprofit, Inc, researchers express an interest in spinal reconstruction, structural outcomes, and care beyond the mere relief of symptoms.[2-6] In a recent commentary, Haas et al[7] have taken exception to this approach.

A commentary by Haas et al[7] concerning one of our recent papers[8] expressed a paradigm for chiropractic science and patient treatment that is different from that expressed in our recent literature reviews and original publications. Their views on normal spinal position, radiograph usage, radiograph reliability, and spinal rehabilitation of normal structure, as expressed in their commentary, did not include mechanical engineering principles, which we believe necessary for understanding the stresses and strains in abnormal or asymmetric loading of spinal tissues.

In 1998, we had discussed a number critical flaws in 8 commonly held beliefs espoused by some diplomate chiropractic radiologists.[9] Thus, given the fact that the "conventional wisdom" of chiropractic radiologists was challenged, it was not surprising that there were a total of 8 authors and consultants who contributed to the rebuttal commentary of Haas et al.[7] What was not expected was the divergence into a critical analysis of Chiropractic Biophysics (CBP) methods and the Harrison spinal model,[9] which is used as an anatomical outcome for patients receiving CBP-based treatment. However, we are pleased to both address those raised concerns and present our rebuttal to Haas et al's misconceptions about the use of radiography in chiropractic clinical practice.

Because this normal spinal model was only self-published until 1992,[10-12] some have denied the existence of the Harrison normal spinal model and its implications for physiology. These implications were discussed in a short review of Wolff's law (bone remodels to stress) and Davis' law (soft tissue remodels to stress) for abnormal sagittal spinal configurations.[5] Because this Harrison model has recently been published in the indexed literature,[13-16] its existence can no longer be denied or ignored.

Inasmuch as Haas et al[7] had many different topics in their commentary and did provide section titles, it is convenient to respond with reference to those section titles. It is noted that some of their section titles are obscure and certainly not mainstream (eg, their reference to Sackett); nonetheless, the titles are useful as objects for debate. First, however, we present a logical approach to movements in upright posture, from which much about a normal upright position can immediately be derived.

It is a basic theorem of physics and engineering that the movement of any object can be decomposed into rotation, translation, and deformation.[20] Whereas White and Panjabi[21] have used this theorem to describe the 6 degrees of freedom (DOF) of individual spinal segments (rigid bodies), we have used this theorem to express all possible movements of the human head, thoracic cage, and pelvis in 3 dimensions.[10-12] Figs 1 and 2 are reprinted from a previous article in the *Journal of Manipulative and Physiological Therapeutics*.[22] These movements will form the basis on which we illuminate a normal postural position.

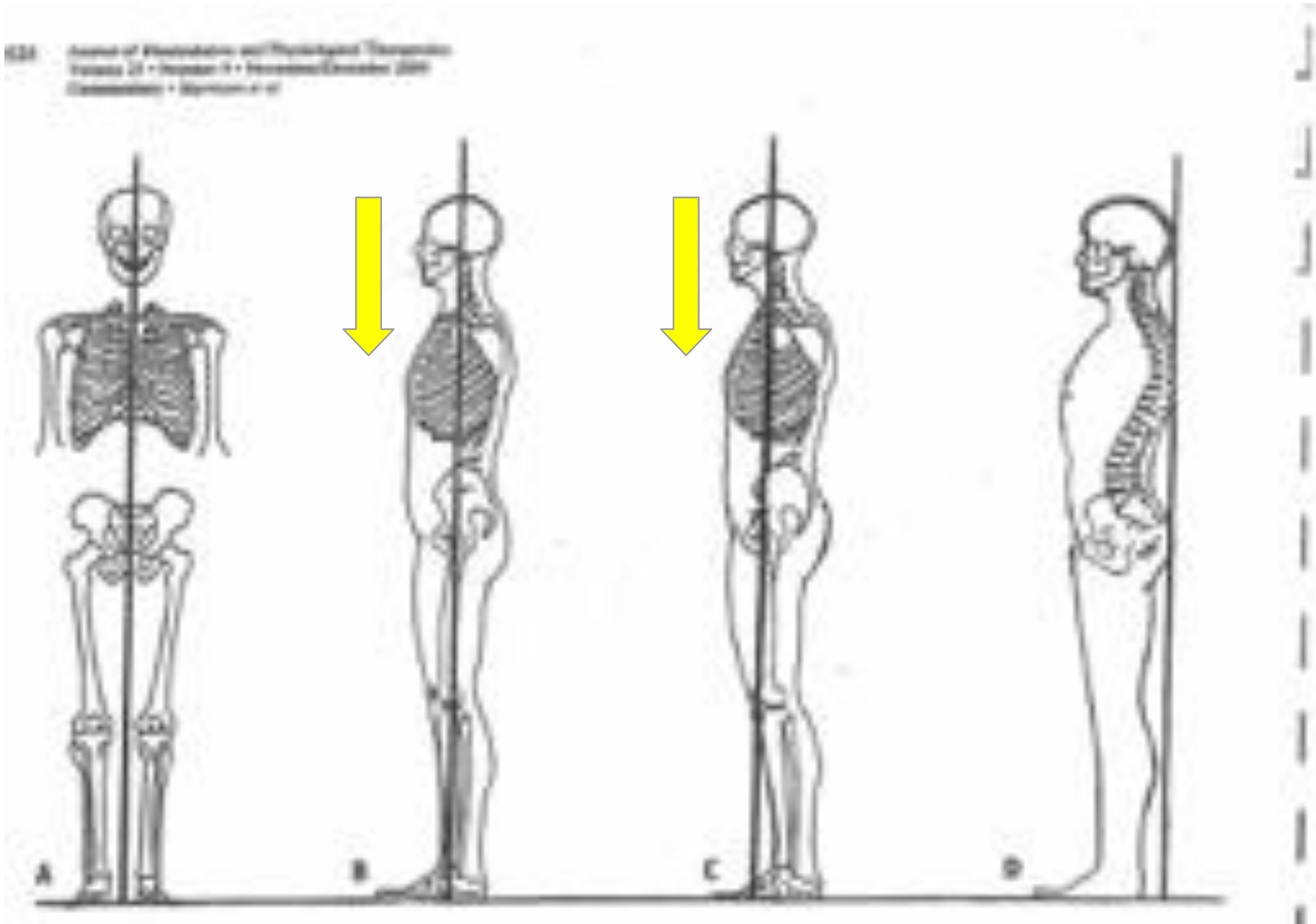
After providing a review of normal upright position in terms of the engineering principles and literature reviews to be presented below, analysis of chiropractic manipulations (which are mostly torsional loads) will lead the reader to conclude that diversified manipulation is inadequate for obtaining a structural change in the neutral resting posture. Thus, precise postural setups (such as those used in the CBP® technique) are recommended for the sake of obtaining structural correction in a patient's spine after the relief of symptoms.

Biologic Plausibility and Validity

Haas et al[7] defined "biologic plausibility" for us. They appear to have assumed that the only important "biologic process" is back pain, and on the basis of that view they assume that it is unnecessary to address the upright spinal configuration under gravity. In addition, they state that our model is "merely a mathematical description of optimal stress on a static system".[7] We now reply that back pain is a multifactorial condition. The process of spinal degeneration and abnormal biomechanics causing mechanical distortions of the central nervous system (CNS) is better characterized as a degenerative disease process. Thus, symptoms appear after the disease process is well advanced (as is the

Picture B: Representative of Normal Spinal Model & Good/Perfect plumb line with equal weight distribution along the entire spinal column & joints of the spine.

Picture C: Shows an anterior forward head posture (slightly) and how the plumb line falls anterior to the spinal column & all other joints.



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FUNCTIONAL MOVEMENT TECHNIQUES USING KINESIOLOGY TAPE FOR POSTURE CORRECTION

PHYSIOLOGICAL EFFECTS OF TAPING ON THE HUMAN BODY

Purpose of Taping:

1. Pain Mitigation
2. Decompression
3. Neurosensory Input

Two effects of taping:

1. Tape mechanically decompresses the skin and underlying tissues
2. Stimulates sensory nerves in the skin.

FUNCTIONAL MOVEMENT TECHNIQUES: KINESIOLOGY TAPING

- As tape is placed on the skin, it causes an alteration of the afferent signals going from the taped area to the brain.
- The brain's response to the incoming information is to alter the efferent signals returning to the taped area.
- Taping alters proprioception, muscle contraction timing and forced output, as well as range of motion.

KINESIOLOGY TAPING CAUTIONS & CONTRAINDICATIONS

Cautions:

- Cautions:
  - Infants
  - Elderly
  - Pregnant patients *(especially in last trimester)*

- **Remember:**
  - Don’t crank tape.
  - Tape can cause skin irritations, contact dermatitis, or blisters.

Contraindications:

- Open wounds, skin infection, active cancer, deep vein thrombosis, kidney disease, and congestive heart failure.

KINESIOLOGY TAPING CARE

Use soap and water, or mix rubbing alcohol with water to cleanse the area to be taped.

Patient’s skin must be clean and dry.

Do NOT tape over hairy patients.

Round all edges of tape with scissors to prevent peeling. Rub tape to activate adhesive.

Tape is water resistant and can last up to 5 days (NO LONGER).

If tape gets wet, DO NOT use hair dryers. Simply pat dry with a towel.

To take off **DO NOT** rip off.
Tape can be removed gently with:

- Baby oil
- Lathered soap
- Hot water in shower

FUNCTIONAL MOVEMENT TECHNIQUES USING KINESIOLOGY TAPE FOR POSTURE CORRECTION

Pain taping requires 1-3 pieces of tape:

2 Stabilizing Pieces - Run along the length of the area being taped.

Applied with NO stretch

Apply with anchors on both top and bottom

1 Decompression Piece - Applied perpendicular (90°) to the stabilization strip.

Applied with 0-50% of stretch in the middle.

Applied over area of greatest pain.

No anchors should be torn in the middle of the tape.

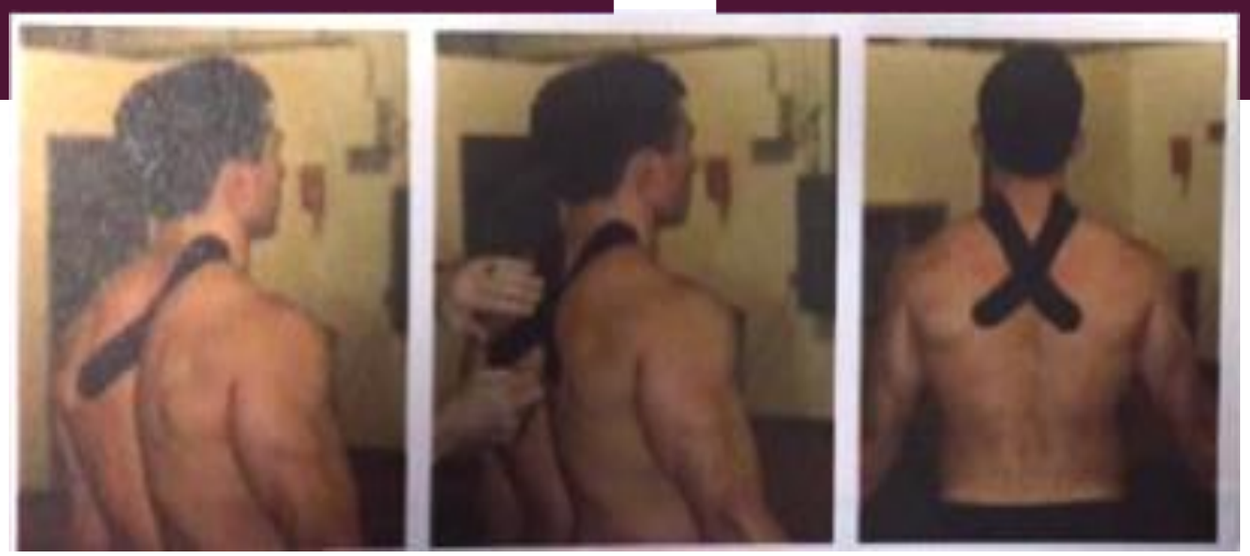
Make sure *all tape endings are on skin, NOT tape.*

FUNCTIONAL MOVEMENT TECHNIQUES USING KINESIOLOGY TAPE FOR POSTURE CORRECTION

Basic postural faults that are noticed in this region are forward head posture, slumped and rounded shoulders, internal rotation, and/or un-leveling of the shoulders.

1. Position patient in the opposite (neutral), but NOT exaggerated, of their unwanted posture.

2. Simply position the patient where you want them and apply the tape.



PROPRIOCEPTIVE NEUROMUSCULAR FACILITATION KINESIO TAPING IMPROVES RANGE OF MOTION OF ANKLE DORSIFLEXION AND BALANCE ABILITY IN CHRONIC STROKE PATIENTS

Date & Journal: Healthcare (Basel) . 2021 Oct 22.

Abstract

This study aimed to determine the effect of a proprioceptive neuromuscular facilitation (PNF) pattern Kinesio taping (KT) application on the ankle dorsiflexion range of motion (DF-ROM) and balance ability in patients with chronic stroke. This crossover study included 18 patients with stroke. The subjects were randomly assigned to three interventions: barefoot, ankle KT (A-KT), and PNF-KT. The A-KT was applied to the gastrocnemius and tibialis anterior (TA) muscles, and subtalar eversion. The PNF-KT was applied on the extensor hallucis, extensor digitorum, and TA muscles. DR-ROM was measured using the iSen™, a wearable sensor. Balance ability was assessed based on static balance, measured by the Biodex Balance System (BBS), and dynamic balance, measured by the timed up and go (TUG) test and dynamic gait index (DGI). Compared with the barefoot and A-KT interventions, PNF-KT showed significant improvements in the ankle DF-ROM and BBS scores, TUG, and DGI. PNF-KT, for functional muscle synergy, improved the ankle DF-ROM and balance ability in patients with chronic stroke. Therefore, the application of PNF-KT may be a feasible therapeutic method for improving ankle movement and balance in patients with chronic stroke. Additional research is recommended to identify the long-term effects of the PNF-KT.

Park D, Bae Y. Proprioceptive Neuromuscular Facilitation Kinesio Taping Improves Range of Motion of Ankle Dorsiflexion and Ba lance Ability in Chronic Stroke Patients. Healthcare (Basel). 2021 Oct 22;9(11):1426. doi: 10.3390/healthcare9111426. PMID: 348284

EFFECTS OF RIGID AND KINESIO TAPING ON SHOULDER ROTATION MOTIONS, POSTERIOR SHOULDER TIGHTNESS, AND POSTURE IN OVERHEAD ATHLETES: A RANDOMIZED CONTROLLED TRIAL

DATE & JOURNAL: J SPORT REHABIL . 2019 MAR 1.

Abstract

Context: Alterations in posture and motion patterns are thought to play a role in developing shoulder injuries in overhead athletes. Taping is widely used in the sporting population, but there are limited empirical data regarding its effectiveness.

Objectives: To determine and compare the effects of rigid and kinesio taping on shoulder rotation motions, posterior shoulder tightness (PST), and posture in overhead athletes.

Conclusions: Kinesio taping may improve and rigid taping may worsen glenohumeral internal rotation and PST in overhead athletes. For increasing total rotation range of motion, kinesio taping is superior to rigid taping. Taping did not affect posture. Short-term kinesio taping in overhead athletes may be useful to improve glenohumeral internal rotation, total rotation range of motion, and PST.

Gulpinar D, Tekeli Ozer S, Yesilyaprak SS. Effects of Rigid and Kinesio Taping on Shoulder Rotation Motions, Posterior Shoulder Tightness, and Posture in Overhead Athletes: A Randomized Controlled Trial. J Sport Rehabil. 2019 Mar 1;28(3):256-265. doi: 10.1123/jsr.2017-0047. Epub 2018 Jul 14. PMID: 28714759.

EFFECTS OF KINESIO TAPING AND EXERCISE ON FORWARD HEAD POSTURE.

Date & Journal: J Sport Rehabil . 2019 Mar 1.

BACKGROUND: Little is known about the effects of Kinesio taping and therapeutic exercise on correcting forward head posture.

OBJECTIVE: To compare Kinesio taping versus therapeutic exercise for forward head posture on static posture, dynamic mobility and functional outcomes.

RESULTS: Both taping and exercise groups showed significant improvements in HFD compared with the control group at post-treatment and follow-up. Compared with the control group, the exercise group exhibited significant improvements in the LCA and the side bending AROM at post-treatment.

CONCLUSIONS: Both Kinesio taping and therapeutic exercise improve forward head posture after intervention and a 2-week follow-up. The effectiveness of therapeutic exercise is better than taping.

Shih HS, Chen SS, Cheng SC, Chang HW, Wu PR, Yang JS, Lee YS, Tsou JY. Effects of Kinesio taping and exercise on forward head posture. J Back Musculoskelet Rehabil. 2017;30(4):725-733. doi: 10.3233/BMR-150346. PMID: 28282[illegible]

POSTURAL ANALYSIS EVALUATION OF A-P AND LATERAL POSTURES

Patient standing in front of a mirror with eyes closed.

- *Head in extension then flexion, then back to where they think its center. Hold for 5 seconds.*

-- Head/ Neck Lateral Translation or Deviation
Main listing usually has symptoms associated with this listing.

-- Head Tilt Right/Left (most common listing you will see)

-- Head Rotation: Right/left (may have symptoms)

-- High Shoulder right/left (lowest on priority list)

POSTURAL ANALYSIS EVALUATION OF A-P AND LATERAL POSTURES (CONTINUED)

Analyze Lower Torso Posture

- Lateral Hip Translation

  (The deviation is toward the high hip side. Pants pocket may appear higher)

- Forward Hip Rotation

  (Pocket is rotating forward)

Lateral Posture

- Forward Head Posture of the shoulders and body
- Rounded forward shoulders
- Dowager hump- T1/ T2 area
- Hyperlordosis = increased lumbar curve

POSTURE CORRECTION / INSTRUMENT PROPRIOCEPTIVE POSTURAL BALANCING

1. Mirror image setup, (opposite posture that the patient presented.)

2. Super stress posture into the opposite pattern (stress posture into passive range of motion.)

3. Stimulate areas of large proprioceptive beds with a high speed, low force instrument or hand.(Lower forces are preferred.)

Ex.) In the upper torso regions, stimulate lightly on skin, anywhere in upper cervical area.

Ex.) For lower torso regions, stimulate iliac crest or SI Joints

POSTURE CORRECTION / INSTRUMENT PROPRIOCEPTIVE POSTURAL BALANCING
(CONTINUED)

4. Stimulate other proprioceptive areas to reinforce cerebellar learning.

   Ex) Shoulder paraspinals, rhomboids, achillies tendon.

5. Adjust posture in standing position if possible or lying down or sitting.

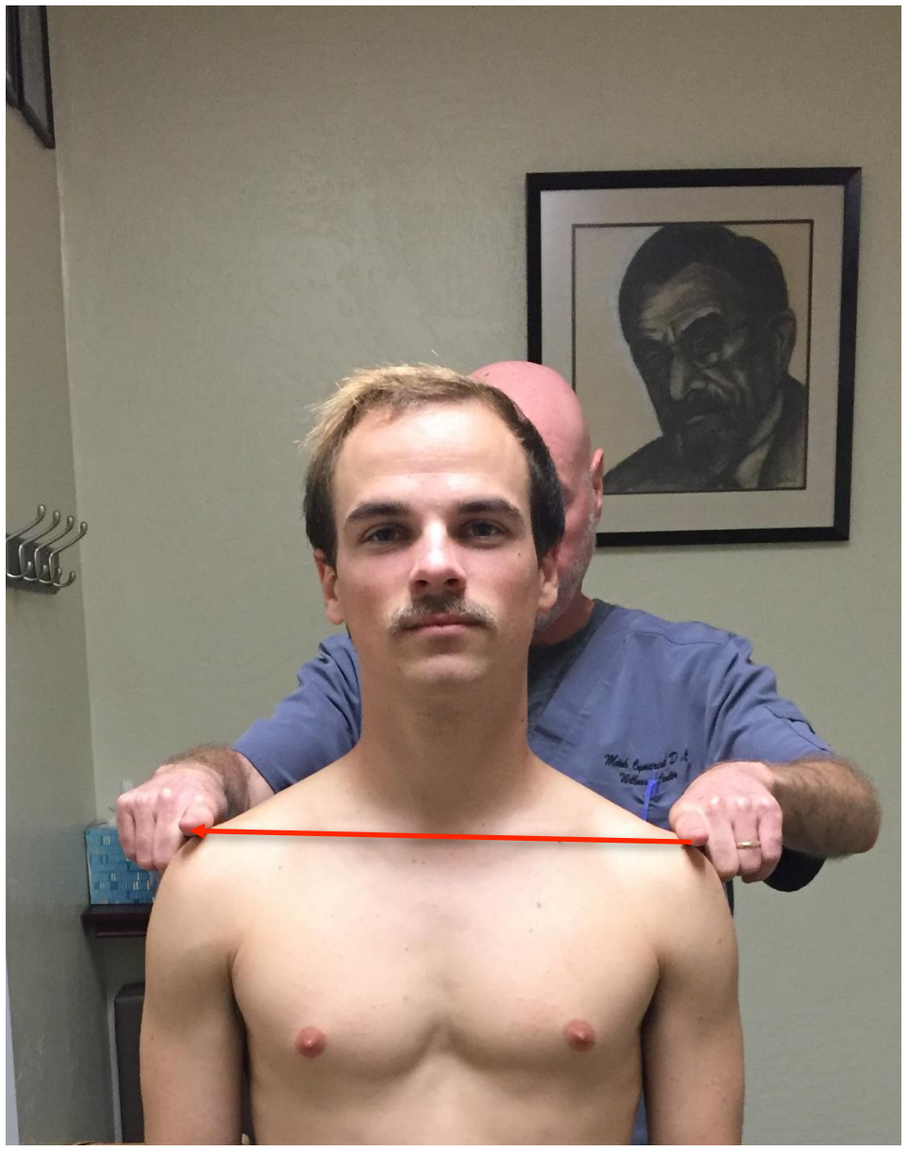
6. Deviations/Translations Cervical/Lumbar

   - Lying down with posture blocks (preferred set up).

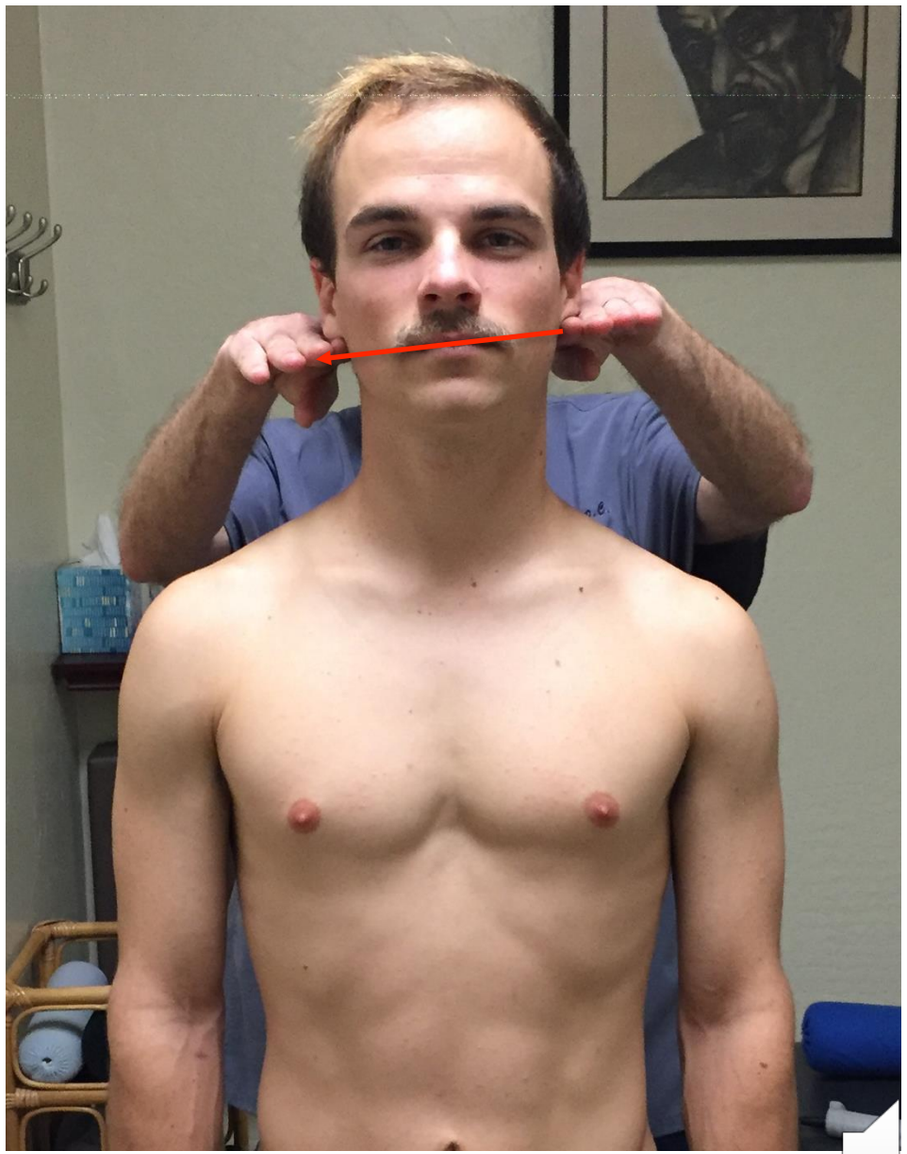
7. Always balance posture last.

POSTURE ANALYSIS EVALUATION OF A-P POSTURE

Is when you put the patient into the opposite postural pattern than what the patient originally presented with when they came in.
This process is called **Mirror Imaging**. It is also the set up for your posture correction.



Before
Right high
Shoulder



Before
Right head
tilt

POSTURE CORRECTION / INSTRUMENT PROPRIOCEPTIVE POSTURE BALANCING

Place patient in the opposite postural pattern with which they presented.

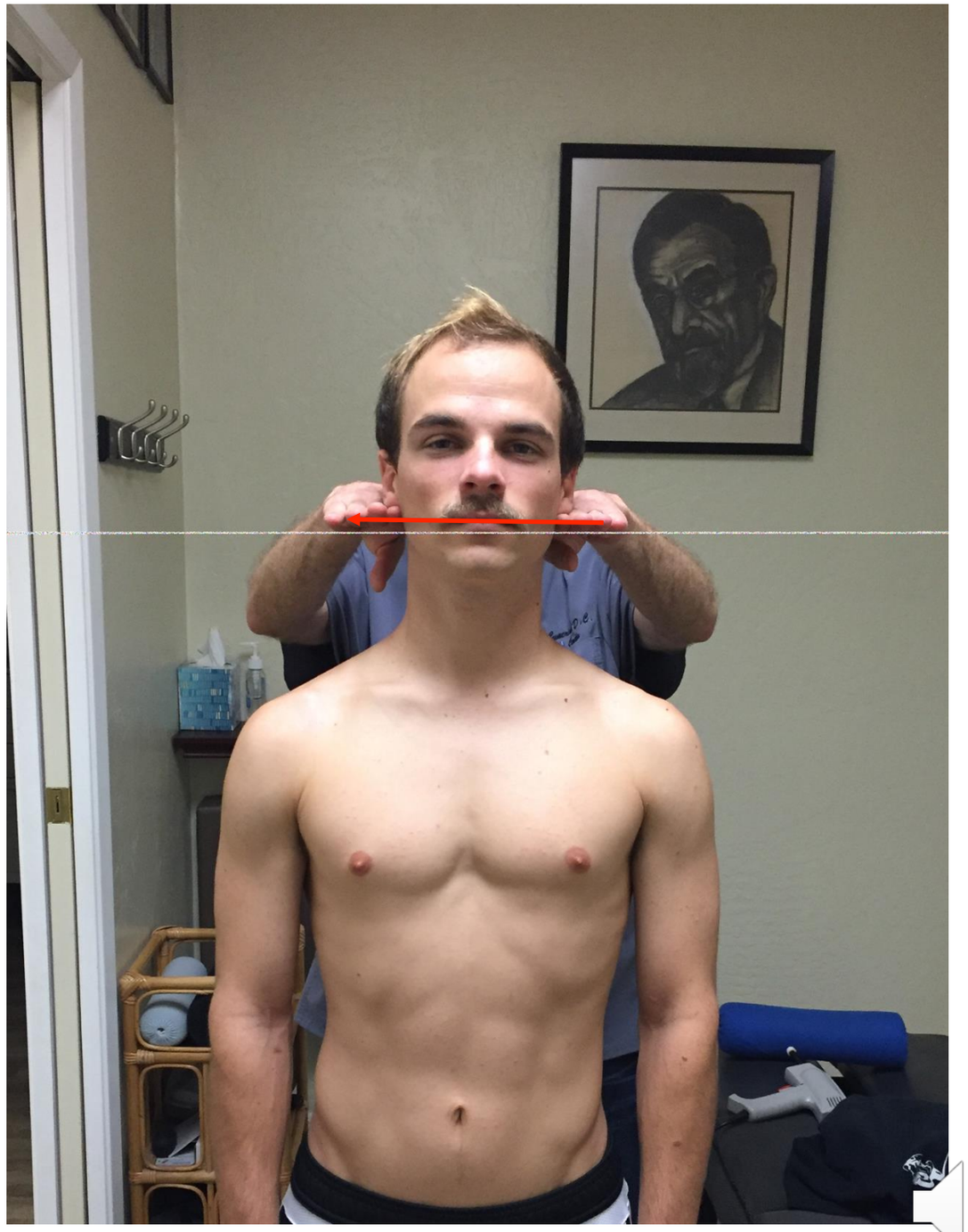
Right shoulder down

Tilt head to the left

After postural balancing.

After Shoulders level

After Head Level



POSTURAL ANALYSIS / EVALUATION OF LATERAL POSTURE

Patient presented with forward head carriage, rounded-forward shoulders, and slight *Dowager Hump.*

From the position that the patient presented, prior to posture correction:

A. Rotate shoulders all the way back, past neutral
B. Retract head straight back, as far as patient can go.
C. Stimulate with high-speed, low-force instrument areas o beds, including upper-cervical region and shoulder paraspinal region.

REMISSION OF DOWAGER'S HUMP BY MANIPULATIVE CORRECTION OF SPINAL ALIGNMENT: A CASE REPORT

Date & Journal: J Med Life. 2023 Jun

Abstract

Dowager's hump is described as excessive kyphotic curvature in the thoracic spine with a Cobb angle of more than 40 degrees. This case report presents a 61 years old female office clerk who experienced headaches and neck pain for 3 years that extended into her right shoulder and upper chest. She consulted her primary care physician two months before seeing the chiropractor when the neck pain worsened. A diagnosis of cervicalgia related to osteoarthritis was made based on cervical and thoracic X-ray findings. The patient received non-steroid anti-inflammatory drugs (celecoxib and etoricoxib) and stretching exercises at home. At the onset of chiropractic care, radiographs showed loss of cervical lordosis, narrowing at the C4-5, C5-C6, and C6-7 intervertebral disc space with marginal osteophytes. Based on these findings, a working diagnosis of cervicogenic headache was established. After treatment for 9 months, the patient showed improvement in symptoms and function from cervical curve radiographic change and dextro-convexity of the thoracic spine. Avoiding forward head flexion and maintaining correct posture in daily activities will be key mechanisms to prevent the reoccurrence of Dowager's hump. The improvement of symptoms following chiropractic therapy has been shown to correlate with radiographic markers of spinal realignment.

Chau C, Chu EC, Huang KH, Tam D, Cheung G. Remission of Dowager's hump by manipulative correction of spinal alignment: a case report. J Med Life. 2023 Jun;16(6):957-962. doi: 10.25122/jml-2023-0026. PMID: 37675179; PMCID: PMC10478669.

Posture Correction/ Instrument Proprioceptive Posture Balancing

POSTURAL CORRECTION / INSTRUMENT PROPRIOCEPTION OF LATERAL POSTURE

With the patient in the opposite/mirror-image posture, the correction includes:

A. Stimulating the upper-cervical region with a high-speed, low-force impulse that would communicate the corrected change through the proprioceptive neurological network and the cerebellum of the brain.

B. In the mirror-image posture, rotate shoulders and head posterior, and stimulate the paraspinal muscles, rhomboids, and even the spinus process at C7-T1.

HIGH-VELOCITY, LOW-AMPLITUDE SPINAL MANIPULATION TRAINING OF PRESCRIBED FORCES AND THRUST DURATION: A PILOT STUDY.

DATE & JOURNAL: J CHIROPR EDUC. 2019 APR 5

- OBJECTIVE: High-velocity, low-amplitude spinal manipulation (HVLA-SM) may generate different therapeutic effects depending on force and duration characteristics. Variability among clinicians suggests training to target specific thrust duration and force levels is necessary to standardize dosing. This pilot study assessed an HVLA-SM training program using prescribed force and thrust characteristics.

- RESULTS: Error from peak force target, expressed as adjusted mean constant error (standard deviation), went from 107 N at baseline, to 0.2 N immediately after training, and 32 N (53) 8 weeks after training for the 350 N target, and 63 N (148), -6 N (58), and 9 N (87) for the 550 N target. Student median values met thrust duration target, but doctors' were >150 ms immediately after training.

- CONCLUSION: After participation in an HVLA-SM training program, participants more accurately delivered two prescribed peak forces, but accuracy decreased 1 week afterwards. Future HVLA-SM training research should include follow-up of 1 week or more to assess skill retention.

Shannon ZK, Vining RD, Gudavalli MR, Boesch RJ. High-velocity, low-amplitude spinal manipulation training of prescribed forces and thrust duration: A pilot study. J Chiropr Educ. 2020 Oct 1;34(2):107-115. doi: 10.7899/JCE-18-19. PMID: 30951380; PMCID: PMC

III. ADVANCED CHIROPRACTIC ADJUSTIVE TECHNIQUE

A. OVERVIEW OF CLINICAL POSTURE NEUROLOGY

1. Functional Movement Techniques using kinesiology tape for posture correction.

B. POSTURE ANALYSIS / EVALUATION OF A TO P AND LATERAL POSTURES

Posture Correction/ Instrument Proprioceptive Posture Balancing

Posture & Systemic Health- A review of the medical literature

Forward head posture research in children & Pediatric posture evaluation and correction

A current review of neurology literature including: posture, proprioception & posture, and conditions commonly treated by chiropractic methods.

Posture & Systemic Health:
A review of the medical literature

Posture & Systemic Health:
A review of the medical literature

- **The cerebellum increased in size in the course of vertebrate evolution. The large size in the human brain coincides with the need for synergy of muscles, especially for the maintenance of the erect posture. - The Human Nervous System: An Anatomical viewpoint. Murray Barr and John Kieman**

- **The cerebellum is responsible for the regulation and control of muscular tone, the coordination of movement, and the control of posture and gait. - Principles of Neurology. Raymond Adams, Maurice Victor, Allan Roper, McGraw-Hill 1997**

- **The cerebellar input originates in proprioceptors and exteroceptors and is conveyed by massive afferent channels like the spinocerebellar, cuneocerebellar and vestibulocerebellar tracts. This input provides raw data about the condition and interrelationships of parts of the skeletomuscular system and of the body as a whole.**

POSTURE-RELATED DIFFERENCES IN CARDIOVASCULAR FUNCTION BETWEEN YOUNG MEN AND WOMEN: STUDY OF NONINVASIVE HEMODYNAMICS IN RURAL MALAWI

Date & Journal: J Am Heart Assoc . 2022 Mar.

Abstract

Background Cardiovascular risk is higher in men than in women, but little information exists about sex-related differences in cardiovascular function from low-income countries. We compared hemodynamics between sexes in rural Malawi in a cohort followed up since their birth. Methods and Results Supine, seated, and standing hemodynamics were recorded from 251 women and 168 men (mean age, 21 years; body mass index, 21 kg/m^2) using oscillometric brachial waveform analyses (Mobil-O-Graph). The results were adjusted for estimated glomerular filtration rate, and plasma potassium, lipids, and glucose. Men had higher brachial and aortic systolic blood pressure and stroke index regardless of posture (P<0.001), and higher upright but similar supine diastolic blood pressure than women. Regardless of posture, heart rate was lower in men (P<0.001), whereas cardiac index did not differ between sexes. Women presented with lower supine and standing systemic vascular resistance index (P<0.001), whereas supine-to-standing increase in vascular resistance (P=0.012) and decrease in cardiac index (P=0.010) were higher in women. Supine left cardiac work index was similar in both sexes, whereas standing and seated left cardiac work index was higher in men than in women (P<0.001). Conclusions In young Malawian adults, men had higher systolic blood pressure, systemic vascular resistance, and upright cardiac workload, whereas women presented with higher posture-related changes in systemic vascular resistance and cardiac output. These findings show systematic sex-related differences in cardiovascular function in a cohort from a low-income country with high exposure to prenatal and postnatal malnutrition and infectious diseases.

Choudhary MK, Penninkangas RM, Eräranta A, Niemelä O, Mangani C, Maleta K, Ashorn P, Ashorn U, Pörsti I. Posture-Related Differences in Cardiovascular Function Between Young Men and Women: Study of Noninvasive Hemodynamics in Rural Malawi. J Am Heart Asso

HEMODYNAMIC RESPONSE TO POSITIVE END-EXPIRATORY PRESSURE AND PRONE POSITION IN COVID-19 ARDS.

Date & Journal: Respir Physiol Neurobiol . 2022 Apr.

Abstract

Background: Use of high positive end-expiratory pressure (PEEP) and prone positioning is common in patients with COVID-19-induced acute respiratory failure. Few data clarify the hemodynamic effects of these interventions in this specific condition. We performed a physiologic study to assess the hemodynamic effects of PEEP and prone position during COVID-19 respiratory failure.

Results: High PEEP improved PaO_2/FiO_2 ratio in all patients (p = 0.004), and significantly decreased pulmonary shunt fraction (p = 0.012), regardless of lung recruitability. PEEP-induced increases in PaO2/FiO2 changes were strictly correlated with shunt fraction reduction (rho=-0.82, p = 0.01). From low to high PEEP, cardiac output decreased by 18 % (p = 0.05) and central venous pressure increased by 17 % (p = 0.015). As compared to supine position with low PEEP, prone positioning significantly decreased pulmonary shunt fraction (p = 0.03), increased PaO_2/FiO_2 (p = 0.03) and mixed venous oxygen saturation (p = 0.016), without affecting cardiac output. PaO_2/FiO_2 was improved by prone position also when compared to high PEEP (p = 0.03).

Conclusions: In patients with moderate-to-severe ARDS due to COVID-19, PEEP and prone position improve arterial oxygenation. Changes in cardiac output contribute to the effects of PEEP but not of prone position, which appears the most effective intervention to improve oxygenation with no hemodynamic side effects.

Dell'Anna AM, Carelli S, Cicetti M, Stella C, Bongiovanni F, Natalini D, Tanzarella ES, De Santis P, Bocci MG, De Pascale G, Grieco DL, Antonelli M. Hemodynamic response to positive end-expiratory pressure and prone position in COVID-19 ARDS. Respir Physi

TRANSDERMAL AURICULAR VAGUS STIMULATION FOR THE TREATMENT OF POSTURAL TACHYCARDIA SYNDROME

Date & Journal: Auton Neurosci . 2021 Dec.

Abstract

Postural Tachycardia Syndrome (POTS) is a chronic disorder characterized by symptoms of orthostatic intolerance such as fatigue, lightheadedness, dizziness, palpitations, dyspnea, chest discomfort and remarkable tachycardia upon standing. Non-invasive transdermal vagal stimulators have been applied for the treatment of epilepsy, anxiety, depression, headache, and chronic pain syndromes. Anti-inflammatory and immunomodulating effects after transdermal vagal stimulation raised interest for applications in other diseases. Patients with sympathetic overactivity, reduced cardiac vagal drive and presence of systemic inflammation like POTS may benefit from tVNS. This article will address crucial methodological aspects of tVNS and provide preliminary results of its acute and chronic use in POTS, with regards to its potential effectiveness on autonomic symptoms reduction and heart rate modulation.

Diedrich A, Urechie V, Shiffer D, Rigo S, Minonzio M, Cairo B, Smith EC, Okamoto LE, Barbic F, Bisoglio A, Porta A, Biaggioni I, Furlan R. Transdermal auricular vagus stimulation for the treatment of postural tachycardia syndrome. Auton Neurosci. 2021 Dec

INVOLVING PATIENTS AND CLINICIANS IN A PILOT RANDOMISED CLINICAL TRIAL OF SPINAL MANUAL THERAPY VERSUS NERVE ROOT INJECTION FOR LUMBAR RADICULOPATHY: PROTOCOL OF A PATIENT AND PUBLIC INVOLVEMENT PROJECT

Date & Journal: BMJ Open . 2022 Apr 25.

Abstract

Introduction: A patient and public involvement (PPI) project will be embedded within the SALuBRITY pilot trial, a two parallel group, double sham controlled, randomised clinical trial. The study aims to compare the effectiveness of spinal manual therapy and corticosteroid nerve root injections, two methods commonly used to treat patients with lumbar radiculopathy. We aim to gather patients' and clinicians' perspectives and involve them in decisions related to the research question and objectives, proposed trial recruitment processes and methods, and proposed outcome measures.

Methods & Analysis: A small group of patients with lived experience of lumbar radiculopathy and primary care clinicians with experience in the treatment of patients with lumbar radiculopathy are involved. An initial kickoff event will prepare and empower the advisors for involvement in the project, followed by semistructured patient group and one-on-one clinician interviews. We will follow the Critical Outcomes of Research Engagement framework for assessing the impact of patient engagement in research. We will summarise and feedback PPI content to the patient and clinician advisors during a member-checking process to ensure accurate interpretation of patient and clinician inputs. Inductive and deductive thematic analysis will be used for the qualitative analysis of the interviews. Two surveys will be completed at different points along the trial to track the advisors' and researchers' experiences over the course of the PPI project. Any modifications to the SALuBRITY trial methods due to PPI inputs will be thoroughly documented and recorded in an impact log.

Ethics and dissemination: The independent research ethics committee of Canton Zurich confirmed that ethical approval for this PPI subproject was not required. PPI results will be disseminated in a peer-reviewed journal and presented at conferences.

Ryf C, Hofstetter L, Clack L, Puhan MA, Hincapié CA. Involving patients and clinicians in a pilot randomised clinical trial of spinal manual therapy versus nerve root injection for lumbar radiculopathy: protocol of a patient and public involvement project

SUBJECTIVE STABILITY PERCEPTION IS RELATED TO POSTURAL ANXIETY IN OLDER SUBJECTS.

DATE & JOURNAL: GAIT POSTURE. 2019 FEB

BACKGROUND:
Under static conditions, the objective and subjective measures of postural stability correlate well. However, age-related changes in postural control and task-related anxiety may modify the relationship between these subjective and objective measures. Ultimately, patients' symptoms represent subjective reports, thus understanding this relationship has clinical implications.

DISCUSSION:
Subjects accurately rate their own instability during dynamic postural challenges, irrespective of age and actual fall risk. However, anxiety may selectively modulate the perception of instability in older subjects. The perception of stability relies upon the integration of sensory afferents but also recruits emotional-cognitive processes, particularly in older individuals. The use of a safety harness has no influence on subjective or objective postural stability.

Castro P, Kaski D, Schieppati M, Furman M, Arshad Q, Bronstein A. Subjective stability perception is related to postural anxiety in older subjects. Gait Posture. 2019 Feb;68:538-544. doi: 10.1016/j.gaitpost.2018.12.043. Epub 2019 Jan 2. PMID: 30634135.

FLEXED POSTURE IN PARKINSON DISEASE: ASSOCIATIONS WITH NON-MOTOR IMPAIRMENTS & ACTIVITY LIMITATIONS.

DATE & JOURNAL: PHYS THER. 2019 MAR 4

BACKGROUND: People with Parkinson disease (PD) are twice as likely to develop flexed truncal posture as the general older population. Little is known about the mechanisms responsible beyond associations with age, axial motor impairments, and disease severity.

OBJECTIVE: The objective was to explore: (1) the associations of the non-motor impairments of PD with flexed posture and (2) the relationships of flexed posture with activity limitations.

CONCLUSIONS: Spinal proprioception and postural fatigue were the only non-motor impairments to make significant contributions to flexed posture. Given the negative influence of flexed posture on upper limb activity and respiratory function, interventions targeting spinal proprioception and postural awareness should be considered for people with PD who may develop flexed posture.

Forsyth AL, Joshi RY, Canning CG, Allen NE, Paul SS. Flexed Posture in Parkinson Disease: Associations With Nonmotor Impairments and Activity Limitations. Phys Ther. 2019 Jul 1;99(7):893-903. doi: 10.1093/ptj/pzz033. PMID: 30830153.

PROPRIOCEPTIVE MUSCLE TENDON STIMULATION REDUCES SYMPTOMS IN PRIMARY ORTHOSTATIC TREMOR

Date & Journal: J Neurol. 2018 July.

INTRODUCTION: Primary orthostatic tremor (OT) is characterized by high-frequency lower limb muscle contractions and a disabling sense of unsteadiness while standing. To date, therapeutic options for OT are limited. Here, we examined the effects of proprioceptive leg muscle stimulation via muscle tendon vibration (MTV) on tremor and balance control in patients with primary OT.

CONCLUSION: Proprioceptive stimulation did not reset tremor frequency consistent with the presumed central origin of OT. However, continuous MTV influenced the emergence of OT symptoms resulting in reduced tremor intensity, improved posture, and a relief from unsteadiness in half of the examined patients. These findings indicate that MTV either directly interferes with the peripheral manifestation of the central oscillatory pattern or prevents proprioceptive afferent feedback from becoming extensively synchronized at the tremor frequency.

Wuehr M, Schlick C, Möhwald K, Schniepp R. Proprioceptive muscle tendon stimulation reduces symptoms in primary orthostatic tremor. J Neurol. 2018 Jul;265(7):1666-1670. doi: 10.1007/s00415-018-8902-z. Epub 2018 May 16. PMID: 29767354.

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1. Arvin M, van Dieën J, Faber G, Pijnappels M, Hoozemans M, Verschueren S. Hip abductor neuromuscular capacity: A limiting factor in mediolateral balance control in older adults?. *Clinical Biomechanics*. 2016;37:27-33. doi:10.1016/j.clinbiomech.2016.05.015.

2. 2. Arvin M, van Dieën J, Faber G, Pijnappels M, Hoozemans M, Verschueren S. Hip abductor neuromuscular capacity: A limiting factor in mediolateral balance control in older adults?. *Clinical Biomechanics*. 2016;37:27-33. doi:10.1016/j.clinbiomech.2016.05.015.

3. Hincapie O, Elkins J, Vasquez-Welsh L. Proprioception retraining for a patient with chronic wrist pain secondary to ligament injury with no structural instability. *Journal of Hand Therapy*. 2016;29(2):183-190. doi:10.1016/j.jht.2016.03.008.

4. Huang C, Chang G, Tsai Y, Hwang I. An Increase in Postural Load Facilitates an Anterior Shift of Processing Resources to Frontal Executive Function in a Postural-Suprapostural Task. *Frontiers in Human Neuroscience*. 2016;10. doi:10.3389/fnhum.2016.00420.

FORWARD HEAD POSTURE RESEARCH

Evaluation of forward head posture and thoracic kyphosis in migraine

DATE & JOURNAL: J CLIN NEUROSCI. 2024 JAN

Abstract

Background: The purpose of the current study was to investigate the forward head posture (FHP), thoracic kyphosis and their relationships between individuals with migraine and healthy controls using the DIERS Formetric 4D motion imaging system.

Results: The fleche cervicale (57.72 ± 13.72 mm vs. 40.00 ± 4.75 mm; $p < 0.001$) and kyphotic angle (57.39 ± 8.76° vs. 38.21 ± 5.67°; $p < 0.001$) were significantly higher in patients with migraine compared to control group. When NDI categories were compared, the migraine group showed significantly increase in the number of patients with moderate or severe disability ($p < 0.001$). A positive correlation was found between fleche cervicale and thoracic kyphosis ($r = 0.71$, $p < 0.001$).

Conclusions: This study revealed that patients with migraine exhibited a greater FHP and thoracic kyphosis compared to the control group. A 3-dimensional objective measurement may be a reliable diagnostic tool to evaluate posture analysis in clinical practice in the future.

Ozudogru Celik T, Gorgulu U, Kenar SG, Koca N, Yalcin E, Koymen I, Yasar E. Evaluation of forward head posture and thoracic kyphosis in migraine. J Clin Neurosci. 2024 Jan;119:17-21. doi: 10.1016/j.jocn.2023.11.018. Epub 2023 Nov 16. PMID: 37976910.

The treatment and rationale for the correction of a cervical kyphosis spinal deformity in a cervical asymptomatic young female: a Chiropractic BioPhysics® case report with follow-up

DATE & JOURNAL: J PHYS THER SCI. 2023 MAY

Abstract

[Purpose] To present a case demonstrating dramatic restoration of the cervical lordosis and reduction of forward head posture by use of Chiropractic BioPhysics® (CBP®) technique. [Participant and Methods] A 24-year-old cervical asymptomatic female presented with poor craniocervical posture. Radiography revealed forward head posture and an exaggerated cervical kyphosis. [Results] The patient received CBP care including mirror image® cervical extension exercises, cervical extension traction and spinal manipulative therapy. After 36 treatments over 17-weeks, repeat radiography demonstrated a dramatic improvement of an alteration of the cervical kyphosis to a lordosis and a reduction of forward head posture. Subsequent treatment increased the lordosis further. Long-term follow-up at 3.5 years showed some loss of original correction, however, a maintenance of the global lordosis. [Conclusion] This case demonstrates that non-surgical reversal of a cervical kyphosis to a lordosis is possible in a short time using CBP cervical extension protocols. It is logical if the kyphosis had not been corrected, over time, osteoarthritis and various craniovertebral symptoms would have evolved as the literature indicates. The diagnosis of gross spinal deformity, we argue, requires its correction prior to the onset of symptoms and permanent degenerative changes.

Oakley PA, Kallan SZ, Haines LD, Harrison DE. The treatment and rationale for the correction of a cervical kyphosis spinal deformity in a cervical asymptomatic young female: a Chiropractic BioPhysics® case report with follow-up. J Phys Ther Sci. 2023 May;

Resolution of Chronic Migraine Headaches and Improvement in Cervical Spine Kyphosis Following Chiropractic BioPhysics® (CBP®) Treatment: A Case Report With a Seven-Month Follow-Up

DATE & JOURNAL: CUREUS. 2024 SEP 22

Abstract

We present a chronic migraine (CM) patient demonstrating significant improvement in subjective and objective reported outcome measures with deeper cervical lordosis parameters and reduced forward head posture on radiographs. A 29-year-old male suffered from CM reporting significant pain and disability with aural, sensory, and motor disturbances during the migraine headaches. Aura with visual disturbances, abnormal facial and extremity sensation, sporadic motor weakness, and other signs of CM were found in the patient's history since age 10. The patient reported previous physical therapy, manual chiropractic, and over-the-counter medications. Migraine-specific prescriptions without long-term reduction in pain and disability were reported. The pain and suffering had been reported to be worsening, and he sought Chiropractic BioPhysics® (CBP®) spine and postural rehabilitation protocols. These protocols were used to increase cervical lordosis, reduce coronal imbalances, increase mobility, and create better posture. These protocols include specific prescriptions based on radiography for postural exercises, postural mirror image® (MI®)traction, and specific spinal manipulative therapy (SMT) focused on posture. All outcome measures improved with the resolution of all initial symptoms of CM. There was a 16° improvement in cervical lordosis, a 30% decrease in headache disability, and additional improvements. These improvements were maintained at a seven-month follow-up during which the patient received infrequent maintenance treatments. This successful treatment of a patient with CM with long-term follow-up adds to evidence that CBP® spinal structural rehabilitation may prove effective and serve as a possible tool for clinicians, physicians, and therapists to treat CM.

Oakley PA, Haas JW, Woodham TJ, Fortner MO, Harrison DE. Resolution of Chronic Migraine Headaches and Improvement in Cervical Spine Kyphosis Following Chiropractic BioPhysics® (CBP®) Treatment: A Case Report With a Seven-Month Follow-Up. Cureus. 2024 Sep

COMPARISON OF IMMEDIATE EFFECTS OF SLING-BASED MANUAL THERAPY ON SPECIFIC SPINE LEVELS IN SUBJECTS WITH NECK PAIN AND FORWARD HEAD POSTURE: A RANDOMIZED CLINICAL TRIAL.

DATE & JOURNAL: DISABIL REHABIL . 2020 SEP.

Abstract

Purpose: Forward head posture is identified as the flexion of the lower cervical spine along with the extension of the upper cervical spine, with an overall increase in the cervical curve. This study aimed to compare the immediate effect of upper-cervical level and cervicothoracic junction level manual therapy on head posture, cervical range of motion and muscle activity of the subjects with forward head posture.

Conclusion: Cervicothoracic junction manual therapy improved cervical alignment, cervical mobility (extension, rotation), and muscle recruitment ability in subjects with forward head posture. These observations may partially explain the efficacy of this manual therapy in rehabilitation of individuals with mechanical neck disorder (with forward head posture). Implications for rehabilitation: Cervicothoracic area manual therapy in subjects with neck pain and forward head posture better improved the muscle recruitment ability than upper cervical area manual therapy during motor tasks.

Kim DH, Kim SY. Comparison of immediate effects of sling-based manual therapy on specific spine levels in subjects with neck pain and forward head posture: a randomized clinical trial. Disabil Rehabil. 2020 Sep;42(19):2735-2742. doi: 10.1080/09638288.2019.1571638. Epub 2019 Feb 13. PMID: 30757926.

THE EFFECTS OF FORWARD HEAD POSTURE ON EXPIRATORY MUSCLE STRENGTH IN CHRONIC NECK PAIN PATIENTS: A CROSS-SECTIONAL STUDY.

DATE & JOURNAL: TURK J PHYS MED REHABIL . 2020 MAY 18.

Abstract

Objectives: This study aims to investigate the relationship between forward head posture (FHP) and respiratory dysfunctions in patients with chronic neck pain.

Results: There was a negative correlation between the FHPmm with Pe_{max}% (rho: -0.314; p=0.005). A negative correlation was also observed between C7° and Pe_{max}, Pe_{max}%, forced expiratory volume in one sec (FEV1)/forced vital capacity (FVC)%, forced expiratory flow (FEF)25-75%, and FEF75% (rho:-0.245, -0.349, -0.218, -0.214, and -0.259 respectively; p=0.028, 0.002, 0.035, 0.040, and 0.012, respectively). There was a positive correlation between neck disability and VAS scores (rho: 0.424; p<0.001), while there was a negative correlation between neck disability and chest expansion, maximum voluntary ventilation (rho: -0.201 and -0.217, respectively; p=0.049 and 0.046, respectively).

Conclusion: Based on our study results, FHP is associated with expiratory muscle weakness in chronic neck pain patients. To evaluate respiratory dysfunction, chest expansion tests may be useful, although these tests are not specific to muscle weakness. Interventions about FHP and neck pain should focus on the effects of respiratory muscle training.

Solakoğlu Ö, Yalçın P, Dinçer G. The effects of forward head posture on expiratory muscle strength in chronic neck pain patients: A cross-sectional study. Turk J Phys Med Rehabil. 2020 May 18;66(2):161-168. doi: 10.5606/tftrd.2020.3153. PMID: 32760893; PMCID: PMC7401676.

ALLEVIATION OF CHRONIC SPINE PAIN AND HEADACHES BY REDUCING FORWARD HEAD POSTURE AND THORACIC HYPERKYPHOSIS: A CBP® CASE REPORT.

DATE & JOURNAL: J PHYS THER SCI. 2018 AUG

Purpose: This case presents the reduction of both forward head posture and thoracic hyperkyphosis in a young male with chronic back pain and headaches by a comprehensive posture rehabilitation program as a part of Chiropractic BioPhysics® methods.

Results: After treatment the patient reported dramatic improvement in symptoms as indicated on valid disability questionnaires and substantial improvements in posture.

Conclusion: Posture-related pain and disability is not often addressed in allopathic medicine but substantial posture improvements are achievable in short time periods as this case illustrates. Poor postures in young patients should be corrected to avoid long-term consequences. Radiography as used in spinal rehabilitation is safe and reliable.

Fortner MO, Oakley PA, Harrison DE. Alleviation of chronic spine pain and headaches by reducing forward head posture and thoracic hyperkyphosis: a CBP® case report. J Phys Ther Sci. 2018 Aug;30(8):1117-1123. doi: 10.1589/jpts.30.1117. Epub 2018 Aug 7. PMID: 30154612; PMCID: PMC6110208.

IMPROVING POSTURE TO REDUCE THE SYMPTOMS OF PARKINSON'S: A CBP® CASE REPORT WITH A 21 MONTH FOLLOW-UP.

DATE & JOURNAL: J PHYS THER SCI. 2019 FEB

Purpose: To demonstrate the reduction of symptoms related to Parkinson's disease by improvement in posture.

Results:
After 38 treatments over 5 months, the patient had significant improvements in posture alignment as well as gait, balance, hand tremors, low back and knee pains and SF-36 values. A 21 month follow-up revealed the patient had remained essentially well and the initial postural improvements were maintained.

Conclusion: This case demonstrates improvement of various symptoms in a patient with Parkinson's disease. Since poor posture is a long known clinical manifestation of this disorder, it is proposed that the improvement of posture in these patients may lead to improved outcomes. X-ray use in the diagnosis and management in those with spine deformity is safe and not carcinogenic.

Anderson JM, Oakley PA, Harrison DE. Improving posture to reduce the symptoms of Parkinson's: a CBP® case report with a 21 month follow-up. J Phys Ther Sci. 2019 Feb;31(2):153-158. doi: 10.1589/jpts.31.153. Epub 2019 Feb 7. PMID: 30858655; PMCID: PMC6382490.

NON-SURGICAL RELIEF OF CERVICAL RADICULOPATHY THROUGH REDUCTION OF FORWARD HEAD POSTURE AND RESTORATION OF CERVICAL LORDOSIS: A CASE REPORT.

DATE & JOURNAL: J PHYS THER SCI. 2017 AUG

Purpose:
To present a case demonstrating the relief of cervical radiculopathy following the dramatic reduction of forward head posture and restoration of the cervical lordosis by use of a multi-modal rehabilitation program incorporating cervical extension traction.

Results:
The patient received a multi-modal rehabilitation protocol including mirror image extension exercises, cervical extension traction, and spinal manipulative therapy. After forty treatments over 17 weeks, the patient reported a complete resolution of radiculopathy and significant improvement in neck pain level. Post radiography demonstrated correction of the spine and posture alignment. The patient remained well and maintained corrected posture with limited treatment one year later.

Conclusion:
Our case demonstrates the relief of cervical radiculopathy resulting from the non-surgical correction of forward head posture and cervical kyphosis.

Wickstrom BM, Oakley PA, Harrison DE. Non-surgical relief of cervical radiculopathy through reduction of forward head posture and restoration of cervical lordosis: a case report. J Phys Ther Sci. 2017 Aug;29(8):1472-1474. doi: 10.1589/jpts.29.1472. Epub 2017 Aug 10. PMID: 28878485; PMCID: PMC5574331.

FORWARD HEAD POSTURE RESEARCH IN CHILDREN

THE INFLUENCE OF BACKPACK WEIGHT IN SCHOOL CHILDREN: GAIT, MUSCLE ACTIVITY, POSTURE AND STABILITY

DATE & JOURNAL: ORTHOPADE. 2021 JUN

ABSTRACT

Background: wearing a school backpack every day may cause postural problems and affect the gait pattern of children and adolescents. the aim of the present study was to analyze the influence of a 4 kg backpack load on the gait pattern and postural sway.

Results: the backpack load, on average 15% of the body weight, led to a slower walking speed, shorter step length and increased double-support phase. increased anterior pelvic and trunk tilt, as well as hip flexion were also observed. furthermore, the muscle activity and postural sway of the children were affected by the increased load.

Conclusions: school backpacks weighing 4 kg caused changes in gait, muscle activity, posture and stability in elementary school children. due to the weight of the backpack, the centre of mass shifted backwards and the children became less stable. during gait, this was compensated by increased anterior pelvic and trunk tilt and increased hip flexion. the activity of the paraspinal muscles was decreased and indicates that the backpack is carried passively. this may cause a negative long-term effect.

Hell AK, Braunschweig L, Grages B, Brunner R, Romkes J. Einfluss des Schulrucksackgewichtes bei Grundschulkindern: Gang, Muskelaktivität, Haltung und Stabilität [The influence of backpack weight in school children: gait, muscle activity, posture and stability]. Orthopade. 2021 Jun;50(6):446-454. German. doi: 10.1007/s00132-020-04047-8. Epub 2020 Dec 9. PMID: 33296024; PMCID: PMC8189948.

CHARACTERIZATION OF CERVICAL SPINE IMPAIRMENTS IN CHILDREN AND ADOLESCENTS POST-CONCUSSION.

DATE & JOURNAL: INT J SPORTS PHYS THER. 2019 APRIL

BACKGROUND: PATIENTS WITH CONCUSSION MAY PRESENT WITH CERVICAL SPINE IMPAIRMENTS, THEREFORE ACCURATE CHARACTERIZATION OF CERVICAL POST-CONCUSSION IMPAIRMENTS IS NEEDED TO DEVELOP TARGETED PHYSICAL THERAPY INTERVENTIONS.

PURPOSE: TO CHARACTERIZE THE TYPE, FREQUENCY AND SEVERITY OF CERVICAL IMPAIRMENTS IN CHILDREN AND ADOLESCENTS REFERRED FOR PHYSICAL THERAPY AFTER CONCUSSION.

CONCLUSION: HIGH PREVALENCE OF CERVICAL SPINE IMPAIRMENTS WAS OBSERVED IN THE SUBJECTS INCLUDED IN THIS STUDY WITH MUSCLE TENSION, JOINT MOBILITY, AND MUSCLE STRENGTH BEING MOST COMMONLY AFFECTED. THE CATEGORIES OF IMPAIRMENTS EXAMINED IN THIS COHORT WERE CONSISTENT WITH THE RECOMMENDATIONS OF THE MOST RECENT CLINICAL PRACTICE GUIDELINES FOR NECK PAIN. THIS STUDY PROVIDES PRELIMINARY DATA TO SUPPORT THE FRAMEWORK FOR A CERVICAL SPINE EVALUATION TOOL IN CHILDREN AND ADOLESCENTS FOLLOWING CONCUSSION.

Tiwari D, Goldberg A, Yorke A, Marchetti GF, Alsalaheen B. CHARACTERIZATION OF CERVICAL SPINE IMPAIRMENTS IN CHILDREN AND ADOLESCENTS POST-CONCUSSION. Int J Sports Phys Ther. 2019 Apr;14(2):282-295. PMID: 30997280; PMCID: PMC6449018.

EFFECT OF DURATION OF SMARTPHONE USE ON MUSCLE FATIGUE AND PAIN CAUSED BY FORWARD HEAD POSTURE IN ADULTS.

Date & Journal: J Phys Ther Sci . 2016 Jun.

- [Purpose] The effect of duration of smartphone use on neck and shoulder muscle fatigue and pain was investigated in adults with forward head posture.

- [Results] There was a significant difference in the degree of fatigue in the left upper trapezius muscles in group 2 and left cervical erector spinae and bilateral upper trapeziuses group 3. There was a significant difference in fatigue in the left upper trapezius in groups 1 and 3. The VAS showed significant differences in all groups before and after the experiment and between groups 1 and 3.

- [Conclusion] Pain and fatigue worsened with longer smartphone use. This study provided data on the proper duration of smartphone use. Correct posture and breaks of at least 20 minutes are recommend when using smartphones.

Kim SY, Koo SJ. Effect of duration of smartphone use on muscle fatigue and pain caused by forward head posture in adults. J Phys Ther Sci. 2016 Jun;28(6):1669-72. doi: 10.1589/jpts.28.1669. Epub 2016 Jun 28. PMID: 27390391; PMCID: PMC4932032.

MUSCULOSKELETAL DISORDER AND PAIN ASSOCIATED WITH SMARTPHONE USE: A SYSTEMATIC REVIEW OF BIOMECHANICAL EVIDENCE.

DATE & JOURNAL: HONG KONG PHYSIOTHER J. 2018 DEC

The number of smartphone users is growing dramatically. Using the smartphone frequently forces the users to adopt an awkward posture leading to an increased risk of musculoskeletal disorders and pain. The objective of this study is to conduct a systematic review of studies that assess the effect of smartphone use on musculoskeletal disorders and pain. A systematic literature search of AMED, CINAHL, PubMed, Proquest, ScienceDirect using specific keywords relating to smartphone, musculoskeletal disorders and pain was conducted. Reference lists of related papers were searched for additional studies. Methodological quality was assessed by two independent reviewers using the modified Downs and Black checklist. From 639 reports identified from electronic databases, 11 were eligible to include in the review. One paper was found from the list of references and added to the review. The quality scores were rated as moderate. The results show that muscle activity of upper trapezius, erector spinae and the neck extensor muscles are increased as well as head flexion angle, head tilt angle and forward head shifting which increased during the smartphone use. Also, smartphone use in a sitting position seems to cause more shift in head-neck angle than in a standing position. Smartphone usage may contribute to musculoskeletal disorders. The findings of the included papers should be interpreted carefully in light of the issues highlighted by the moderate-quality assessment scores.

Eitivipart AC, Viriyarojanakul S, Redhead L. Musculoskeletal disorder and pain associated with smartphone use: A systematic review of biomechanical evidence. Hong Kong Physiother J. 2018 Dec;38(2):77-90. doi: 10.1142/S1013702518300010. Epub 2018 Aug 14. P

Remember to look up!

0° degrees
10 - 12 lbs

15° degrees
27 lbs

30° degrees
40 lbs

45° degrees
49 lbs

60° degrees
60 lbs

Combat
Tech-Neck

COMPARISON OF ACTIVE VERSUS PASSIVE SURVEILLANCE ADVERSE EVENT REPORTING IN A PEDIATRIC AMBULATORY CHIROPRACTIC CARE SETTING: A CLUSTER RANDOMISED CONTROLLED TRIAL

Date & Journal: BMJ Open Qual . 2020 Nov.

Abstract

Objectives: This pragmatic, cluster, stratified randomised controlled trial (RCT) compared the quantity and quality of adverse event (AE) reports after chiropractic manual therapy in children less than 14 years of age, using active versus passive surveillance reporting systems.

Results: Ninety-six chiropractors agreed to participate and enrolled in the study: 34 chiropractors in active surveillance with 1894 patient visits from 1179 unique patients and 35 chiropractors in passive surveillance with 1992 patient visits from 1363 unique patients. In the active arm, AEs were reported in 8.8% (n=140, 95% CI 6.72% to 11.18%) of patients/caregivers, compared with 0.1% (n=2, 95% CI 0.02% to 0.53%) in the passive arm (p<0.001). The quality of AE reports was not evaluated because the five AE reports reviewed by the content experts were determined to be of mild severity.

Conclusion: We found that active surveillance resulted in significantly more AE reports than passive surveillance. Further prospective active surveillance research studies should be conducted with children receiving chiropractic manual therapy to understand mechanisms and risk factors for moderate and severe AEs, and to further explore how and when to solicit patient safety information.

Pohlman KA, Carroll L, Tsuyuki RT, Hartling L, Vohra S. Comparison of active versus passive surveillance adverse event reporting in a paediatric ambulatory chiropractic care setting: a cluster randomised controlled trial. BMJ Open Qual. 2020 Nov;9(4):e000

CHANGE IN YOUNG PEOPLE'S SPINE PAIN FOLLOWING CHIROPRACTIC CARE AT A PUBLICLY FUNDED HEALTHCARE FACILITY IN CANADA

Date & Journal: Complement Ther Clin Pract . 2019 May.

Abstract

Background: The presence of spinal pain in young people has been established as a risk factor for spinal pain later in life. Recent clinical practice guidelines recommend spinal manipulation (SM), soft tissue therapy, acupuncture, and other modalities that are common treatments provided by chiropractors, as interventions for spine pain. Less is known specifically on the response to chiropractic management in young people with spinal pain. The purpose of this manuscript was to describe the impact, through pain measures, of a pragmatic course of chiropractic management in young people's spinal pain at a publicly funded healthcare facility for a low-income population.

Results: Young people (defined as 10-24 years of age) demonstrated statistically and clinically significant improvement on the numeric rating scale (NRS) in all four spinal regions following chiropractic management.

Conclusion: The findings of the present study provide evidence that a pragmatic course of chiropractic care, including SM, mobilization, soft tissue therapy, acupuncture, and other modalities within the chiropractic scope of practice are a viable conservative pain management treatment option for young people.

Manansala C, Passmore S, Pohlman K, Toth A, Olin G. Change in young people's spine pain following chiropractic care at a publicly funded healthcare facility in Canada. Complement Ther Clin Pract. 2019 May;35:301-307. doi: 10.1016/j.ctcp.2019.03.013. Epub

PEDIATRIC NATURAL HEALTH PRODUCTS RECOMMENDED BY CHIROPRACTIC AND NATUROPATHIC DOCTORS IN CANADA

Date & Journal: Complement Ther Med . 2019 Apr.

Abstract

Objectives: To assess chiropractic (DC) and naturopathic doctors' (ND) pediatric care natural health product (NHP) recommendations.

Results: Of the 421 respondents seeing one or more pediatric patients per week, 172 (41%, 107 DCs, 65 NDs) provided 440 NHP recommendations, categorized as: vitamins and minerals (89 practitioners, 127 recommendations), probiotics (110 practitioners, 110 recommendations), essential fatty acids (EFAs: 72 practitioners, 72 recommendations), homeopathics (56 practitioners, 66 recommendations), botanicals (29 practitioners, 31 recommendations), and other NHPs (33 practitioners, 34 recommendations). Indications for the NHP recommendations were tabulated for NHPs with 10 or more recommendations in any age category: 596 total indications for probiotics, 318 indications for essential fatty acids, 138 indications for vitamin D, and 71 indications for multi-vitamins.

Conclusions: This is the first study documenting the pediatric NHP recommendations of two popular complementary medicine professions. Common NHPs at standard doses are the most frequently recommended products, with use and doses adjusted according to age. High-quality evidence regarding the efficacy, safety, and dosing for NHP use in children is scarce; development of evidence-informed pediatric guidelines is recommended, particularly for the most commonly used and recommended NHPs.

Porcino AJ, Solomonian L, Zylich S, Doucet C, Gluvic B, Vohra S. Pediatric natural health products recommended by chiropractic and naturopathic doctors in Canada. Complement Ther Med. 2019 Apr;43:196-200. doi: 10.1016/j.ctim.2019.02.001. Epub 2019 Feb 4.

INFANT PEDIATRIC POSTURE EVALUATION

(UPSIDE DOWN)

An infant is evaluated posturally by the Doctor of Chiropractic, holding the infant upside down, by their thighs (bilaterally) with the infant facing away from the DC and toward the parent.

Evaluation:

1. Look at infant's head for any:
   a. Head rotation;
   b. Head tilt;
   c. High shoulder;

2. Look at infant's hips:
   a. High hip;
   b. Rotation of hip

POSTURE CORRECTION IN CHILDREN (INFANT)

1. To analyze an infant's posture where the infant cannot hold their head in the upright position on their own:

a) Hold the infant upside down by the thighs, facing the parent. Hold the infant straight in front of you, and watch the direction the head is in. ***ie. Rotation of the head, lateral head tilt. Be aware of shoulder rotation***

b) Once you analyze the relative position of the head and shoulders, you will set up the child for instrument posture correction ***if the child cannot rotate fully in both directions***.

c) In this case *(right)* the infant's head is rotating to the left side, and has a left head tilt.

d) Facing the parent, lay the infant ride-side-down with the parent's arms held outward, and put the infant cervical spine over the wrist of the parent. Also, rotate the left arm and shoulder posterior.

e) <u>Correction:</u> Lightly superstress the infant head over the wrist of the parent, putting the head into the mirror image right head tilt. Gently, on the lowest setting (#1) stimulate the upper cervical area with the infant's head bent over the fulcrum of the parent arm.

f) Re-check posture with infant in upside down position.

POSTURE CORRECTION IN CHILDREN (INFANT)

II. As you see in the re-checked posture, the infant's head rotation is now rotating to the right side with no restriction or decrease in range of motion. Also, the level of the head and ears is balanced with no head tilt.

POSTURE CORRECTION IN CHILDREN (INFANT)

III. OBSERVATIONS:

PATIENT HAD AN IMMEDIATE BOWEL MOVEMENT AFTER LUMBAR SPINE WAS CHECKED, AND PARENT COMMENTED THAT THE BABY WAS EXTREMELY CONSTIPATED PRIOR TO COMING IN.

a) Received phone call at 7:00AM the following day, parent claiming that the infant slept through the night all night long for the very first time since birth.

b) Infants are people too! Don’t be afraid to do chiropractic care on an infant. The results sometimes can be amazing!

COMPONENTS OF STANDING POSTURAL CONTROL EVALUATED IN PEDIATRIC BALANCE MEASURES: A SCOPING REVIEW

DATE & JOURNAL: PUBLISHED: APRIL 21, 2017

Abstract

Objective:

To identify measures of standing balance validated in pediatric populations, and to determine the components of postural control captured in each tool.

Conclusions:

Assessing children's balance with valid and comprehensive measures is important for ensuring development of safe mobility and independence with functional tasks. Balance measures validated in pediatric populations to date do not comprehensively assess standing postural control and omit some key components for safe mobility and independence. Existing balance measures, that have been validated in adult populations and address some of the existing gaps in pediatric measures, warrant consideration for validation in children.

Sibley KM, Beauchamp MK, Van Ooteghem K, Paterson M, Wittmeier KD. Components of Standing Postural Control Evaluated in Pediatric Balance Measures: A Scoping Review. Arch Phys Med Rehabil. 2017 Oct;98(10):2066-2078.e4. doi: 10.1016/j.apmr.2017.02.032. Epub 2017 Apr 22. PMID: 28438514.

IV. INTRODUCTION TO DIVERSIFIED MYOFASCIAL RELEASE PROCEDURES

A. INSTRUMENT ASSISTED MUSCLE BALANCING

B. TRIGGER POINT THERAPY RESEARCH

C. FIBROTIC ADHESIONS, MYOSPASMS AND PIRIFORMIS WORK WITH INSTRUMENTS IN COMPETITIVE ATHLETES

INSTRUMENT ASSISTED MUSCLE BALANCING

(ADJUNCTIVE THERAPY TO WORK ON THE MUSCULATURE & POSTURE)

Massage is a great adjunctive therapy to use for preparatory readiness of muscle tissues prior to hands on treatment. Reminders:

- Only use on large muscle groups, NEVER over bony process or in the cervical spine. Not near hair or on bare skin. (Only over material or towel.)
- T1- L5 in the paraspinal muscle region, gluteal region and around shoulder musculature region.
- May go slightly deeper on extremely muscular athletes.
- ONLY use for 4 seconds on one spot, then move location.
- Entire treatment lasts between 1 and 2 minutes.
- Go Light & be careful.

INSTRUMENT ASSISTED MUSCLE BALANCING

(VIDEO DEMONSTRATION)

FIBROTIC ADHESIONS, MYOSPASMS & PIRIFORMIS WORK WITH INSTRUMENTS IN COMPETITIVE ATHLETES

MYOFASCIAL RELEASE

(DONE BY HANDS ONLY)

- During therapy, find the myofascial area that feels stiff and fixed instead of elastic and movable under light manual pressure.
- Manually apply pressure and stretching will help loosen up restricted movement, leading to reduced pain.
- Insurance will only cover HANDS ONLY myofascial therapy work. No instrument work will be covered.

EFFECT OF EXAMS PERIOD ON PREVALENCE OF MYOFASCIAL TRIGGER POINTS AND HEAD POSTURE IN UNDERGRADUATE STUDENTS: REPEATED MEASUREMENTS STUDY.

J Bodyw Mov Ther . 2017 Jan.

BACKGROUND:

Myofascial Trigger points (MTrPs) may be caused or aggravated by many factors, such as mental stress associated with exams and impaired posture.

CONCLUSIONS:

Physical therapy students show greater prevalence of MTrPs during exams. The authors recommend implementing preventative programs towards the examination period.

Kalichman L, Bulanov N, Friedman A. Effect of exams period on prevalence of Myofascial Trigger points and head posture in undergraduate students: Repeated measurements study. J Bodyw Mov Ther. 2017 Jan;21(1):11-18. doi: 10.1016/j.jbmt.2016.04.003. Epub 2016 Apr 7. PMID: 28167166.

MYOFASCIAL TRIGGER POINT THERAPY: WHAT IS IT?

- Myofascial pain results from muscle injury or repetitive strain.
- When stressed or injured, muscles from trigger points, like contracted knots that cause pain & tightness
- Common cause of pain
- When these points are pressed on, muscles fibers shorten, and cause referred pain

Reference: http://www.myofascialtherapy.org/myofascial-therapy/index.html

RESEARCH ON TRIGGER POINTS

- Patients evaluated in one pain management center were found to have a myofascial component to their pain in 95% of cases

  (Gerwin RD. A study of 96 subjects examined for both fibromyalgia and myofascial pain. J Musculoskeletal Pain 1995; 3 (suppl. 1):121-5.).

- There is increasing awareness that active myofascial trigger points often play a role in the symptoms of patients with tension headaches

  (Fernandez-de-Las-Penas C, onso-Blanco C, Cuadrado ML, Gerwin RD, Pareja JA. Myofascial trigger points and their relationship to headache clinical parameters in chronic tension-type headache. Headache 2006; 46(8):1264-72.).

- Low back pain, neck pain

  (Fernandez-de-Las-Penas C, onso-Blanco C, Miangolarra JC. Myofascial trigger points in subjects presenting with mechanical neck pain: A blinded, controlled study. Man Ther 2006;).

- Temporomandibular pain, forearm and hand pain, postural pain

  (Treaster D, Marras WS, Burr D, Sheedy JE, Hart D. Myofascial trigger point development from visual and postural stressors during computer work. J Electromyogr Kinesiol 2005;), pelvic/urogenital pain syndromes.

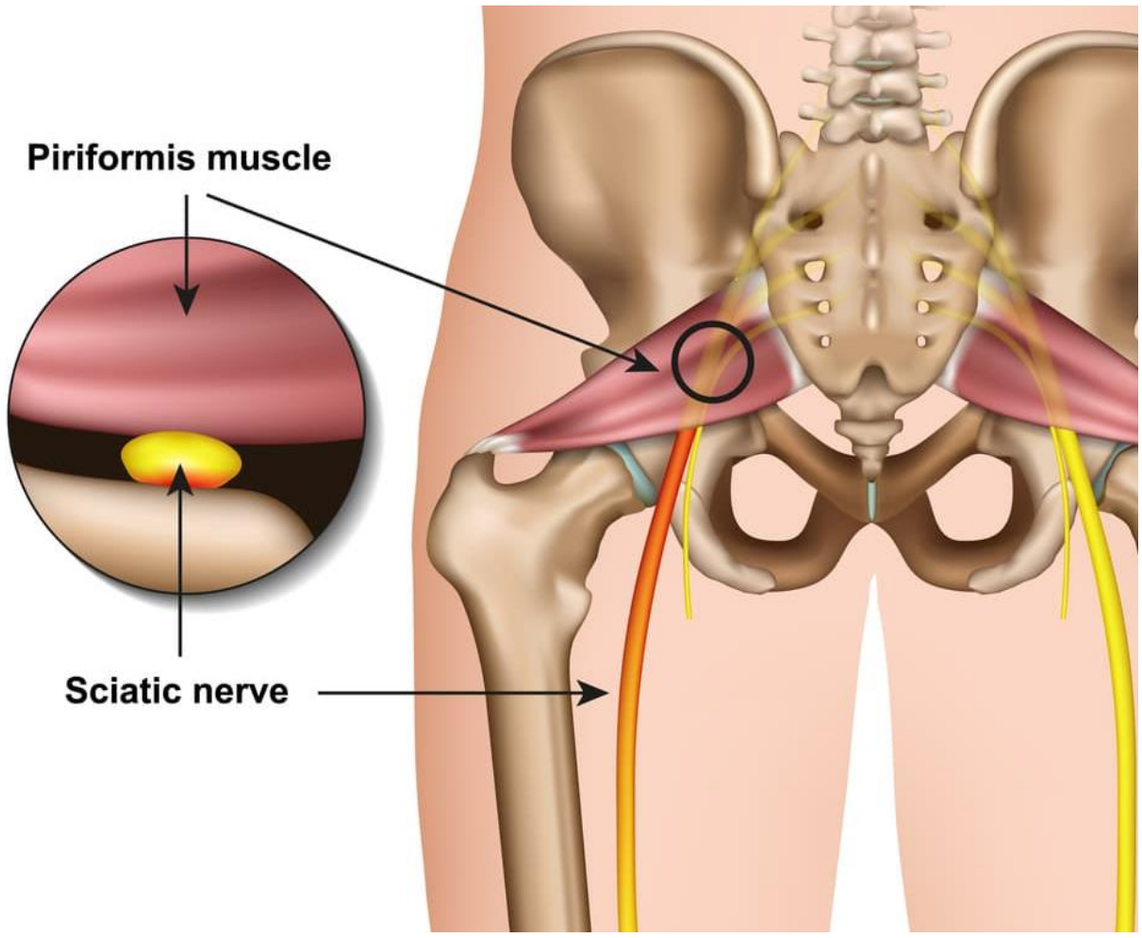
TREATMENT OF MYOFASCIAL TRIGGER POINTS

- Take a full medical and pain history
- Ergonomics of your work station and other regular activities.
- Assess and make suggestions to improve the quality of your sleep
- Make nutritional recommendations
- Choose an appropriate exercise/movement program
- Learn some self-treatment, self management and self care to assist you to treat your condition and your trigger points.

Reference: http://www.myofascialtherapy.org/myofascial-therapy/index.html

PIRIFORMIS SYNDROME

The piriformis syndrome is a condition in which the piriformis muscle irritates the sciatic nerve, causing pain in the buttocks, and referring pain along the entire course of the sciatic nerve.



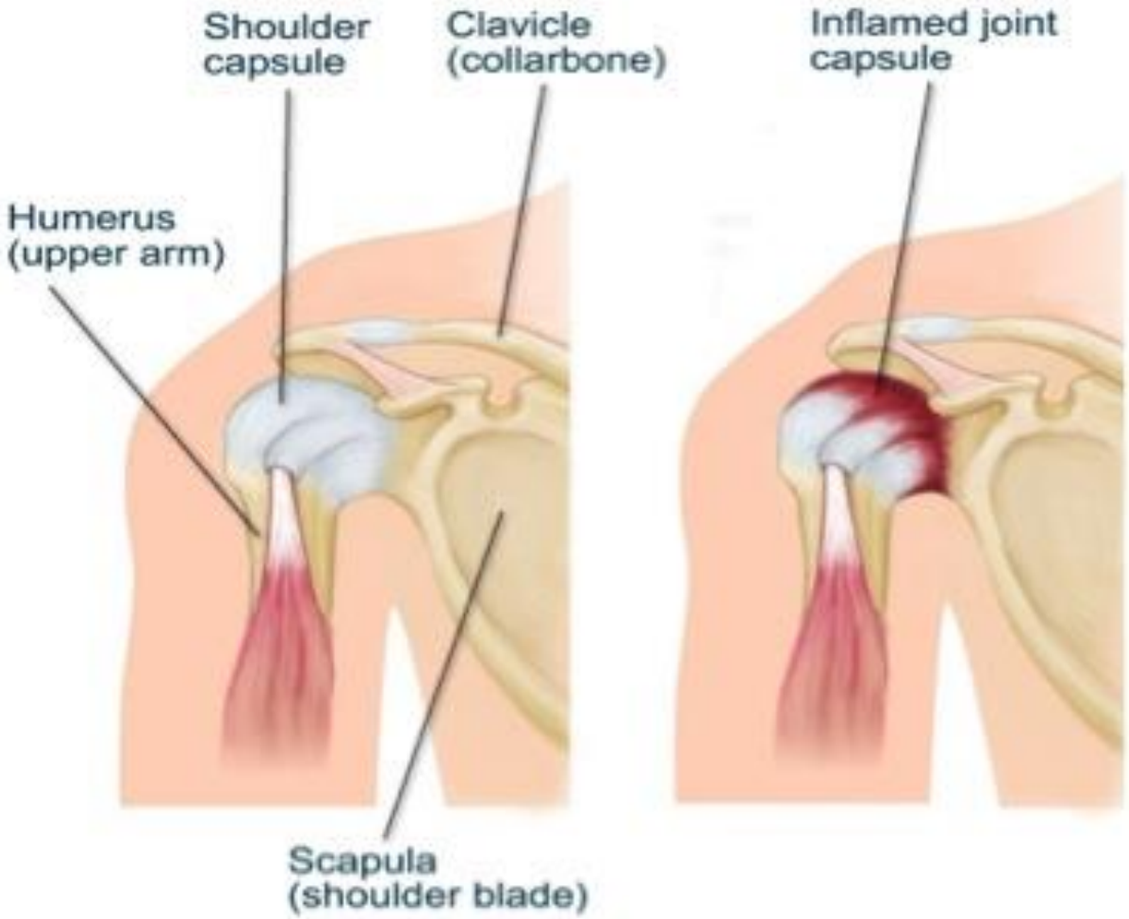
Patients usually complain of deep buttock pain which is made worse by sitting, stairs, or squats. The piriformis muscle assists in abduction and laterally rotating the thigh. Stretching the muscle often duplicates the pain.

Anatomically, the piriformis muscle lies deep to the gluteal muscles. It originates from the sacral spine and attaches to the greater trochanter. The sciatic nerve usually passes underneath the piriformis muscle, but in 15% of the population it travels through the muscle. Any acute or chronic injury with inflammation irritates the sciatic nerve . Piriformis syndrome is diagnosed by symptoms from the physical exam.

Once diagnosed, the treatment will include progressive piriformis stretching starting with four seconds of sustained stretch or up to 60sec. sustained stretch using your hands.

Frozen Shoulder Syndrome

Shoulder range of motion is locked up. Common in pitchers, quarterbacks, and sports that use a dominant arm.



Treatment:

- Dig Myofascial trigger points
- Put patient through full range of motion while working on specific trigger points
- May use electric massagers to loosen muscles prior to hands-on work

A CRITICAL OVERVIEW OF THE CURRENT MYOFASCIAL PAIN LITERATURE - OCTOBER 2017

J Bodyw Mov Ther . 2017 Oct.

Abstract

In this overview of the myofascial pain literature, we have included several original contributions ranging from a study by Bowen and colleagues of trigger points in horses to the introduction of a new clinical entity of "laryngeal muscle myofascial pain syndrome in dysphonic patients." Minerbi and colleagues described for the first time the referred pain patterns of the longus colli muscle, while Casale and associates studied the spinal modulatory action of dry needling or acupuncture stimulation. Many dry needling articles are included in this overview with several recent outcome studies. Slowly, there is increasing scientific support for using dry needling for a variety of conditions. Several researchers explored specific aspects of dry needling, such as needle placements, whether eliciting a local twitch response is desired, and the role of psychological factors in post-needling soreness. Contributions originated in Australia, Belgium, Brazil, Canada, China, Germany, Greece, India, Israel, Italy, Korea, Portugal, Spain, Switzerland, Turkey, the UK, and the USA.

Dommerholt J, Finnegan M, Hooks T, Chou LW. A critical overview of the current myofascial pain literature - October 2017. J Bodyw Mov Ther. 2017 Oct;21(4):902-913. doi: 10.1016/j.jbmt.2017.08.002. Epub 2017 Aug 18. PMID: 29037647.

EXAMPLES OF MY PREVIOUS PROFESSIONAL PATIENTS

Rams
84
LOS ANGELES RAMS
JULY 27
FAMILY AND FRIENDS TENT

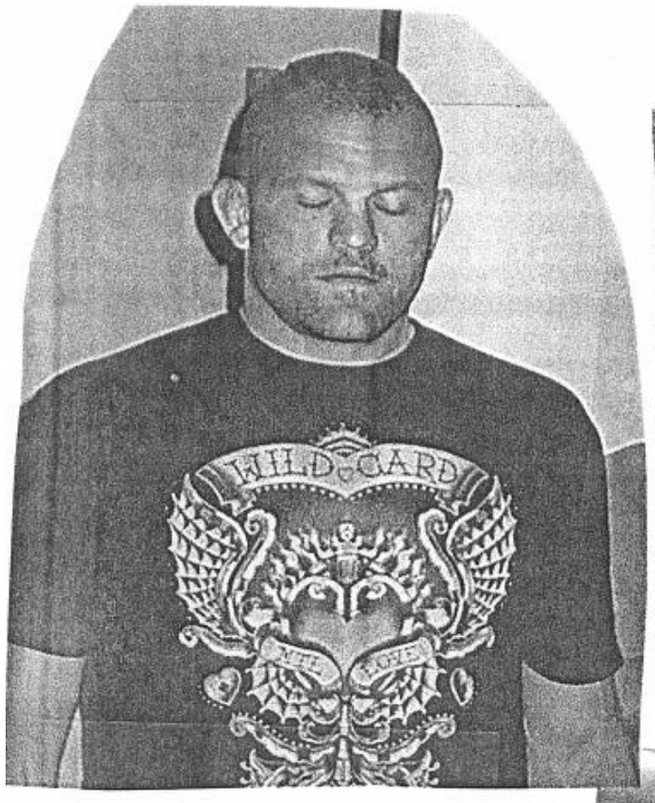
Rams
LOS ANGELES RAMS

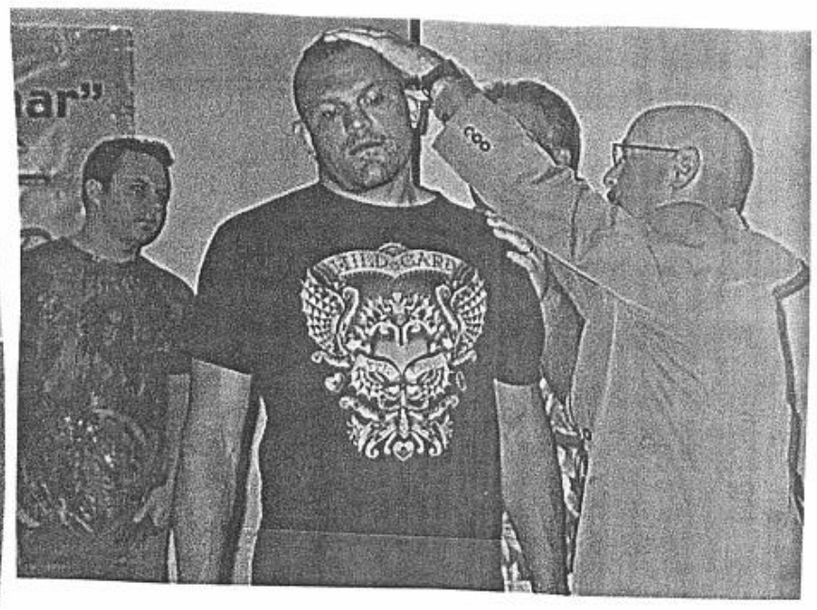
Rams
54
LOS ANGELES RAMS
JULY 23 2019

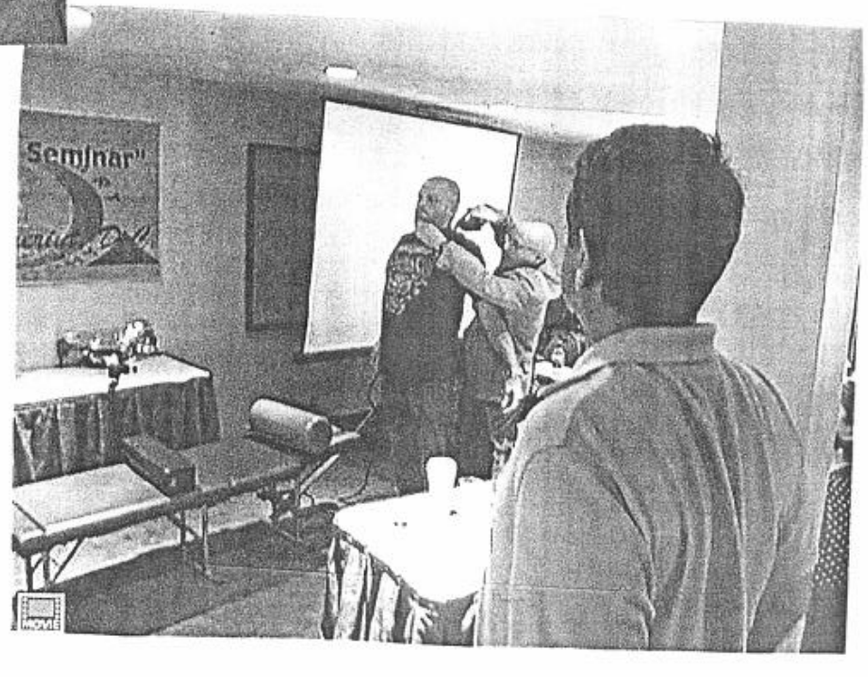
RAMS
Rams

LOS ANGELES RAMS
American Airlines

THE "ICEMAN" CHUCK LIDDELL GETS HIS POSTURE CORRECTED BY MARK CYMERINT D.C. IN AUGUST 2008.







HISTORY OF CHIROPRACTIC IN PROFESSIONAL SPORTS | 1920 - 2022

ROCKY MARCIANO, HEAVYWEIGHT BOXING CHAMPION, RELIES ON CHIROPRACTIC

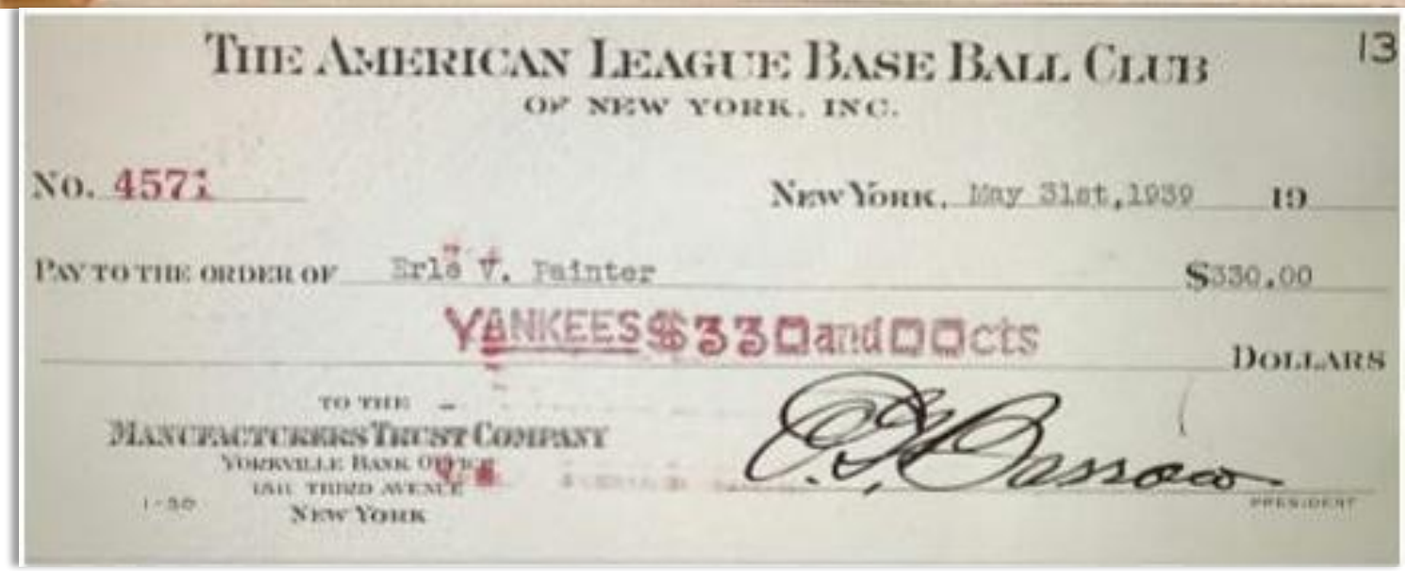
The obvious aspiration of every prizefighter is to attain the top spot in his particular class. To reach this goal, perfect physical fitness is a must. Immediate responsive reflexes, coordination, and stamina are the result of proper training, good habits, a well-balanced diet, and last but certainly not least, a spine free from nerve interference as the result of bony encroachment.

Rocky Marciano, world's heavyweight champ, exemplifies near perfect physical fitness. This, no doubt, is attributive to his willingness to take all measures necessary to keep him in the optimum of health. He does not smoke or drink and shuns devitalized and demineralized foods. The fact that the "Rock" receives his periodic adjustment indicates that he appreciates the efficacy of Chiropractic as one of the most important factors in the maintenance of health.

E. J. CREALESE, D.C.

From "Chiropractic Institute News of New York."

Heavyweight Champion Rocky Marciano and Chiropractor Edward J. Crealese of Brockton, Mass.



THE AMERICAN LEAGUE BASE BALL CLUB
OF NEW YORK, INC.

13

No. 4573 NEW YORK, May 31st, 1939 19

PAY TO THE ORDER OF Erle V. Painter $330.00

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YORKVILLE BANK OFFICE
1361 THIRD AVENUE
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Chiropractic Helps Babe Ruth and Other Yankees Keep in Perfect Physical Condition

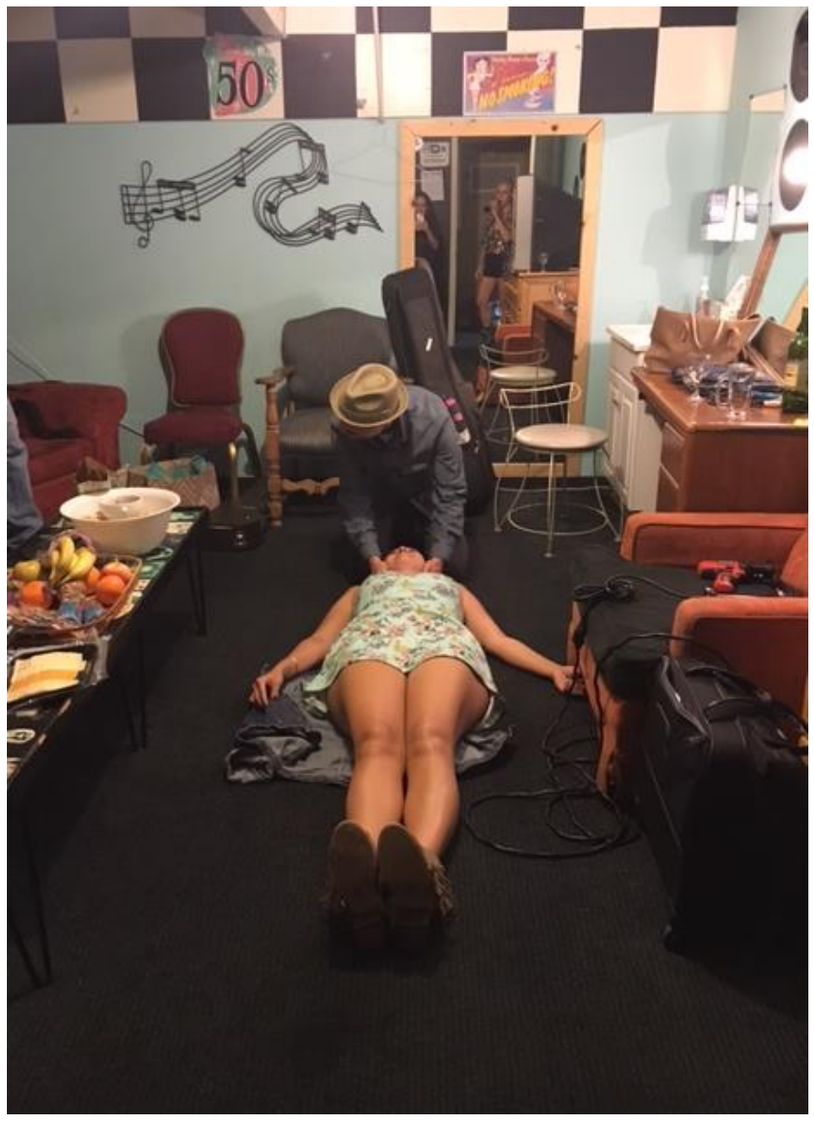
EVERY baseball fan will of course immediately recognize "Babe" Ruth in the picture reproduced above. But the gentleman at the extreme left, in the process of applying a bandage, is not so well known to the general public. In Chiropractic circles, however, he is quite as prominent as is the Bambino in the baseball world.

We present, Erle V. Painter, D. C., trainer of the New York Yankees, and the man largely responsible for the excellent physical condition of this fine team. By applying the principles of modern Chiropractic, in treating Ruth, Dr. Painter has amazed the wiseacres of the diamond, who years ago opined that "The Babe" was definitely "out of the running." The results he has accomplished with other members of the team have been almost equally remarkable.

Although he never clouts one over the fence, or aids in a sensational double play, Erle Painter is generally recognized as one of the most valuable men on the Yankee pay roll.

Dr. Painter is one of a growing group of enlightened Chiropractors who place much stress upon preventive counsel. As a general practitioner, he has devoted much time to teaching patients how to relax and rest; what to eat; how to walk correctly; the proper posture to maintain, and other essentials of health conservation. He conceives the Chiropractor's duty to embrace not only the correct adjustment of the spine, but also to educate the patient in maintaining a high standard of health. And this creed is heartily endorsed by Chiropractors of high standing throughout the country.

REGGAE/ POP ARTIST ANUHEA GETTING ADJUSTED



REGGAE/ POP ARTIST
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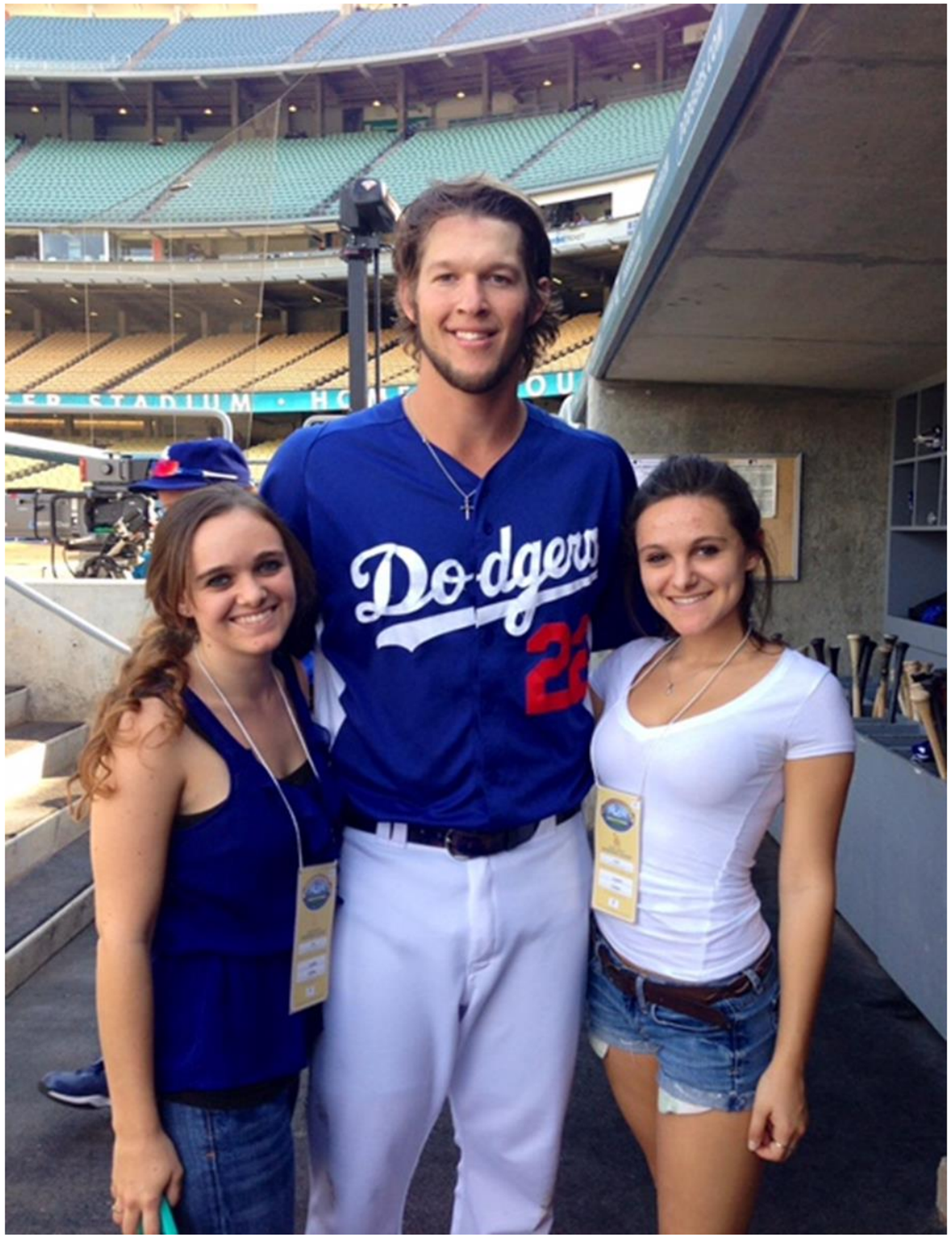
GETTING ADJUSTED

DODGERS GETTING ADJUSTED


Do-dgers

Dodgers
8
NEW ERA

THE SKELETAL SYSTEM

Dodgers

THE SKELETAL SYSTEM

PRO SURFERS GETTING ADJUSTED

PRO SURFERS GETTING ADJUSTED

CURRENT REVIEW OF NEUROLOGY LITERATURE INCLUDING: POSTURE, PROPRIOCEPTION, AND CONDITIONS COMMONLY TREATED BY CHIROPRACTIC METHODS

CONTRASTING ACTION AND POSTURE CODING WITH HIERARCHICAL DEEP NEURAL NETWORK MODELS OF PROPRIOCEPTION

Date & Journal: Elife. 2023 May 31

Abstract

Biological motor control is versatile, efficient, and depends on proprioceptive feedback. Muscles are flexible and undergo continuous changes, requiring distributed adaptive control mechanisms that continuously account for the body's state. The canonical role of proprioception is representing the body state. We hypothesize that the proprioceptive system could also be critical for high-level tasks such as action recognition. To test this theory, we pursued a task-driven modeling approach, which allowed us to isolate the study of proprioception. We generated a large synthetic dataset of human arm trajectories tracing characters of the Latin alphabet in 3D space, together with muscle activities obtained from a musculoskeletal model and model-based muscle spindle activity. Next, we compared two classes of tasks: trajectory decoding and action recognition, which allowed us to train hierarchical models to decode either the position and velocity of the end-effector of one's posture or the character (action) identity from the spindle firing patterns. We found that artificial neural networks could robustly solve both tasks, and the networks' units show tuning properties similar to neurons in the primate somatosensory cortex and the brainstem. Remarkably, we found uniformly distributed directional selective units only with the action-recognition-trained models and not the trajectory-decoding-trained models. This suggests that proprioceptive encoding is additionally associated with higher-level functions such as action recognition and therefore provides new, experimentally testable hypotheses of how proprioception aids in adaptive motor control.

Sandbrink KJ, Mamidanna P, Michaelis C, Bethge M, Mathis MW, Mathis A. Contrasting action and posture coding with hierarchical deep neural network models of proprioception. Elife. 2023 May 31;12:e81499. doi: 10.7554/eLife.81499. PMID: 37254843; PMCID: PMC

THE EFFECT OF FOOT POSTURE ON STATIC BALANCE, ANKLE AND KNEE PROPRIOCEPTION IN 18-TO-25 YEAR-OLD FEMALE STUDENT: A CROSS-SECTIONAL STUDY

Date & Journal: BMC Musculoskelet Disord. 2023 Jul 4

Abstract

Background & purpose: Afferent input from the sole affects postural stability. Cutaneous reflexes from the foot are important to posture and gait. Lower-limb afferents alone provide enough information to maintain upright stance and are critical in perceiving postural sway. Altered feedback from propreoceptive receptors alters gait and patterns of muscle activation. The position and posture of the foot and ankle may also play an important role in proprioceptive input. Therefore, the current research aims to compare static balance and ankle and knee proprioception in people with and without flexible flatfeet.

Result: Kruskal-Wallis test showed a significant difference between two groups of flat feet and normal feet in the variables of static balance and position sense of ankle plantarflexion, ankle dorsiflexion, and knee flexion ($p \leq 0.05$). A significant correlation was found between static balance and sense of ankle and knee position in the group with normal feet. The analysis of the regression line also showed that ankle and knee position sense could predict the static balance score in the regular foot group (ankle dorsiflexion position sense 17% ($R2 = 0.17$), ankle plantarflexion position sense 17% ($R2 = 0.17$) and knee flexion position sense 46% ($R2 = 0.46$) explain of changes in static balance).

Discussion & conclusion: Flexible flatfoot soles can cause loss of balance and sense of joint position; therefore, according to this preliminary study, clinicians must be aware and should take into account this possible deficit in the management of these patients.

Ghorbani M, Yaali R, Sadeghi H, Luczak T. The effect of foot posture on static balance, ankle and knee proprioception in 18-to-25-year-old female student: a cross-sectional study. BMC Musculoskelet Disord. 2023 Jul 4;24(1):547. doi: 10.1186/s12891-023-066

EFFECTS OF CHIROPRACTIC CARE ON STRENGTH, BALANCE, AND ENDURANCE IN ACTIVE-DUTY U.S. MILITARY PERSONNEL WITH LOW BACK PAIN: A RANDOMIZED CONTROLLED TRIAL

Date & Journal: J Altern Complement Med. 2020 Jul

Abstract

Objectives: To investigate whether chiropractic care influences strength, balance, and/or endurance in active-duty United States military personnel with low back pain (LBP). Participants were randomly allocated to 4 weeks of chiropractic care or to a wait-list control. Interventions: Chiropractic care consisted of spinal manipulation, education, advice, and reassurance.

Results: Participants had mean age of 30 years (18-40), 17% were female, 33% were non-white, and 86% reported chronic LBP. Mean maximum pulling strength in the chiropractic group increased by 5.08 kgs and decreased by 7.43 kgs in the wait-list group, with a statistically significant difference in mean change between groups ($p = 0.003$). Statistically significant differences in mean change between groups were also observed in trunk muscle endurance (13.9 sec, $p = 0.002$) and balance with eyes closed (0.47 sec, $p = 0.01$), but not in balance with eyes open (1.19 sec, $p = 0.43$). Differences in mean change between groups were statistically significant in favor of chiropractic for LBP-related disability, pain intensity and interference, and fear-avoidance behavior.

Conclusions: Active-duty military personnel receiving chiropractic care exhibited improved strength and endurance, as well as reduced LBP intensity and disability, compared with a wait-list control.

Vining R, Long CR, Minkalis A, Gudavalli MR, Xia T, Walter J, Coulter I, Goertz CM. Effects of Chiropractic Care on Strength, Balance, and Endurance in Active-Duty U.S. Military Personnel with Low Back Pain: A Randomized Controlled Trial. J Altern Complem

FACTORS ASSOCIATED WITH CLINICAL RESPONSES TO SPINAL MANIPULATION IN PATIENTS WITH NON-SPECIFIC THORACIC BACK PAIN: A PROSPECTIVE COHORT STUDY

Date & Journal: Front Pain Res (Lausanne) . 2022 Jan 6.

Abstract

Introduction: The management of musculoskeletal disorders is complex and requires a multidisciplinary approach. Manual therapies, such as spinal manipulative therapy (SMT), are often recommended as an adjunct treatment and appear to have demonstrable effects on pain and short-term disability in several spinal conditions. However, no definitive mechanism that can explain these effects has been identified. Identifying relevant prognostic factors is therefore recommended for people with back pain.

Objective: The main purpose of this study was to identify short-term candidate prognostic factors for clinically significant responses in pain, disability and global perceived change (GPC) following a spinal manipulation treatment in patients with non-specific thoracic back pain.

Results: 107 patients (62 females and 45 males) were recruited. Mean peak force averaged 450.8 N with a mean thrust duration of 134.9 ms. Post-intervention, comfort was associated with pain responder status ($p < 0.05$) and GPC responder status ($p < 0.05$), while expectation of disability improvement was associated with GPC responder status ($p < 0.05$). At follow-up, comfort and expectation of pain improvement were associated with responder GPC status ($p < 0.05$). No association was found between responder pain, disability or GPC status and biomechanical parameters of SMT at any time point.

Pasquier M, Young JJ, Lardon A, Descarreaux M. Factors Associated With Clinical Responses to Spinal Manipulation in Patients With Non-specific Thoracic Back Pain: A Prospective Cohort Study. Front Pain Res (Lausanne). 2022 Jan 6;2:742119. doi: 10.3389/fpa

DEVELOPMENT OF A MANNEQUIN LAB FOR CLINICAL TRAINING IN A CHIROPRACTIC PROGRAM

Date & Journal: J Chiropr Educ . 2022 Mar 31.

Abstract

Objective: Faced with COVID-19 safety protocols that severely limited the ability to conduct chiropractic technique instruction in the usual manner, our university invested the resources to develop a new mannequin lab for hands-on training, which would help supplement the loss of person-to-person contact.

Results: Mannequins were produced in 7 weeks, and space was built out for a special lab. Faculty members are developing classroom procedures to introduce the mannequin to students, phase in the skills from static and motion palpation, and practice thrust performance.

Conclusion: The production run was successful, and the resulting equipment, well-received by students and faculty. In addition to helping teach manual skills, the lab serves as a platform for educational research to test the efficacy of mannequin-based training protocols. With the pressure sensors on known locations along the spine, future research may be able to test the ability of students to identify and contact specific target locations for adjustive thrusts.

Owens EF, Dever LL, Hosek RS, Russell BS, Dc SS. Development of a mannequin lab for clinical training in a chiropractic program. J Chiropr Educ. 2022 Mar 31. doi: 10.7899/JCE-21-10. Epub ahead of print. PMID: 35394042.

VESTIBULAR DEFICITS IN DEAFNESS: CLINICAL PRESENTATION, ANIMAL MODELING, AND TREATMENT SOLUTIONS

Date & Journal: Front Neurol . 2022 Apr 4.

Abstract

The inner ear is responsible for both hearing and balance. These functions are dependent on the correct functioning of mechanosensitive hair cells, which convert sound- and motion-induced stimuli into electrical signals conveyed to the brain. During evolution of the inner ear, the major changes occurred in the hearing organ, whereas the structure of the vestibular organs remained constant in all vertebrates over the same period. Vestibular deficits are highly prevalent in humans, due to multiple intersecting causes: genetics, environmental factors, ototoxic drugs, infections and aging. Studies of deafness genes associated with balance deficits and their corresponding animal models have shed light on the development and function of these two sensory systems. Bilateral vestibular deficits often impair individual postural control, gaze stabilization, locomotion and spatial orientation. The resulting dizziness, vertigo, and/or falls (frequent in elderly populations) greatly affect patient quality of life. In the absence of treatment, prosthetic devices, such as vestibular implants, providing information about the direction, amplitude and velocity of body movements, are being developed and have given promising results in animal models and humans. Novel methods and techniques have led to major progress in gene therapies targeting the inner ear (gene supplementation and gene editing), 3D inner ear organoids and reprograming protocols for generating hair cell-like cells. These rapid advances in multiscale approaches covering basic research, clinical diagnostics and therapies are fostering interdisciplinary research to develop personalized treatments for vestibular disorders.

Maudoux A, Vitry S, El-Amraoui A. Vestibular Deficits in Deafness: Clinical Presentation, Animal Modeling, and Treatment Solutions. Front Neurol. 2022 Apr 4;13:816534. doi: 10.3389/fneur.2022.816534. PMID: 35444606; PMCID: PMC9013928.

NEUROANATOMY, EXTRAPYRAMIDAL SYSTEM

Date & Journal: StatPearls Publishing; 2022 Jan. 2021 Oct 30.

Excerpt

The extrapyramidal system (EPS) is an anatomical concept first developed by Johann Prus in 1898 when he discovered that the disturbance in pyramidal tracts failed to prevent the epileptic activities. Prus postulated that, apart from pyramidal tracts, there must be alternative pathways, called the "extrapyramidal tracts," that "delivered epileptic activity" from the cerebral cortex to the spinal cord. Clinically, the term “extrapyramidal” was thus adopted to distinguish between the clinical effects produced by damage involving the basal ganglia and those of damage to the classic “pyramidal” pathway. Despite this distinction, however, there are important anatomical and functional relationships between the two systems.

The EPS serves an essential function in maintaining posture and regulating involuntary motor functions. In particular, the EPS provides:

- Postural tone adjustment
- Preparation of predisposing tonic attitudes for involuntary movements
- Performing movements that make voluntary movements more natural and correct
- Control of automatic modifications of tone and movements
- Control of the reflexes that accompany the responses to affective and attentive situations (reactions)
- Control of the movements originally voluntary then become automatic through exercise and learning (e.g., in writing)
- Inhibition of involuntary movements (hyperkinesias), which are particularly evident in extrapyramidal diseases.

The EPS, therefore, controls the automatic activities but also influences voluntary motility through a tonic function. These regulation mechanisms involve the processing of centers located in multiple brain regions, such as parts of the cerebral cortex, the cerebellum, thalamus, reticular substance, and several basal ganglia. The term basal ganglia or basal nuclei is referred to as a group of subcortical nuclei. Among these nuclei, the caudate nucleus and the putamen nuclei, which together constitute the neostriatum, plus the substantia nigra (SN), red nucleus (RN), the subthalamic nucleus of Luys, and the black substance compose the nuclei of the EPS. From all these centers, numerous subcortical tracts, or the extrapyramidal tracts, stem out and terminate in the spinal cord. However, the majority of tracts travels through the basal ganglia. Thus, anatomically, the EPS can be defined as a set of nuclei and fiber tracts that received projections from the cerebral cortex and sent projections to the brainstem and spinal cord and, functionally, works as a complex motor-modulation system.

(Cont’d…)

Lee J, Muzio MR. Neuroanatomy, Extrapyramidal System. 2021 Oct 30. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022 Jan–. PMID: 32119429.

AGE-RELATED CHANGES TO VESTIBULAR HEAVE AND PITCH PERCEPTION AND ASSOCIATIONS WITH POSTURAL CONTROL

Date & Journal: Sci Rep . 2022 Apr 19.

Abstract

Falls are a common cause of injury in older adults (OAs), and age-related declines across the sensory systems are associated with increased falls risk. The vestibular system is particularly important for maintaining balance and supporting safe mobility, and aging has been associated with declines in vestibular end-organ functioning. However, few studies have examined potential age-related differences in vestibular perceptual sensitivities or their association with postural stability. Here we used an adaptive-staircase procedure to measure detection and discrimination thresholds in 19 healthy OAs and 18 healthy younger adults (YAs), by presenting participants with passive heave (linear up-and-down translations) and pitch (forward-backward tilt rotations) movements on a motion-platform in the dark. We also examined participants' postural stability under various standing-balance conditions. Associations among these postural measures and vestibular perceptual thresholds were further examined. Ultimately, OAs showed larger heave and pitch detection thresholds compared to YAs, and larger perceptual thresholds were associated with greater postural sway, but only in OAs. Overall, these results suggest that vestibular perceptual sensitivity declines with older age and that such declines are associated with poorer postural stability. Future studies could consider the potential applicability of these results in the development of screening tools for falls prevention in OAs.

Gabriel GA, Harris LR, Gnanasegaram JJ, Cushing SL, Gordon KA, Haycock BC, Campos JL. Age-related changes to vestibular heave and pitch perception and associations with postural control. Sci Rep. 2022 Apr 19;12(1):6426. doi: 10.1038/s41598-022-09807-4. PM

EFFECTS OF EXPERIMENTALLY INDUCED CERVICAL SPINE MOBILITY ALTERATION ON THE POSTURAL ORGANISATION OF GAIT INITIATION

Date & Journal: Sci Rep . 2022 Apr 11.

Abstract

Gait initiation (GI), the transient period between quiet standing and locomotion, is a functional task classically used in the literature to investigate postural control. This study aimed to investigate the influence of an experimentally-induced alteration of cervical spine mobility (CSM) on GI postural organisation. Fifteen healthy young adults initiated gait on a force-plate in (1) two test conditions, where participants wore a neck orthosis that passively simulated low and high levels of CSM alteration; (2) one control condition, where participants wore no orthosis; and (3) one placebo condition, where participants wore a cervical bandage that did not limit CSM. Centre-of-pressure and centre-of-mass kinematics were computed based on force-plate recordings according to Newton's second law. Main results showed that anticipatory postural adjustments amplitude (peak backward centre-of-pressure shift and forward centre-of-mass velocity at toe-off) and motor performance (step length and forward centre-of-mass velocity at foot-contact) were altered under the condition of high CSM restriction. These effects of CSM restriction may reflect the implementation of a more cautious strategy directed to attenuate head-in-space destabilisation and ease postural control. It follows that clinicians should be aware that the prescription of a rigid neck orthosis to posturo-deficient patients could exacerbate pre-existing GI deficits.

Delafontaine A, Vialleron T, Diakhaté DG, Fourcade P, Yiou E. Effects of experimentally induced cervical spine mobility alteration on the postural organisation of gait initiation. Sci Rep. 2022 Apr 11;12(1):6055. doi: 10.1038/s41598-022-10101-6. PMID: 354

PHOTOBIOMODULATION THERAPY: A NOVEL THERAPEUTIC APPROACH TO ALZHEIMER'S DISEASE MADE POSSIBLE BY THE EVIDENCE OF A BRAIN-GUT INTERCONNECTION

Date & Journal: J Integr Neurosci. 2024 Apr 30

Abstract

The evidence of brain-gut interconnections in Alzheimer's disease (AD) opens novel avenues for the treatment of a pathology for which no definitive treatment exists. Gut microbiota and bacterial translocation may produce peripheral inflammation and immune modulation, contributing to brain amyloidosis, neurodegeneration, and cognitive deficits in AD. The gut microbiota can be used as a potential therapeutic target in AD. In particular, photobiomodulation (PBM) can affect the interaction between the microbiota and the immune system, providing a potential explanation for its restorative properties in AD-associated dysbiosis. PBM is a safe, non-invasive, non-ionizing, and non-thermal therapy that uses red or near-infrared light to stimulate the cytochrome *c* oxidase (CCO, complex IV), the terminal enzyme of the mitochondrial electron transport chain, resulting in adenosine triphosphate synthesis. The association of the direct application of PBM to the head with an abscopal and a systemic treatment through simultaneous application to the abdomen provides an innovative therapeutic approach to AD by targeting various components of this highly complex pathology. As a hypothesis, PBM might have a significant role in the therapeutic options available for the treatment of AD.

Blivet G, Roman FJ, Lelouvier B, Ribière C, Touchon J. Photobiomodulation Therapy: A Novel Therapeutic Approach to Alzheimer's Disease Made Possible by the Evidence of a Brain-Gut Interconnection. J Integr Neurosci. 2024 Apr 30;23(5):92. doi: 10.31083/j.j

PHOTOBIOMODULATION THERAPY ON BRAIN: PIONEERING AN INNOVATIVE APPROACH TO REVOLUTIONIZE COGNITIVE DYNAMICS

Date & Journal: Cells. 2024 Jun 3

Abstract

Photobiomodulation (PBM) therapy on the brain employs red to near-infrared (NIR) light to treat various neurological and psychological disorders. The mechanism involves the activation of cytochrome c oxidase in the mitochondrial respiratory chain, thereby enhancing ATP synthesis. Additionally, light absorption by ion channels triggers the release of calcium ions, instigating the activation of transcription factors and subsequent gene expression. This cascade of events not only augments neuronal metabolic capacity but also orchestrates anti-oxidant, anti-inflammatory, and anti-apoptotic responses, fostering neurogenesis and synaptogenesis. It shows promise for treating conditions like dementia, stroke, brain trauma, Parkinson's disease, and depression, even enhancing cognitive functions in healthy individuals and eliciting growing interest within the medical community. However, delivering sufficient light to the brain through transcranial approaches poses a significant challenge due to its limited penetration into tissue, prompting an exploration of alternative delivery methods such as intracranial and intranasal approaches. This comprehensive review aims to explore the mechanisms through which PBM exerts its effects on the brain and provide a summary of notable preclinical investigations and clinical trials conducted on various brain disorders, highlighting PBM's potential as a therapeutic modality capable of effectively impeding disease progression within the organism-a task often elusive with conventional pharmacological interventions.

Nairuz T, Sangwoo-Cho, Lee JH. Photobiomodulation Therapy on Brain: Pioneering an Innovative Approach to Revolutionize Cognitive Dynamics. Cells. 2024 Jun 3;13(11):966. doi: 10.3390/cells13110966. PMID: 38891098; PMCID: PMC11171912.

LIGHT SOURCES FOR PHOTOBIOMODULATION: THE ROLE OF POWER AND BEAM CHARACTERIZATION IN TREATMENT ACCURACY AND RELIABILITY

Date & Journal: PLoS One . 2022 Mar 30.

Abstract

Purpose: Daily clinical use of therapeutic light sources can lead to changes in light emission stability with potentially significant consequences for usage in photomedicine treatment. The aim of this study was to evaluate the average and maximum power and to describe the beam diameter of different low-power laser photobiomodulation devices in clinical use in Brazil.

Results: The analyzed power varied between 2% to 134% of the values declared by the manufacturers. Differences in beam diameter of between 38% and 543% of the nominal values were also observed. It is also noteworthy that even between the same brand and model, differences in diameter were obtained. Finally, differences were observed in the power output after one and three minutes of sequential emission for 830 nm and 904 nm ($p < 0.05$), but not when comparing the difference between wavelengths in factor time.

Conclusion: There is a need for a shared effort on the part of laser manufacturers to improve standardization and consistency of laser output power and beam diameters. At the same time, medical laser operators should also consider development of standardized protocols for maintenance and monitoring equipment performance over time to correct for fluctuations that could ultimately impact on treatment outcomes.

Girasol CE, Braz GA, Bachmann L, Celli J, Guirro RRJ. Laser light sources for photobiomodulation: The role of power and beam characterization in treatment accuracy and reliability. PLoS One. 2022 Mar 30;17(3):e0266193. doi: 10.1371/journal.pone.0266193. P

EFFECT OF PHOTOBIOMODULATION THERAPY ON REDUCING ACUTE PAIN AND INFLAMMATION FOLLOWING SURGICAL REMOVAL OF IMPACTED MANDIBULAR THIRD MOLARS: A RANDOMIZED, SPLIT-MOUTH CLINICAL TRIAL

Date & Journal: Photobiomodul Photomed Laser Surg . 2022 Apr.

Abstract

Objective: This study aimed to compare the effects of photobiomodulation therapy (PBMT) on analgesic and inflammatory reduction with that of ibuprofen following surgical removal of impacted mandibular third molars (IMTMs).

Results: The study sample included 25 patients (average age of 22.88 years) with 50 bilateral symmetrical IMTMs. Pain level was highest at 2 h after surgery in both groups and gradually decreased over time ($p < 0.01$). Swelling and trismus at 48 h were higher than at 24 h ($p < 0.01$). Within the first 48 h postoperatively, pain level, swelling, and trismus were significantly lower in the PBMT group ($p < 0.05$). Postoperative sIgA was also significantly lower in the PBMT group ($p < 0.05$).

Conclusions: In short-term and specific conditions of this study, it was found that PBMT helped promote postoperative pain relief and anti-inflammation after surgical removal of IMTMs. The results suggested that there may be a link between a decrease in salivary sIgA levels and decrease in inflammatory processes after PBMT.

Le HT, Huynh NC, Nguyen-Ho QA, Nguyen TT, Le SH, Nguyen LT. Effect of Photobiomodulation Therapy on Reducing Acute Pain and Inflammation Following Surgical Removal of Impacted Mandibular Third Molars: A Randomized, Split-Mouth Clinical Trial. Photobiomodu

IMPROVEMENTS IN CERVICAL SPINAL CANAL DIAMETER AND NECK DISABILITY FOLLOWING CORRECTION OF CERVICAL LORDOSIS AND CERVICAL SPONDYLOLISTHESES USING CHIROPRACTIC BIOPHYSICS TECHNIQUE: A CASE SERIES.

DATE & JOURNAL: J RADIOL CASE REP . 2020 APR 30

Abstract

Cervical spondylolisthesis indicates instability of the spine and can lead to pain, radiculopathy, myelopathy and vertebral artery stenosis. Currently degenerative cervical spondylolisthesis is a wait-and-watch condition with no treatment guidelines. A literature review and discussion will be provided. 8 females presented with neck pain, disability, and history of motor vehicle collision. Radiographs revealed abnormal cervical alignment, spinal canal narrowing, and spondylolistheses. After 30 sessions of Chiropractic BioPhysics® care over 12 weeks, patients reported improved symptoms and disabilities. Radiographs revealed improvements in cervical alignment, spondylolistheses, and spinal canal diameter. Motor vehicle collision may cause instability and abnormal alignment of the cervical spine leading to cervical spondylolisthesis. Improving spinal alignment may be an effective treatment to reduce vertebral subluxation and cervical spondylolistheses and improve neck disability as a result of improved spinal alignment.

Fedorchuk C, Lightstone DF, Comer RD, Katz E, Wilcox J. Improvements in Cervical Spinal Canal Diameter and Neck Disability Following Correction of Cervical Lordosis and Cervical Spondylolistheses Using Chiropractic BioPhysics Technique: A Case Series. J Radiol Case Rep. 2020 Apr 30;14(4):21-37. doi: 10.3941/jrcr.v14i4.3890. PMID: 33082920; PMCID: PMC7536006.

BEST PRACTICES FOR CHIROPRACTIC MANAGEMENT OF PATIENTS WITH CHRONIC MUSCULOSKELETAL PAIN: A CLINICAL PRACTICE GUIDELINE.

DATE & JOURNAL: J ALTERN COMPLEMENT MED . 2020 OCT.

Abstract

Objective: To develop an evidence-based clinical practice guideline (CPG) through a broad-based consensus process on best practices for chiropractic management of patients with chronic musculoskeletal (MSK) pain.

Conclusions: These evidence-based recommendations for a variety of conservative treatment approaches to the management of common chronic MSK pain conditions may advance consistency of care, foster collaboration between provider groups, and thereby improve patient outcomes.

Hawk C, Whalen W, Farabaugh RJ, Daniels CJ, Minkalis AL, Taylor DN, Anderson D, Anderson K, Crivelli LS, Cark M, Barlow E, Paris D, Sarnat R, Weeks J. Best Practices for Chiropractic Management of Patients with Chronic Musculoskeletal Pain: A Clinical Practice Guideline. J Altern Complement Med. 2020 Oct;26(10):884-901. doi: 10.1089/acm.2020.0181. Epub 2020 Jul 30. PMID: 32749874; PMCID: PMC7578188.

EFFECT OF CERVICAL MANIPULATION ON VERTEBRAL ARTERY AND CEREBRAL HAEMODYNAMICS IN PATIENTS WITH CHRONIC NECK PAIN: A CROSSOVER RANDOMISED CONTROLLED TRIAL.

DATE & JOURNAL: BMJ OPEN. 2019 MAY 28

- Objective: It is hypothesised that cervical manipulation may increase the risk of cerebrovascular accidents. We aimed to determine whether cervical spine manipulation is associated with changes in vertebral artery and cerebrovascular haemodynamics measured with MRI compared with neutral neck position and maximum neck rotation in patients with chronic neck pain.

- Conclusion: our results are in accordance with previous work, which has shown a decrease in blood flow and velocity in the contralateral vertebral artery with head rotation. This may explain why we also observed a decrease in blood velocity with manipulation because it involves neck rotation. Our work is the first to show that cervical manipulation does not result in brain perfusion changes compared with a neutral neck position or maximal neck rotation. The changes observed were found to not be clinically meaningful and suggests that cervical manipulation may not increase the risk of cerebrovascular events through a haemodynamic mechanism.

Moser N, Mior S, Noseworthy M, Côté P, Wells G, Behr M, Triano J. Effect of cervical manipulation on vertebral artery and cerebral haemodynamics in patients with chronic neck pain: a crossover randomised controlled trial. BMJ Open. 2019 May 28;9(5):e025219. doi: 10.1136/bmjopen-2018-025219. PMID: 31142519; PMCID: PMC6549698.

THE IMPACT OF SPINAL MANIPULATION ON MIGRAINE PAIN AND DISABILITY: A SYSTEMATIC REVIEW AND META-ANALYSIS.

DATE & JOURNAL: HEADACHE. 2019 APR

BACKGROUND:
Several small studies have suggested that spinal manipulation may be an effective treatment for reducing migraine pain and disability. We performed a systematic review and meta-analysis of published randomized clinical trials (RCTs) to evaluate the evidence regarding spinal manipulation as an alternative or integrative therapy in reducing migraine pain and disability.

CONCLUSIONS:
Spinal manipulation may be an effective therapeutic technique to reduce migraine days and pain/intensity. However, given the limitations to studies included in this meta-analysis, we consider these results to be preliminary. Methodologically rigorous, large-scale RCTs are warranted to better inform the evidence base for spinal manipulation as a treatment for migraine.

Rist PM, Hernandez A, Bernstein C, Kowalski M, Osypiuk K, Vining R, Long CR, Goertz C, Song R, Wayne PM. The Impact of Spinal Manipulation on Migraine Pain and Disability: A Systematic Review and Meta-Analysis. Headache. 2019 Apr;59(4):532-542. doi: 10.1111/head.13501. Epub 2019 Mar 14. PMID: 30973196; PMCID: PMC6461372.

MANIPULATION AND MOBILIZATION FOR TREATING CHRONIC NONSPECIFIC NECK PAIN: A SYSTEMATIC REVIEW AND META-ANALYSIS FOR AN APPROPRIATENESS PANEL.

DATE & JOURNAL: PAIN PHYSICIAN. 2019 MAR

BACKGROUND:
Mobilization and manipulation therapies are widely used by patients with chronic nonspecific neck pain; however, questions remain around efficacy, dosing, and safety, as well as how these approaches compare to other therapies.

OBJECTIVES:
Based on published trials, to determine the efficacy, effectiveness, and safety of various mobilization and manipulation therapies for treatment of chronic nonspecific neck pain.

CONCLUSIONS:
Studies published since January 2000 provide low-moderate quality evidence that various types of manipulation and/or mobilization will reduce pain and improve function for chronic nonspecific neck pain compared to other interventions. It appears that multimodal approaches, in which multiple treatment approaches are integrated, might have the greatest potential impact. The studies comparing to no treatment or sham were mostly testing the effect of a single dose, which may or may not be helpful to inform practice. According to the published trials reviewed, manipulation and mobilization appear safe. However, given the low rate of serious adverse events, other types of studies with much larger sample sizes would be required to fully describe the safety of manipulation and/or mobilization for nonspecific chronic neck pain.

Coulter ID, Crawford C, Vernon H, Hurwitz EL, Khorsan R, Booth MS, Herman PM. Manipulation and Mobilization for Treating Chronic Nonspecific Neck Pain: A Systematic Review and Meta-Analysis for an Appropriateness Panel. Pain Physician. 2019 Mar;22(2):E55-E70. PMID: 30921975; PMCID: PMC6800035.

TREATING 'SLOUCHY' (HYPERKYPHOSIS) POSTURE WITH CHIROPRACTIC BIOPHYSICS®: A CASE REPORT UTILIZING A MULTIMODAL MIRROR IMAGE® REHABILITATION PROGRAM.

DATE & JOURNAL: J PHYS THER SCI. 2017 AUG

- Purpose: To present a case of the non-surgical reduction of 'slouchy' hyperkyphosis posture utilizing the multimodal Chiropractic BioPhysics® rehabilitation program emphasizing the mirror image® concept.

- Results: After 6-months of treatment the patient displayed a total correction of the posterior thoracic translation with a significant reduction in thoracic hyperkyphosis. The dramatic correction of her overall posture and spine alignment corresponded to the significant relief of neck and back pains, headaches and improvement of various other health issues as demonstrated by self-report and SF-36.

- Conclusion: Poor postures corresponding to poor health can be changed for the better with multimodal rehabilitation programs that are now showing consistent postural improvements corresponding with improvements in various health conditions. We suggest that the postural correction of those with various pain symptoms be considered as a first line non-pharmalogical, non-surgical rehabilitation approach for those presenting with poor posture.

Fortner MO, Oakley PA, Harrison DE. Treating 'slouchy' (hyperkyphosis) posture with chiropractic biophysics®: a case report utilizing a multimodal mirror image® rehabilitation program. J Phys Ther Sci. 2017 Aug;29(8):1475-1480. doi: 10.1589/jpts.29.1475.

CORRECTION OF PSEUDOSCOLIOSIS (LATERAL THORACIC TRANSLATION POSTURE) FOR THE TREATMENT OF LOW BACK PAIN: A CBP® CASE REPORT.

DATE & JOURNAL: J PHYS THER SCI. 2018 SEP

- [Purpose] To present the case of a total reduction of pseudoscoliosis spinal deformity in an adult female suffering from recurrent back pains.

- [Results] The patient achieved a complete reduction of the lateral thoracic translation posture (pseudoscoliosis) as indicated on a post-treatment radiograph after 36 total treatments. Most orthopedic tests became normalized and the patients back pains were significantly improved after the correction of posture, but only slight improvements after the initial 12 sessions of manipulative therapy only.

- [Conclusion] Pseudoscoliosis is structurally reducible by use of CBP® mirror image® lateral translation traction methods and exercises and led to the resolution of back pains in this case. The diagnosis of pseudoscoliosis as opposed to true scoliosis is very important and likely underdiagnosed in common practice. Upright radiographic imaging is essential to differentiate these two spinal disorders and offers no harm to the patient. Comprehensive assessment including routine use of x-ray is recommended to differentiate between spinal disorders.

Henshaw M, Oakley PA, Harrison DE. Correction of pseudoscoliosis (lateral thoracic translation posture) for the treatment of low back pain: a CBP® case report. J Phys Ther Sci. 2018 Sep;30(9):1202-1205. doi: 10.1589/jpts.30.1202. Epub 2018 Sep 4. PMID: 30

ALLEVIATION OF PAIN AND DISABILITY IN A POST-SURGICAL C4-C7 TOTAL FUSION PATIENT AFTER REDUCING A LATERAL HEAD TRANSLATION (SIDE SHIFT) POSTURE: A CBP® CASE REPORT WITH A 14 YEAR FOLLOW-UP.

DATE & JOURNAL: J PHYS THER SCI. 2018 JUL

Background:
This case describes the long-term successful outcome in a chronic neck pain patient given Chiropractic Biophysics® treatment 14 years previously, and following surgical fusion of C4-C7 as performed 6.5 years prior to initial presentation.

Conclusion:
This case illustrates what has previously been suggested in the literature, that lateral head translation postures can be overlooked and undiagnosed and these postures may play a significant role in the production of neck pain, headaches, and related disability.

Oakley PA, Harrison DE. Alleviation of pain and disability in a post-surgical C4-C7 total fusion patient after reducing a lateral head translation (side shift) posture: a CBP® case report with a 14 year follow-up. J Phys Ther Sci. 2018 Jul;30(7):952-957. doi: 10.1589/jpts.30.952. Epub 2018 Jul 3. PMID: 30034105; PMCID: PMC6047960.

Thank you, Docs!

A brief evaluation survey will be emailed to you in the coming days.
Please fill out the evaluation ASAP & press “submit”.

Hope you enjoyed the seminar and I thank you for your continued support!
We really appreciate all of you!

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