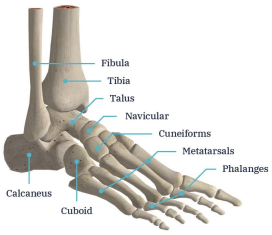
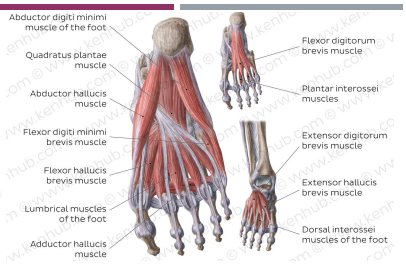
THE FOOT: THE NATURAL HISTORY OF AN APPENDAGE

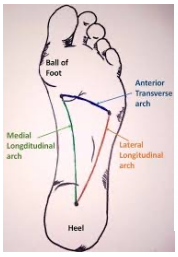
DR. KENNETH PROEFROCK

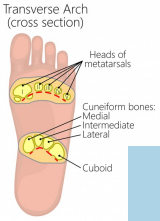


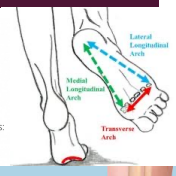


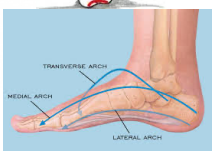
The human foot contains 26 bones, 33 joints, and over 100 muscles, tendons, and ligaments, all wrapped together in layers of fascia and working with a coordinated effort to support and move the body--allowing for a range of movements that include the delicate balance required for tiptoeing to the powerful thrust needed for sprinting

THE ARCHES OF THE FOOT REPRESENT AN ARCHITECTURAL MARVEL, ABSORBING AND DISTRIBUTING THE IMPACT OF EACH STEP, REDUCING STRESS ON THE REST OF THE BODY AND MAINTAINING OVERALL STABILITY AND BALANCE

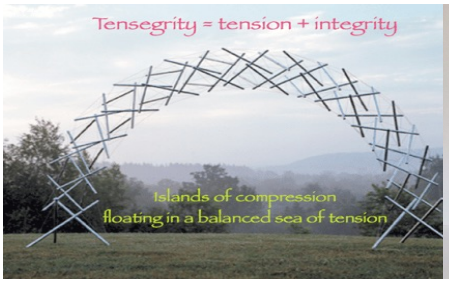


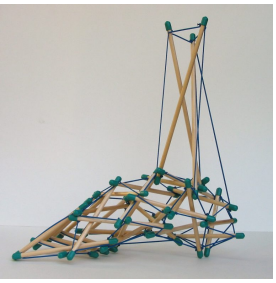




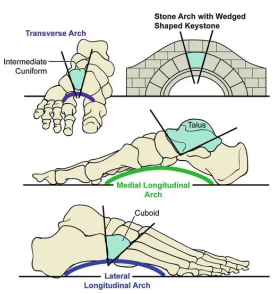


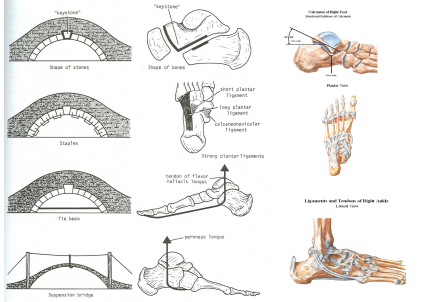
Biotensegrity: muscles, bones, fascia, ligaments and tendons are made strong by the union of tensioned and compressed parts.



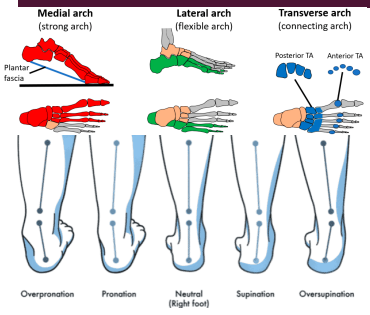


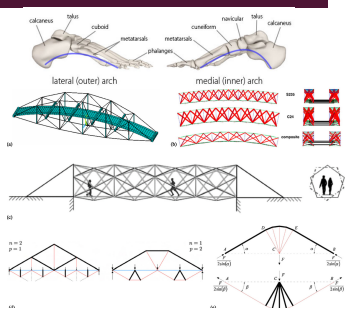
THE BODY IS NOT A COMPRESSED ARCHITECTURE OF BONES STACKED ON TOP OF ONE ANOTHER-IT IS A SUSPENSION—BEGINNING WITH THE SUSPENDED ARCHES OF THE FEET

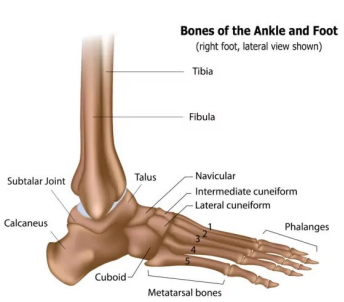


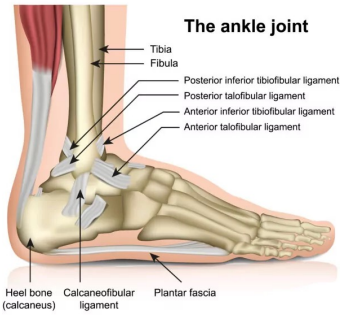


THE ARCHES DETERMINE BALANCE AND POSTURE PROPRIOCEPTION BEGINS IN THE FEET

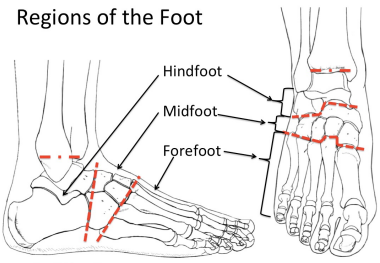


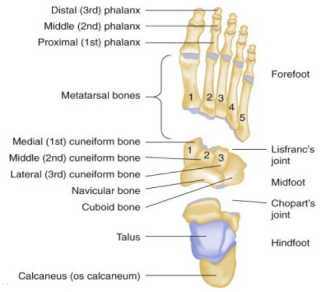




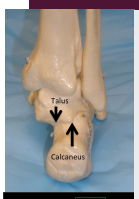


THE FOOT IS DIVIDED INTO THREE ANATOMICAL REGIONS





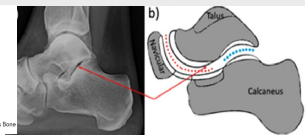
THE ANATOMICAL HINDFOOT



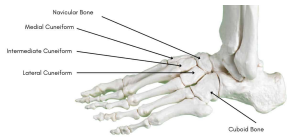
The hindfoot consists of the Calcaneus and the Talus bones, whose articulation allows for inversion and eversion of the foot and ankle.

The **Talus** is one of the few bones in the body not connected by ligaments to other bones, and almost its entire surface is covered by cartilage. Its primary function is to transfer force through the heel as it forms the lower part of the ankle joint.

The **Calcaneus bone** is also known as the heel bone and serves as a connection point for the achilles tendon and the plantar fascia. It is a very strong weight-bearing bone and takes a high-force incident like a fall or car crash to break.



THE ANATOMICAL MID-FOOT



The Midfoot consists of 5 bones: the Navicular, Cuboid, Medial, Intermediate, and Lateral Cuneiforms. The bones of the midfoot help to form the arch of the foot, and their function is to transmit and reduce forces while allowing the foot to accommodate uneven ground surfaces.

The Navicular bone is irregular in shape and referred to as the keystone of the medial arch of the foot. Due to the location of the Navicular at the peak of the arch of the foot, it is susceptible to stress fractures and can be poor at healing due to its limited blood supply.

The Cuboid bone is roughly cubical in structure hence its name, and it is located on the outside of the midfoot. It helps to provide stability to the midfoot.

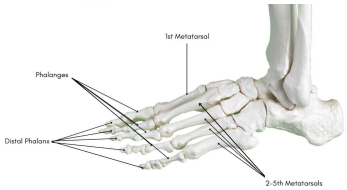
The Cuneiform bones are 3 wedge-shaped bones that form the transverse arch of the foot. They have numerous muscular attachments, such as the Tibialis Anterior, Peroneal Longus, Posterior Tibial Tendon, and Flexor Hallucis Brevis.

THE ANATOMICAL FOREFOOT

The forefoot consists of 19 bones; 5 metatarsal bones and 14 phalanges. The big toe has 2 phalanges bones, while the remaining four have 3 phalanges each.

The 1st metatarsal is the shortest and thickest of the metatarsals, and it is designed to take up to 40% of your body weight in standing, which rises to 70% when walking.
The 2nd metatarsal is often the longest, with the 3-5th metatarsals becoming shorter than the other, but this varies depending on foot type, and they assist with balance when walking and running.

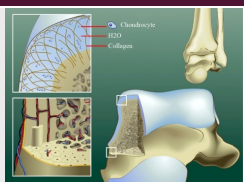
The Phalanges provide attachment points to allow the toes to bend and extend while also assisting with balance.

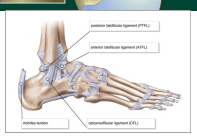


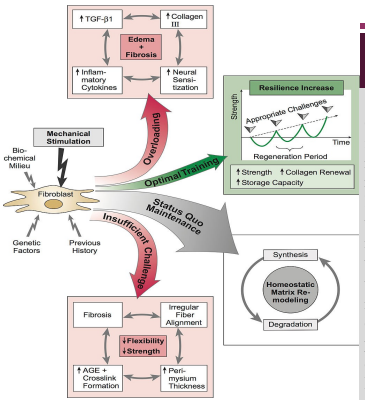
HARD CONNECTIVE TISSUES OF THE FEET

Cartilage: Shiny and smooth, cartilage allows smooth movement where two bones come in contact with each other, this is the interface that is most subject to arthritic changes. It is often the compression of cartilage that leads to increased play in the joint and then increased deterioration of the cartilage with spurring of bones.

Ligaments: Ligaments are fascial structures that are strong rope-like tissues that connect bones to other bones, stabilize tendon positions and provide stability to the joints. The plantar fascia is the longest ligamentous structure in the foot, originating at the calcaneus and continuing along the bottom surface of the foot to the forefoot. It is responsible for the elasticity of the arches of the foot and provides shock absorption. Plantar fasciitis happens when repetitive micro tears occur in the plantar fascia from overuse. Ankle sprains, the most commonly reported injury to the foot and ankle area, involve ligament strain, and usually occur to the talo-fibular ligament and the calcaneo-fibular ligament.







Ligament Remodeling

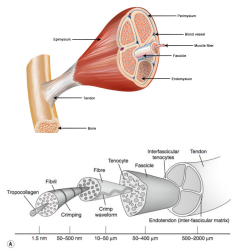
"Ligaments, or any soft tissue, when put under even a moderate degree of tension, if that tension is unremitting, will elongate by the addition of new material; on the contrary, when ligaments, or rather soft tissues, remain uninterruptedly in a loose or lax state, they will gradually shorten, as the effete material is removed, until they come to maintain the same relation to the bony structures with which they are united that they did before their shortening. Nature never wastes her time and material in maintaining a muscle or ligament at its original length when the distance between their points of origin and insertion is for any considerable time, without interruption, shortened" Henry Gassett Davis 1867

SOFT CONNECTIVE TISSUES OF THE FOOT

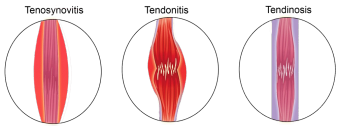
Muscles: Muscles are fibrous tissue capable of contracting to cause body movement. There are 20 muscles in the foot and these are classified as intrinsic or extrinsic. The intrinsic muscles are those located in the foot and are responsible for toe movement. The extrinsic muscles are located outside the foot in the lower leg. The gastrocnemius or calf muscle is the largest of these and assists with movement of the foot. Muscle strains occur usually from overuse of the muscle in which the muscle is stretched without being properly warmed up.

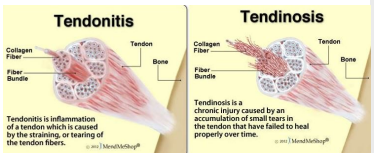
Tendons: Tendons are soft tissue that connects muscles to bones to provide support. The Achilles tendon, also called the heel cord, is the largest and strongest tendon in the body. Located on the back of the lower leg it wraps around the calcaneus.

Bursae: Bursae are small fluid filled sacs that decrease friction between tendons and bone or skin. Bursae contain special cells called synovial cells that secrete a lubricating fluid.



TENDONS/TENDINITIS/TENDINOPATHY





Tendons are the fascial structures that connect muscle to bone, generally a pully system with the tendon sliding through a lubricated synovial sheath.

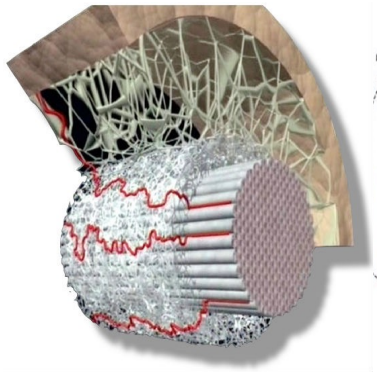
Tendinitis involves a strain and swelling of the tendinous structure, tendinopathy happens when the inflamed tendon 'sticks' or heals to the wall of the sheath. Tenosynovitis is an inflammation of the synovial sheath.

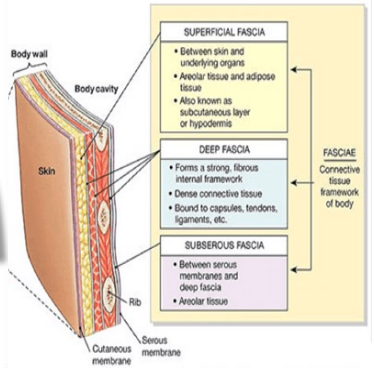
A condition that is very amenable to topical application of antispasmodic agents, stretching therapy, and internal use of inflammation resolving botanicals like Alpinia, Zingiber, Lobelia.

FASCIA

Fascia is, literally, the biological fabric that holds our body together, a three-dimensional spider web of fibrous, gluey, and wet proteins that acts like a bracing and organizing scaffold for the physical form.
Understanding fascia is essential to understanding the dance between static and dynamic bodily processes, between the experience of pain and that of comfort, it is crucial to physical performance, central to recovery from injury and disability, and an ever-present participant in our daily quality of life.

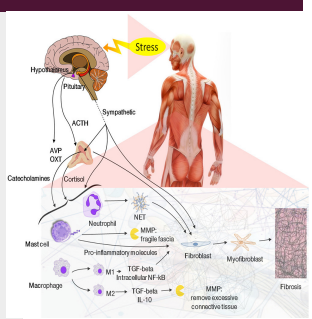
Fascia is one single, vastly interconnected, biomechanical regulatory system with millions of tiny nerves moving in and out of adjacent sheets of fascial material, into and out of contained compartments of fluid within muscles, organs and skin. Not only does it represent a structurally critical component of the physical form, it also acts to transmit information and resources throughout the system, often faster and more deliberately than other bodily communication systems.



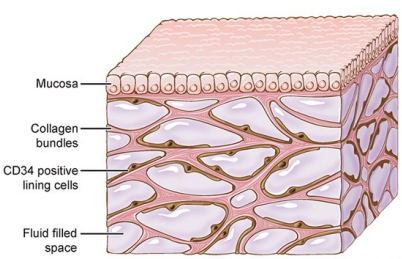


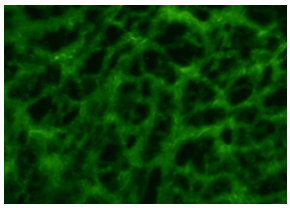
Fascia connects us to every other aspect of ourselves

- The fascia is a major contributor of both sensory and proprioception.
  - Matrix of communication between all cells , organs and whole body systems.
  - Provide a tensile support for muscles important to generate force.
- Embryology helps explain how all the fascial system connects all major systems including the nervous system.
- The cells in early in development differentiate into 3 germ layers.
  - Ectoderm: nervous system and the skin.
  - Mesoderm: bones, muscles , fascial tissue and CV system
  - Endoderm: various internal organs and endothelial linings



IS THE INTERSTITIUM REALLY A NEW ORGAN?
A 2018 STUDY CONFIRMED THAT THE SPACES BETWEEN CELLS ARE FLUID-FILLED
BENIAS ET AL., SCIENTIFIC REPORTS,

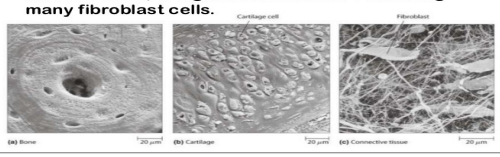




Frozen human bile duct tissue imaged by fluorescence microscopy demonstrates the net-like pattern in the connective tissue of the interstitium.

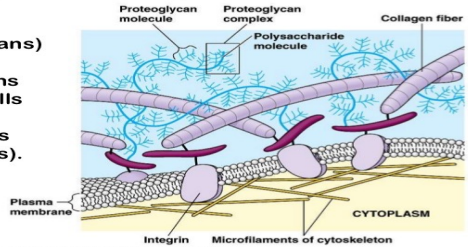
EXTRACELLULAR MATRIX (ECM): A COMPLEX MIXTURE OF SECRETED MACROMOLECULES THAT LUBRICATE TISSUES

- Many animal cells are intrinsically linked to other cells and to the extracellular matrix (ECM).
- Cell surface molecules bind to other cells, or to other components of the ECM. They also play a role in mutual recognition of similar cell types.
- Bone and cartilage are mostly ECM plus a very few cells. Connective tissue that surrounds glands and blood vessels, is a gelatinous matrix containing many fibroblast cells.



THE EXTRACELLULAR MATRIX CONTAINS THREE CLASSES OF MOLECULES:

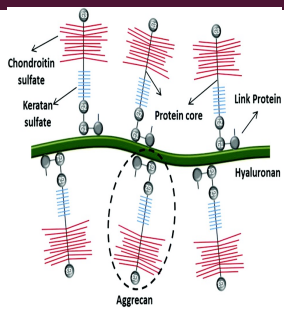
- structural proteins (collagens and elastins)
- protein-polysaccharide complexes to embed the structural proteins (proteoglycans)
- adhesive glycoproteins to attach cells to matrix (fibronectins and laminins).



GLYCOSAMINOGLYCANS (GAGS)

"unbranched polysaccharide chains composed of repeating disaccharide units"
- usually sulfated
- highly negatively charged
- forms a gel that attracts Na+, water and swells
- Can occupy a lot of space/mass
- resists compression
- synthesized predominantly in the Golgi apparatus

– Types of glycosaminoglycans:
- hyaluron (hyaluronic acid)
- chondroitin sulfate and dermatan sulfate
- heparan sulfate and heparin
- keratan sulfate



Hyaluronic acid: An extremely common polymer found in nature

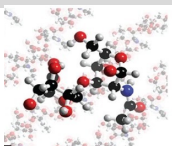
The largest GAG, makes up an enormous proportion of the basal lamina of mammalian tissues.

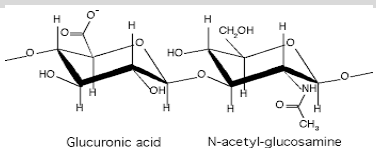
A linear polysaccharide consisting of D-glucuronic acid and N-acetyl-D-glucosamine linked by Beta(1,3) and Beta(1,4) glycosidic linkages.

Distinguished from the other glycosaminoglycans as it is free from covalent links to protein and sulphate groups.

Has been demonstrated to be important to tissue functions such as tissue hydration, lubrication, solute transport, cell migration, cell function and differentiation.

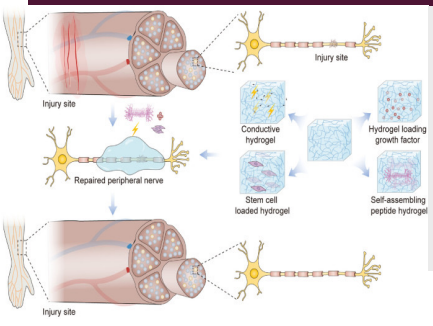
Dietary sources of hyaluronic acid include bone broth/bone ends and mushrooms.





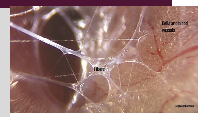
Glucuronic acid N-acetyl-glucosamine

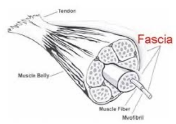
Hyaluronic Acid Hydrogel



Provides a matrix for the migration of remodeling cells
Consider the addition of PRP, peptides—TB4, BPC, Neurotrophic growth factors, procaine
Ultrasound guided injection directly around the site of repair
5-7.5 mg/ml concentration

THIXOTROPY TREATMENT

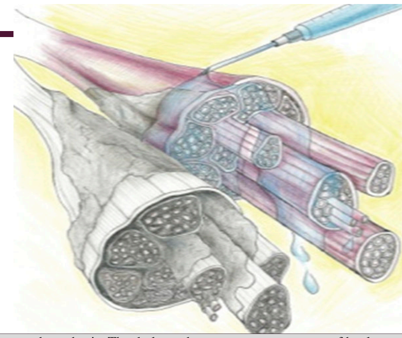




Ida Rolf proposed the theory that connective tissue is a colloid substance in which the ground substance can be influenced by the application of energy (heat or mechanical pressure) to change its aggregate form from a more dense "gel" state to a more fluid "sol" state.

Typical examples of this are common gelatin or butter, which get softer by heating or application of mechanical pressure. This gel-to-sol transformation, also called thixotropy (Juhan 1987), has in fact been demonstrated in connective tissues as a result of the application of mechanical stress as well as temperature differential therapy (alternating hot and cold).

Rigor mortis vs deep sleep



The hyaluronan hypothesis. The dark patches represent aggregates of hyaluronan. Injection of the enzyme hyaluronidase can potentially hydrolyze the hyaluronan deposits, and restore sliding of the muscle fibers and fascicles.
Courtesy of Dr. Susie Kwon, MD, NY, New York.

Dystonia

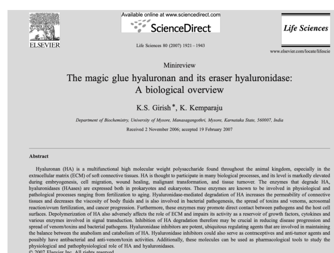
Neural mechanisms of spasticity do not fully explain the motor dysfunction in patients with spastic disorders.

Peripheral non-neural mechanisms are not fully understood.

The hyaluronan hypothesis postulates that the accumulation of hyaluronan, which functions as a lubricant in the extracellular matrix of muscle, may lead to the development of muscle stiffness.

Hydrolysis of the accumulated hyaluronan may be safely achieved using local injections of the enzyme hyaluronidase to reduce muscle stiffness and increase both passive and active motion.

Hyaluronidase is a potential emerging treatment for the management of patients with spastic movement disorder.



Available online at www.sciencedirect.com
ScienceDirect
Life Sciences 80 (2007) 1921–1943
Life Sciences
www.elsevier.com/locate/lifescie

Minireview

The magic glue hyaluronan and its eraser hyaluronidase: A biological overview

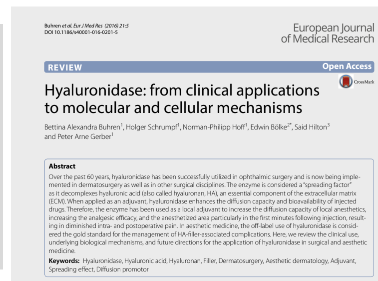
K.S. Girish *, K. Kemparaju

Department of Biochemistry, University of Mysore, Manasagangothri, Mysore, Karnataka State, 560007, India

Received 2 November 2006; accepted 19 February 2007

Abstract

Hyaluronan (HA) is a multifunctional high molecular weight polysaccharide found throughout the animal kingdom, especially in the extracellular matrix (ECM) of soft connective tissues. HA is thought to participate in many biological processes, and its level is markedly elevated during embryogenesis, cell migration, wound healing, malignant transformation, and tissue turnover. The enzymes that degrade HA, hyaluronidases (HAases) are expressed both in prokaryotes and eukaryotes. These enzymes are known to be involved in physiological and pathological processes ranging from fertilization to aging. Hyaluronidase-mediated degradation of HA increases the permeability of connective tissues and decreases the viscosity of body fluids and is also involved in bacterial pathogenesis, the spread of toxins and venoms, acrosomal reaction/ovum fertilization, and cancer progression. Furthermore, these enzymes may promote direct contact between pathogens and the host cell surfaces. Depolymerization of HA also adversely affects the role of ECM and impairs its activity as a reservoir of growth factors, cytokines and various enzymes involved in signal transduction. Inhibition of HA degradation therefore may be crucial in reducing disease progression and spread of venom/toxins and bacterial pathogens. Hyaluronidase inhibitors are potent, ubiquitous regulating agents that are involved in maintaining the balance between the anabolism and catabolism of HA. Hyaluronidase inhibitors could also serve as contraceptives and anti-tumor agents and possibly have antibacterial and anti-venom/toxin activities. Additionally, these molecules can be used as pharmacological tools to study the physiological and pathophysiological role of HA and hyaluronidases.



Buhren *et al. Eur J Med Res (2016) 21:5*
DOI 10.1186/s40001-016-0201-5
European Journal of Medical Research

REVIEW Open Access

Hyaluronidase: from clinical applications to molecular and cellular mechanisms

Bettina Alexandra Buhren[1], Holger Schrumpf[1], Norman-Philipp Hoff[1], Edwin Bölke[2*], Said Hilton[3] and Peter Arne Gerber[1]

Abstract
Over the past 60 years, hyaluronidase has been successfully utilized in ophthalmic surgery and is now being implemented in dermatosurgery as well as in other surgical disciplines. The enzyme is considered a "spreading factor" as it decomplexes hyaluronic acid (also called hyaluronan, HA), an essential component of the extracellular matrix (ECM). When applied as an adjuvant, hyaluronidase enhances the diffusion capacity and bioavailability of injected drugs. Therefore, the enzyme has been used as a local adjuvant to increase the diffusion capacity of local anesthetics, increasing the analgesic efficacy, and the anesthetized area particularly in the first minutes following injection, resulting in diminished intra- and postoperative pain. In aesthetic medicine, the off-label use of hyaluronidase is considered the gold standard for the management of HA-filler-associated complications. Here, we review the clinical use, underlying biological mechanisms, and future directions for the application of hyaluronidase in surgical and aesthetic medicine.
Keywords: Hyaluronidase, Hyaluronic acid, Hyaluronan, Filler, Dermatosurgery, Aesthetic dermatology, Adjuvant, Spreading effect, Diffusion promotor

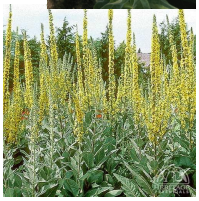
Polygonatum multiflorum Solomon's Seal

Solomon's seal is a yin tonic in Traditional Chinese Medicine that is nourishing, lubricating and moisturizing to the connective tissues of the body. It is considered specifically nutritive and moisturizing to tendons and joints and seems to help the tendons and ligaments adjust to variable tension on the structure, tightening when loose and loosening when tight. This is a specific agent that helps connective tissue structures and bones accommodate to the forces that are placed upon them. I use it as a powder, 100-250 mg 2-3 times a day or as a tincture, 15-30 drops 3 times a day.
Combines well with comfrey, teasel and/or horsetail.

Asparagus racemosa-Shatavari

Shatavari is a Sanskrit term that can be translated as "who possesses a hundred roots", or "husbands". It is considered both a general tonic and a female reproductive tonic. In Ayurvedic medicine, it is known as the "Queen of herbs", because it is a primary rejuvenative tonic for females, in the same way Withania is for males and it is revered for its ability to promote love and devotion. Shatavari reduces internal heat and improves lubrication of the muscules, joints and the mind. The major active constituents of A. racemosus are steroidal saponins (Shatavarins I-IV) that are present in the roots and are helpful in reducing inflammatory states in the fascia and connective tissues. Dosage is 1-4 grams per day.

Verbascum thlaspi-Mullein

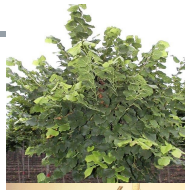


This can be nice as a nourishing herbal infusion, though, it is good to reduce the amount of herb to 15 grams/liter of water as it gets very mucilaginous, the root is especially rich in minerals and not quite as mucilaginous as the stalk or leaves.

Mullein leaf is mostly thought of as a respiratory herb, both the root and leaf are a good musculoskeletal remedy. Like Solomon's Seal and Shatavari, it seems to have a lubricating and hydrating effect on synovial membranes and fascia.

A liter of root infusion daily, mixes well with Tilia

Tilia platyphylla-Linden Flower



Flowering plant in the family Malvaceae (Tiliaceae).
Slimy, soothing, demulcent as a cold decoction
Diaphoretic and vasodilating as a hot decoction

Historically used to soothe nerves and treat health problems associated with anxiety… its calming nervine, antispasmodic, and helpful circulatory properties are used to help to ease spasms and cramps that contribute to headaches, tight muscles, and migraines as well as menstrual cramps

It tastes good and lends itself nicely to a strong herbal infusion-30 gms in a liter of water, a cold decoction of the flower makes a dependable mucilage.

Actaea (Cimicifuga) racemosa-Black Cohosh

Has a history of use as an anti-inflammatory and antispasmodic with action on the muscles and fascia with a relaxing, blood flow encouraging impact for joints and tendons. It works well in conjunction with Lobelia and Valerian.

It has a specific homeopathic indication for relieving neck pain and cramps caused by bad posture and aggravated by cold and humidity.

Doses of 15-20 drops of tincture 3-4 times a day seem helpful to restore damaged tissues and build durable fascial connections.

Comfrey-Symphytum officinalis

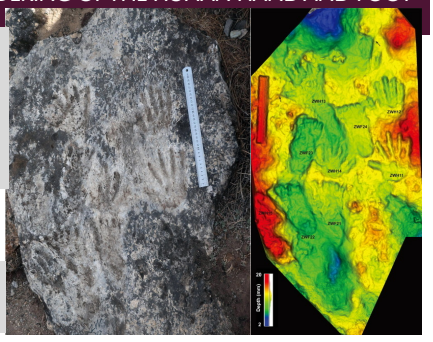
Comfrey possesses a remarkable ability to facilitate rapid healing of virtually all tissues.
It will help with the healing of fascia, broken bones, torn muscles, tendons or ligaments, and just about anything else. The presence of potentially liver toxic pyrrolizidine alkaloids in comfrey have prompted some people to avoid its use. While there is still much debate on whether comfrey use is likely to cause liver damage, very good herbalists have opinions on both sides of the debate. I urge you, if you choose to use comfrey, to look at the points presented on either side and make your own educated decision. I do not think that, taken in small doses and in limited duration, the use of comfrey in healing injuries poses more risk than the benefits

FEET ARE AN ENDLESS SOURCE OF FASCINATION

• Large heel	• Small heel
• Ankle adapted for walking	• Ankle adapted for climbing
• Stiff midfoot for propulsion	• Flexible midfoot (midtarsal break)
• Adducted big toe in line with other digits	• Grasping big toe

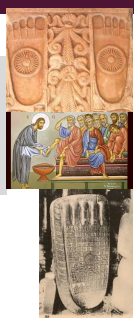
EARLIEST ARTISTIC RENDERING OF THE HUMAN HAND AND FOOT

169,000-226,000 BP, found at Fossil Hot Spring at Quesang, Tibet—
Believed to be intentionally made by two children who were track-making on the soft travertine which later hardened.



500-year-old feet petroglyphs from Newspaper rock, Utah

SACRED FEET



The concept of Sacred feet is deeply rooted in various spiritual traditions across the world, including the Hindy paths of Vaishnavism, Purana, Shaktism, and Shaivism. In these contexts, Sacred feet represent the divine, embodying holiness, purity, and a pathway to salvation.
They are the part of us that connect us to the Earth, they are also the witness of our journey through life.

CHARAN SPARSH

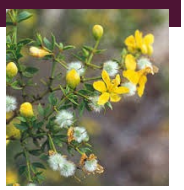
In Hindu culture, the act of touching the feet of elders, teachers, and deities holds deep spiritual, cultural, and emotional significance. Known as "*Charan Sparsh,"* this sacred gesture is much more than just a physical act; it embodies respect, gratitude, humility, and reverence. By bowing down and touching the feet of those who have imparted wisdom, love, and guidance in our lives, we acknowledge their invaluable role in shaping our thoughts, values, and actions.

This practice not only honors the life experiences of our elders but also allows us to symbolically receive their blessings and divine energy. It reminds us of the importance of selflessness, submission, and surrender to the wisdom of those who are our mentors, guardians, and spiritual guides. Rooted in ancient Hindu philosophy, the act of "*Charan Sparsh*" is believed to be an invitation to spiritual growth and enlightenment. It signifies that we remain humble, open to learning, and committed to nurturing the timeless traditions of respect and love.

FOOT WASHING

Washing another's feet is a significant ritual act in most of the major religious systems of the world, it is an act that symbolizes purification and respect for the divine, a cleansing practice that takes place before worship and reflects humility. It is exemplified by Krishna's act towards the Brahmans when he washed their feet , Rasik Murar's comparable gesture with the saints, and Christ's washing of his disciples' feet before the last supper. Washing someone's feet serves as a profound expression of respect and devotion in spiritual practices.

LARREA TRIDENTATA-CREOSOTE BUSH



The leaves are ground into a powdered extract that can be brewed into tea, which was the form used by Native Americans for centuries to treat various conditions such as respiratory illness, chickenpox, snakebite and arthritis pain, commonly drank as a tea and used as a foot bath.

Multiple active ingredients, the most prominent being nordihydroguaiaretic acid (NDGA), which has potent antioxidant properties.

NDGA is found in many plant species and has been used as a food additive in low concentrations.

The best and safest use is as a tea administered before meals. Disrupts biofilm structures. Antifungal

Can be hepatotoxic in excessive dosages.

THERAPEUTIC FOOT BATHS

In Traditional Chinese Medicine, the human foot is said to be the root of the body, its connection with the Earth, a connection that directly feeds one's essence, Jing, which is stored in the kidneys and relates to longevity and vitality.
The foot is the beginning of the three yin meridians (liver, spleen, and kidney) and the end of the three yang meridians (stomach, gallbladder, and bladder).

Simply using alternating hot and cold foot baths can be wildly helpful—this type of contrast hydrotherapy will move blood into and back out of areas of the body that are congested due to inflammation.

Aromatic herbs have long been used for therapeutic foot and body baths, often minerals like Epsom salts and sodium bicarbonate are added for greater effect, and these kinds of foot baths have been used for hundreds of years with the idea that we are medicating the whole body through the feet

The following recipe for a foot bath has been shown to be very effective at reducing hypertension:
15g Uncaria 20g Chrysanthemum 20g, Prunella vulgaris 30g Schisandra, 10g, Eucommia 15g Angelica 25g of Apocynum and 20g of Cassia apocynum, the preparation is said to calm the liver, relieve wind, clear heat and promote blood circulation, It works, it smells pleasant and unique, sitting with your feet in a hot bath is bound to lower your blood pressure, this preparation may have an effect for 12-24 hours.

Hydrotherapy

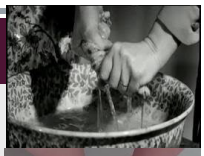
Contrast Hydrotherapy, a recent study published in the journal Frontiers in Immunology found that contrast hydrotherapy significantly improved fatigue, pain, spasticity, and quality of life in patients with neuroinflammation. The hot-cold contrast was found to have a positive effect on immune function, reducing inflammation and promoting a healthier immune response, significantly improving balance, gait and nerve regeneration.

The 2023 paper showed that even 5-minute cold immersion therapy alone is associated with a facilitated positive affect and reduced negative affect, which are linked to changes in connectivity between large-scale brain networks.

WET SHEET PACK

Patient gets in a very warm bathtub for at least 15 minutes,
Consuming hot tea (ginger) improves effectiveness.
Upon arising from the bath, the patient is bundled in a large bath towel and a wool blanket.
The heat from the bath and tea are both preserved and patient will often develop and maintain a fever of 102-103^0 F
They can be kept in this state for several hours, if warranted

WET SOCKS TREATMENT



This is essentially a warming compress in the form of socks, the treatment acts to reflexively increase circulation throughout the body. It has a sedating action and many patients report that they sleep much better during the treatment. It is effective for pain relief and increases the tissue healing response.

Supplies:

- **1 pair white cotton socks**
- **1 pair thick wool socks**
- **Towel (or two)**
- **Warm bath or warm foot bath**

Take a pair of cotton socks and soak them completely with cold water. Be sure to wring the socks out thoroughly so they do not drip.

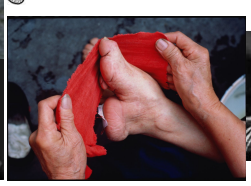
Place cold wet socks on feet. Cover with thick dry wool socks. Go directly to bed. Avoid getting chilled.

Keep the socks on overnight. You will find that the wet cotton socks will be dry in the morning.

CINDERELLA AND A WHOLE LOT OF CULTURAL ISSUES AND FEET

French author Charles Perrault is often called the "father of the fairy tale" for his well known tales such as "Little Red Riding Hood," "Puss in Boots," "Sleeping Beauty," and "Cinderella." Cinderella is a famous folk tale, a story that has been passed down for many generations, about a young woman trying to overcome the cruelty of some of her family. There are numerous different versions of the story, with historical roots in places as far apart as China and Italy. Perrault's version circa 1697 is the one made famous by Disney in 1950. He was the first to include the famous pumpkin, fairy godmother, and the glass slipper.

FOOTBINDING



SERIAL CASTING

Foot binding principles applied to congenital deformities.

Billie Cusick at Progressive Gaitways in Telluride, CO does a series of training programs that are excellent.
She uses Turtle braces—heat moldable material that has a zipper!!

PROGRESSIVE GAITWAYS

PISCIDIA ERYTHRINA-JAMAICAN DOGWOOD

Traditionally used for spasm and associated pain of uterus and skeletal muscle. It is indicated in insomnia, dysmenorrhea with associated nervous and/or musculoskeletal tension, migraine headaches and neuralgia.

It is very useful for pain, general distress, inflammatory fever, rheumatism, spasmodic cough, bronchitis, intestinal colic, gall-stone colic, renal colic, labor pains, facial neuralgia, ovarian neuralgia, sleeplessness, delirium, and toothache. Eases muscle spasms and cramps, especially of nervous origin.

The isoflavonoid (rotenone) is antispasmodic and a cardiac sedative, it is responsible for the plant's toxicity.

Dosage is 1-2 grams dried bark as a powder or tea daily in divided doses.

PEDICULARIS SPP

Members of the Pedicularis genus are varyingly called "Lousewort" or "Wood Betony". The genus name, "Pedicularis", was established in 1753 by Linnaeus, and is derived from the Latin "pediculus", or "louse".

Pedicularis species are used medicinally as a skeletal muscle relaxer and general sedative.

The flowers are often made into a tea or smoked. Extracts of the flowers have a strong relaxing effect when smoked. When used in a smoking blend, they add a nice flavor and relaxing effect.

Oral Dosage: 100-300 mg 3-4 times a day

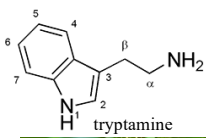
Tincture—10-30 drops four times a day

MITROGYNA SPECIOSA-KRATOM

Kratom is a tropical tree in the coffee family (Rubiaceae), it is native to Southeast Asia and its foliage is used for the treatment of diarrhea, the improvement of mood and affect and as a pain reliever. There are more than 40 compounds in kratom leaves, including Raubasine, an anxiety relieving alkaloid also found in Rauwolfia serpentina and corynantheidine, also found in Corynanthe yohimbe.

The chemical structure of the mitragynine alkaloids, mitragynine, mitraphylline, 7-hydroxymitragynine and mitragynine pseudoindoxyl. Incorporate a tryptamine nucleus which is likely responsible for their effect on the serotonin and adrenergic systems. Mitragynine, is considered to be a strong analgesic.

Lower dosages, 400-1200 mg, have a stimulating effect, 2-3 gm doses are more overtly pain relieving.



tryptamine

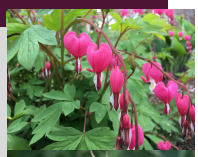
Dicentra Formosa-Western or Pacific Bleeding Heart

Botanical cousin to the papaveraceae

Historically used topically for tooth pain

Used by the Eclectics and Physiomedicalists of the 1800's for cancerous conditions and neuropathic pain

Fresh plant tincture—root and leaf--a narcotic-analgesic for pain and central nervous system disorders. The root is the strongest part, and a tincture of the root has been used for sore teeth, lost fillings, or mouth trauma. Any part of the plant can be applied locally to painful sprains, bruises, or contusions.
Dose is 1-2 ml of 1:3 fresh plant tincture 3 times a day or 2-3 grams of root 2-3 times a day



HYDROPHILIC CREAMS

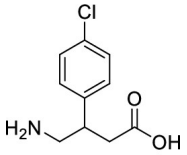
Hydrophilic creams are fun and easy to make, I usually custom make them for specific patient problems, most of the time for musculoskeletal and neurological pain syndromes. We start with a base of 1 liter of macadamia nut oil, make it hot, I like a double boiler, add 300 gms of beeswax and 175 gms of emulsifying wax (cetearyl alcohol). Put it in your counter top mixer at top speed and let a whipping frenzy begin, I have had wonderful successes with peripheral neuropathy and CRPS (complex regional pain syndrome) with the following cream recipe:

- 1 oz. Aconitum napellus tincture
- 1 oz. Veratrum viride tincture
- 1/2 oz. DMSO

Mix into 100 gms cream base very slowly while stirring with a wooden tongue depressor.

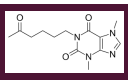
BACLOFEN

Baclofen, β-(4-chlorophenyl)-γ-aminobutyric acid, holds a unique position in neuroscience, remaining the only U.S. Food and Drug Administration (FDA) approved GABA-B agonist. While intended to be a more brain penetrant, i.e, ability to cross the blood-brain barrier (BBB), version of GABA (γ-aminobutyric acid) for the potential treatment of epilepsy, baclofen's highly efficacious muscle relaxant properties led to its approval, as a racemate, for the treatment of spasticity. Interestingly, baclofen received FDA approval before its receptor, GABA-B, was discovered and its exact mechanism of action was known. We find that a topical preparation with 3% baclofen in a hydrophilic base is very helpful for conditions of neuropathy and spasticity, it can be applied three times a day.



baclofen

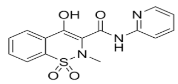
PENTOXIFYLLINE



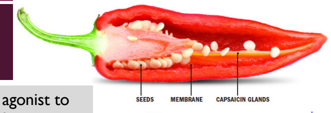
Pentoxifylline (Trental) is a derivative of dimethylxanthine that decreases the viscosity of the blood, enhancing oxygen delivery to tissues, particularly in patients with chronic peripheral arterial disease. Topical formulations of pentoxifylline enable localized treatment, which has the advantage of reduced systemic side effects compared with oral administration; this is especially beneficial for patients who are unable to tolerate the oral form or those requiring targeted therapy. The topical cream (3-5%) in hydrophilic base has been used for decades in diabetic wound care, and is commonly applied in the management of peripheral vascular diseases such as intermittent claudication. We find that a 3% cream with 3% piroxicam and 3% baclofen to be very helpful topically for spasticity and arthritic pains.

PIROXICAM

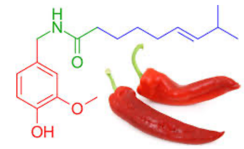
Piroxicam is a benzothiazine and monocarboxylic acid amide and a non-steroidal anti-inflammatory drug of the oxicam class, it is used to relieve pain and works by preventing the production of endogenous prostaglandins involved in the mediation of pain, stiffness, tenderness and swelling. It has a role as an analgesic, a cyclooxygenase 1 inhibitor, a non-steroidal anti-inflammatory drug, a prostaglandin-endoperoxide synthase inhibitor and an antirheumatic drug. It is fat-soluble and lends itself to topical application in situations where you need more specific anti-inflammatory effect, we use 0.5-3% concentrations.

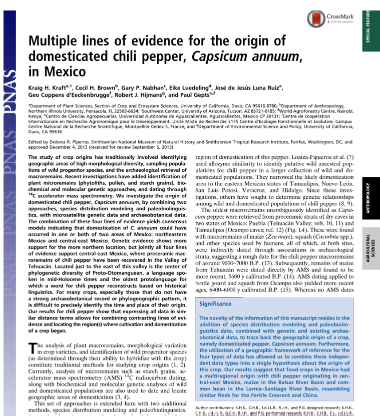


CAPSAICIN



Capsaicin, a member of the vanilloid family, binds as an agonist to vanilloid receptor subtype 1, an ion channel trans-membrane receptor in the sensory pathway. This receptor is also stimulated by temperature changes, physical abrasion, pH changes, and endogenous lipids. When activated, it starts a neural depolarization cascade that allows the influx of sodium and calcium ions. Capsaicin reduces pain transmission by desensitizing the sensory afferent axons. This phenomenon occurs due to a release of substance P triggered by the calcium influx, causing the initial burn, but after repeated application, capsaicin depletes the neuron of substance P and the burning sensation, as well as local pain is relieved. We use a *Caspicum annuum* tincture as our capsaicin source and use it in a hydrophilic cream base at 10%--that is 3 ml of tincture (5:1) in 30 gms of base





Multiple lines of evidence for the origin of domesticated chili pepper, *Capsicum annuum*, in Mexico

FOOT FETISH

Two categories: clean or dirty feet

Let your imagination run wild…

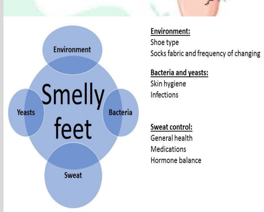
Feet are the most common body part fetish and shoes are the most common accoutrement fetish…

FOOT ODOR-BROMODOSIS

Bromodosis is due to a buildup of sweat in enclosed footwear, which results in bacteria growth on the skin that produce odors. These bacteria are naturally present on our skin as part of the human microbiome. The front part of the foot produces the most sweat.

Given that socks directly contact the feet, their composition can affect foot odor. Synthetic materials like polyester and nylon afford less ventilation to the foot than do cotton or wool, leading to increased perspiration and odor, although they can also reduce incidence of blisters by wicking away perspiration. Many synthetic socks are treated with chemicals to help reduce odor.

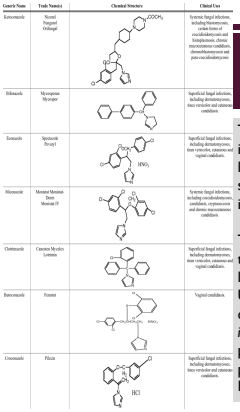
Wearing closed-toe shoes without socks leads to accumulation of sweat, dead skin cells, dirt, and oils, further contributing to bacterial growth and odors of renown.



FOOT FUNGUS/ATHLETE'S FOOT

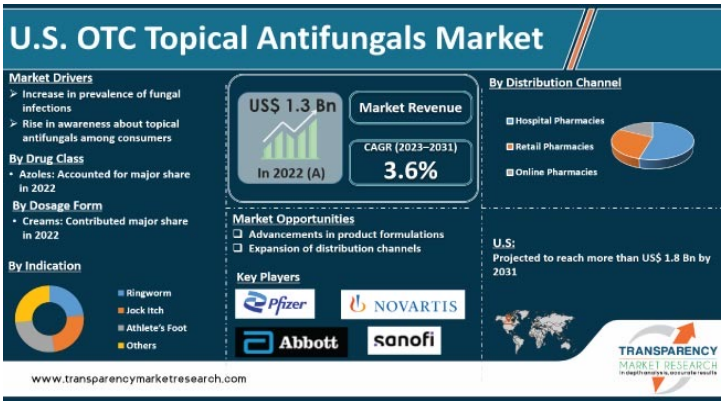
Tinea pedis, commonly known as athlete's foot, results from fungal infections on the skin of the feet caused by dermatophytes, including *Trichophyton rubrum, T mentagrophytes, T interdigitale, and Epidermophyton floccosum.* This infection typically occurs through direct contact with the organism while walking barefoot in locker rooms, showers, and swimming complexes. Individuals with diabetes and those who wear occlusive shoes are at an increased risk.

TOPICAL ANTI-FUNGAL APPROACHES-

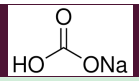


Topical imidazoles such as clotrimazole, econazole, ketoconazole, miconazole, isoconazole, tioconazole, and sulconazole offer effective remedies with a very low incidence of adverse effects. They interfere with the Cytochrome P450 system of both humans and the fungus, some people experience an increase in their liver enzymes as a result, even topical application can do this.

Topical application of terbinafine and amorolfine yields faster results in treating tinea pedis than clotrimazole treatment, adding a topical keratolytic, like a 3-5% salicylic acid, can be beneficial in patients with hyperkeratosis. Using prophylactic tolnaftate powder after swimming and showering in community settings reduces the levels of toe cleft tinea pedis caused by *T interdigitale*. Generally, topical treatment lasts for 4 weeks, although some patients may experience symptom resolution sooner. Terbinafine 1% can provide effective results for interdigital tinea pedis after 1 week. Repeated KOH scrapings and cultures should yield negative results.

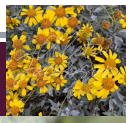


BAKING SODA-SODIUM BICARBONATE



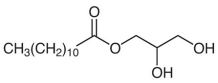
Baking soda is notably anti-fungal, and it controls odors. Adding it to one's shoes is a rapid way to resolve both foot fungus and foot odor. The baking soda tends to have a drawing effet, increasing the amount of sweat from the feet, it is imperative to keep the feet as dry as possible—a second or third pair of shoes to change into with fresh socks through the day. Baking soda is not kind to all of the materials that shoes are made from and can seep through the fabric as a white crust, no one loves that but it may be a small price to pay.

ENCELIA FARINOSA-BRITTLE BRUSH



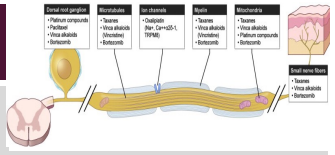
A member of the Asteraceae family, a perennial shrub with a native distribution that grows throughout the Sonoran desert from northern Mexico to Arizona including the Mojave Desert and the coastal chaparral of southern California, the interior valleys of southern California, and southwestern Utah. This shrub is very drought tolerant and important for revegetation and erosion control and habitat restoration.
It reproduces asexually by being easily broken and portions of branches get deposited elsewhere and root. The broken ends secrete a yellow resin that dries and can be easily collected. A standard beeswax and olive oil salve with 10% Encelia resin added to it is amazingly antifungal and smells wonderful—you too could garner the nickname honeyfoot.
Depending on the presentation of the fungal infection, a beeswax and olive oil preparation may not suit your needs, it tends to be heating.

MONOLAURIN



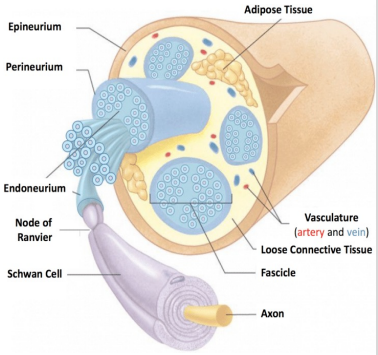
Monolaurin, glycerol monolaurate (GML)—is the monoester formed from glycerol and lauric acid. Lauric acid is a naturally occurring 12-carbon medium-chain saturated fatty acid. The significant dietary sources of GML are coconut oil, human breast milk and palm kernel oil. GML is a surfactant and has been used for decades as a dispersant and emulsifier in the cosmetics industry and as a preservative food additive in the food industry. The antimicrobial activity of fatty acids and their esters is well known, with chain length, unsaturation (cis, trans), and functional groups all being variables that affect this activity. GML is 1 of the more potent of these antimicrobial agents, being up to 200 times more effectual than lauric acid in bactericidal activity against certain microbes in in vitro studies. Dosage begins at 1-5 grams and it is helpful to reduce the systemic fungal load.

PERIPHERAL NEUROPATHY



An umbrella term for nerve conditions that affect a specific subdivision of the nervous system. Many different conditions can cause peripheral neuropathy, which means a wide range of symptoms is also possible. Peripheral neuropathy can also affect different body parts, depending on how and why it happens—diabetic neuropathy and chemotherapy induced neuropathy are the most common causes and occurs in hands and feet. About 2.4% of people globally have a form of peripheral neuropathy. Among people 45 and older, that percentage rises to between 5% and 7%.

Neuropathy is a common complication of diabetes, peripheral artery disease (PAD), alcoholism, autoimmune disorders and exposure to toxins/medications. Loss of protective sensation means that individuals may not feel pain or discomfort from minor injuries or pressure points, increasing the risk of unnoticed wounds and subsequent complications.



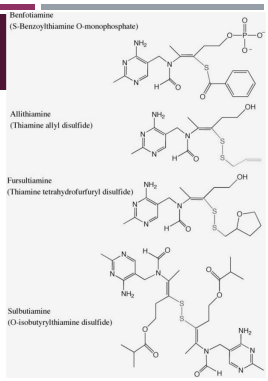
A nerve is made up of bundles of neuronal dendrites and/or axons

The fibers are protected by myelin and outside the Schwann cell membrane the axon is covered by a fascial stocking, the endoneurium bundled into fascicles inside perineurium.

Several fascicles are then bundled inside the epineurium with more fascia, fat, and blood vessels. In a transected nerve, these fascicles are seen pouting from the cut surface, their perineurial sheaths well-defined and strong enough to be grasped by fine instruments. The groups of fascicles that make up a nerve trunk are enclosed in an even thicker fascial coat, the epineurium. The epineurium varies in thickness and is particularly strong where the nerve is subjected to movement and traction, for example near a joint.

SULBUTIAMINE/ BENFOTIAMINE/ FURSULTIAMINE

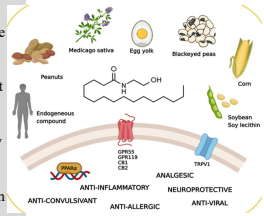
Fat-soluble forms of Thiamine (B1)-derived from garlic-derived allithiamine.
Lipophilicity allows for better neurological uptake and utilization
Sulbutiamine and Fursultiamine have CNS anti-inflammatory effect and reduce mental fatigue
Benfotiamine has anti-inflammatory effect in peripheral nervous system
neuropathy
neuralgias
Dosage is 50-200 mg 1-2 times/day--

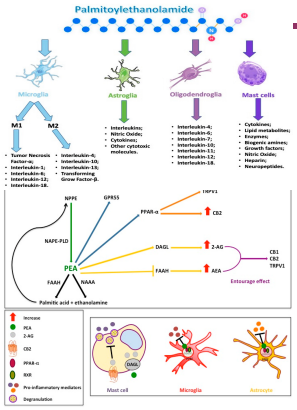


PALMITOYLETHANOLAMIDE-PEA

Naturally occurring fatty acid amide which was first isolated and described in 1957 as N-(2-hydroxyethyl)-palmitamide. Initially extracted from soybean lecithin, egg yolk, and peanut meal it was reported to have anti-inflammatory properties and found to be an endogenous compound in the human body.

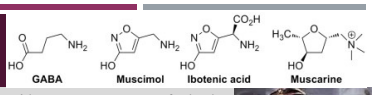
PEA is a member of the "endocannabinoid system" and possesses a bio-similarity and synergy with the CB1and CB2 agonist, anandamide. It belongs to the so-called "paracannabinoid messengers" and provides a consistent analgesic effect through peripheral and central nociceptive mechanisms and modulates several protective responses in inflammatory and pain conditions through modulation of both mast cell and glial cell activity in neuro-inflammatory conditions.
The first clinical applications of oral PEA formulations were published in the mid 1970's evaluating the use of PEA as a respiratory infection prophylactic and reported a significant reduction in systemic pain, reduction of fever, and lowered incidence of URI's.





PEA inhibits peripheral inflammation and mast cell degranulation, as well as exerts neuroprotective and antinociceptive effects; these actions are accompanied by a decrease in NO production, neutrophil influx, and the expression of proinflammatory proteins, such as iNOS. PEA protects endothelial function from oxidative and inflammatory injuries and improves neurological, emotional, and biochemical outcomes following TBI through amelioration of the secondary injury components of TBI.
We find that dosages of 300-600 mg/day can be very helpful in mitigating flares, improving energy levels and reducing neurological inflammation. Most commonly we employ a strategy of 600 mg/day for 3-4 weeks, then 300 mg/day for 3-4 weeks and then take a month or two off.

AMANITA MUSCARIA- FLY AGARIC



Possibly the worlds oldest hallucinogen, linguistic evidence suggests use as far back as 4000 BCE…Arguably the 'Soma' of the Hindu Vedas
Used worldwide as a spiritual sacrament-from the Kamchatka peninsula of Russia to the Ojibwa people of the Great Lakes region of North America and into Meso-America

The major isoxazoles are ibotenic acid and muscimol
Decarboxylation of neurotoxic ibotenic acid during drying or digestion can result in the formation of less toxic, more psychotropic muscimol.
Share a structural similarity with glutamic acid and GABA.
Ibotenic acid is an agonist of NMDA receptors-causes an agitated delirium
Muscimol is a potent $GABA_A$ agonist that affects brain serotonin, noradrenalin, and dopamine levels in a manner similar to LSD, psilocybin, and mescaline.

Dosage: 10-15 mg Muscimol—Depending on source—1-3 mushroom caps

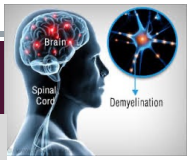
TOPICAL APPLICATION

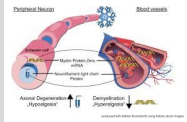
Often a tincture can be applied topically on the order of 2-3 drops to an area in pain, or, more commonly, added to a lotion or pain cream. A tincture preparation like the following mixed into a lotion or salve base can be very effective for nerve pain:

1 oz Amanita muscaria 1:3 tincture or acetract
1 oz. Lobelia acetract
1 oz Atropa belladonna acetract
1 oz DMSO

The Amanita is specific for swollen, inflamed nerves, like a sciatic nerve that causes a spasticity of the low back.
The Lobelia and Belladonna are both nice topical antispasmodics. I have seen this preparation work very rapidly to bring relief that wasn't forthcoming by other means.

SPECIFIC NEUROPATHY TREATMENTS





Topical transdermal gel: 10% Ketamine, 6% Gabapentin, 3% Pentoxifylline—8% diclofenac and 2% amitryptiline also worth considering

R-Alpha Lipoic Acid—600 mg/day is often very helpful

Methyl donors—Levomefolic Acid (5-MTHF) 5 mg/day, Pyridoxal 5 phosphate 200 mg/day, Methylcobalamin 2 mg/day

Sulbutiamine/Benfotiamine/Fursultiamine-Fat soluble Thiamine derivatives--50-400 mg/day

Agmatine—Derived from the decarboxylation of Arginine, peripheral vasodilator 1-1.5 gms/day.

Alternating hot/cold foot baths 4 min. hot/1 minute cold—9-10 alternations before bed.

Wet Socks—damp cotton socks placed on feet before bed with wool socks over

ACUTE BONE INJURIES, BROKEN BONES AND CONTUSIONS

These are injuries that are generally going to take at least 6 weeks for recovery. Not weight bearing is the hardest part for most people.

Pain relief can be achieved with anodyne and analgesic botanicals, stabilization of fractures is critical.

Anabolic botanicals like Cissus, Panax, Symphytum, Anantamul combine well with an anabolic dietary strategy.

Minerals like calcium (hydroxyapatite), magnesium (threonate, malate, taurinate), zinc (monomethionine aspartate), silicea can be helpful in encouraging the healing response.

CISSUS QUADRANGULARIS

Cissus quadrangularis is an ancient medicinal plant that was prescribed in the ancient Ayurvedic texts as a general tonic and analgesic with specific bone fracture healing properties.

Modern research has shown it to have a glucocorticoid antagonistic effect, it has anabolic effects in its ability to offset cortisol effects, it helps preserve muscle mass as well as bone mass.

It has a relaxing effect and promotes deeper more restful sleep.

A wonderful recovery agent on its own or married to Hemidesmus, Withania, or Panax.

Dosage is 100-500 mg 3 times a day

WITHANIA SOMNIFERA-ASHWAGANDHA

Ashwagandha is a Sanskrit name meaning "the smell and strength of a horse"

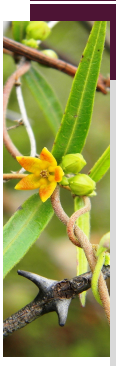
It has a mild sedative action, which is why the species name somnifera.

The constituents of this plant include the steroidal compounds withaferin A (a steroidal compound with a molecular structure incredibly similar to cortisol) and several sitoindosides.

This plant is a member of the Solanaceae family and so, also contains several tropane alkaloids like tropine and pseudotropine.

One of the theories that might explain why this plant can have dramatic effects on testosterone levels in men and women is that some of its steroidal constituents will bind to cortisol receptors, inhibiting binding of cortisol. These compounds will exert an effect on the cortisol receptor that is much less than a cortisol induced effect and is relatively sedating.

In essence, Ashwagandha may have the ability to effectively block catabolic activity via blocking cortisol. I dose this herb at 2-5 grams before bed for most people



HEMIDESMUS INDICUS

Indian Sarsaparilla is regarded as a bitter, blood purifier, astringent, depurative, carminative, tonic, anti-syphilitic, anti-leucorrheic, antiviral, antifungal, antibacterial, anti-inflammatory, anti-diarrheal, anti-rheumatic, febrifuge and alterative.

This herb is useful in autoimmune/rheumatic conditions, chronic skin disorders (esp psoriasis), leukoderma, gonorrhea, asthma, bronchitis, hemorrhoids, jaundice and dysentery.

Clinically effective at helping people maintain an anabolic state.

Dosage is 1-4 grams/day

It is a pleasant smelling powder

BUNION

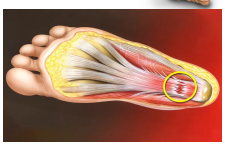
A bunion refers to a bony bump at the base of the big toe. The most common form of bunion, "hallux valgus," is formed by a change in the alignment of the bones., it is a failure of the metarsal arch and the collapse has pushed the big toe medially.
This is related to bad footwear and some predisposing genetics. Cowboy boots and high heeled shoes with pointy toes are direct contributors to this phenomenon. It represents a type of modern footbinding. Serial casting can help prevent further migration of the bone, but once the arch has collapsed, it has to be rebuilt.
Consider minimalist footwear with a wide toe box and flat heel, ease into them by wearing them for short durations until your foot conforms to them.

Footwear is the primary cause of most of the significant foot issues for which people seek out medical care—including bunions, corns, hammer toes, neuromas, fungal infections, and plantar fasciitis.




PLANTAR FASCIITIS

A prevalent and painful condition arising from the degenerative irritation of the plantar fascia origin at the medial calcaneal tuberosity of the heel and its surrounding perifascial structures. The plantar fascia comprises 3 segments originating from the calcaneus and plays a pivotal role in maintaining the normal biomechanics of the foot, providing essential arch support, and serving as a shock absorber.. In the United States, millions of individuals suffer from heel pain each year, with plantar fasciitis being a primary culprit. While multifactorial in its origins, overuse stress is often the leading cause, presenting with sharp localized pain at the heel and, occasionally, a heel spur.



ATROPA BELLADONNA- DEADLY NIGHTSHADE

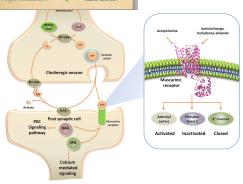
Atropa belladonna, is named for *Atropos*, one of the three fates in Ancient Greek mythology. This particular fate was responsible for cutting the thread of life. Her second name has associations with the Italian goddess of battle *Bellona*.

Consumption creates a light sensitivity and blurred vision (due to dilation of the pupils), a sense of floating and spatial expansion beyond the body, drying of bodily fluids and inability to urinate, altered heart rate, sweaty hands, and a sense of being surrounded by the dead.

Contains the tropane alkaloids atropine, scopolamine, and hyoscyamine, which are made in the roots of the plant and collect in the leaves and stems after harvesting the plant.

All parts of the plant contain tropane alkaloids. Roots have up to 1.3%, leaves 1.2%, stems 0.65%, flowers 0.6%, ripe berries 0.7%, and seeds 0.4% tropane alkaloids; leaves reach maximal alkaloid content when the plant is budding and flowering, roots are most potent at the end of the plant's vegetation period. Belladonna nectar is transformed by bees into honey that also contains tropane alkaloids. The berries pose the greatest danger to children because they look attractive and have a somewhat sweet taste, each berry can contain 2 mg of atropine. The root of the plant is generally the most toxic part, though this can vary from one specimen to another





BELLADONNA PREPARATIONS

Assuming 1.2-1.3% alkaloidal content in leaves and roots, with a preponderance of the alkaloids in the form of L-Hyoscyamine (87.6% in Leaves and 68.7% in roots), which converts into a less active, more stable racemic mixture of D,L-Hysocyamine. A standard dilution for a tincture is 1:5 dilution of herb in solvent, which produces a product that is 2.4-2.5 mg of alkaloid per ml of tincture. The solvent is usually a higher alcohol percentage, usually 65%, and the addition of an acidic element like apple cider vinegar might help keep the alkaloids in a free base form.

Assuming 30 drops per ml, each drop is 83 mcg of tropane alkaloids, 5 drops provides 415 mcg or 0.415 mg…

Most atropine eyedrops are 1% so they are 10 mg/ml, and one uses 1-2 drops at a time, which is 0.33 mg/drop.

Atropine injections come as 0.05 mg/ml up to a 1mg/ml and for maintenance of secretions and an anti-vagal effect, dosage begins at 0.5-1 mg every two hours, for organophosphate poisoning dosage is 2-3 mg every 30 minutes, and in bradyasystolic cardiac arrest, dosage is 1 mg every 3-5 minutes with a maximum of 3 mg.

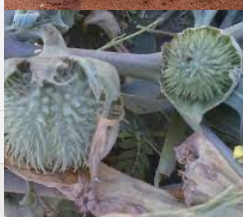
5 drops of tincture is often our dose, and we might do that 3-4 times a day in cases of gastrointestinal cramping, or to relax stiff muscles. It seems to have some affinity for the GI tract and skeletal muscle.

DATURA METELOIDES/WRIGHTII/INOXIA

A member of the Solanacae family, Datura is distinctive by large white "trumpet" flowers that uncoil in a five-pointed pinwheeling fashion.

Datura as a genus can be found across multiple continents, including the Americas, Asia, Europe, and South Africa. Its wide availability and physiologic properties, largely due to the presence of the tropane alkaloids.

A noted usage of Datura in Native California is in youth initiations where the root was processed into a drink or "tea" known historically as *toloache*. Initiates would often be instructed in cultural rules of entering adulthood and how to interpret the visions themselves. For some, these ceremonies were highly codified and included activities like vigils and the making of sand paintings that emphasized religious principles.

Tropane Alkaloids: Datura

- Jimsonweed, Locoweed, Sacred Datura, 'Potters asthma cure' in Europe
- *Datura* seeds have been found in Archaic period (at least 4500 years ago) sites in the Lower Pecos of Texas, in Ancestral Pueblo (AD 1250–1300) contexts in present-day Colorado, and in Mississippian (AD 1100–1200) contexts. Imagery and *Datura* fruit effigy pottery vessels confirm its presence from Mexico into the Southwest and Southeast regions of the US. The sixteenth-century Aztec-language Florentine Codex includes *Datura* as an important medicinal plant among the Aztecs.
- Antispasmodic
- Narcotic anodyne
- Psychotropic

500-year-old Chumash Datura flower depiction at Pinwheel cave, California

Datura Dosages

Given that our plant material is going to be leaves and aerial stems we are looking at material that is 0.9-1.0 mg/gm atropine and 0.33 mg/gm scopolamine, and we are making a 1:5 dilution, our finished product provides 0.2 mg/ml atropine and 0.066 mg/ml scopolamine, among other alkaloids that serve to temper the effect.
Scopolamine is more lipid soluble than atropine, so has greater effects in the central nervous system. Peripherally this results in smooth muscle relaxation and reduced gland secretion. Centrally scopolamine is more sedating, but anxiety and restlessness can occur at higher doses. The vomiting center of the brain is located in the medulla oblongata and scopolamine exerts an anti-emetic action by primarily affecting the M1 receptor.

The scopolamine patch is pure alkaloid in a sustained release form that delivers a 140 mcg loading dose when the patch is applied and then the medication is absorbed on the order of 0.5 mg/24 hrs for 3 days.

Our product is not pure alkaloid, but it is safe to say that the equivalent scopolamine loading dose from the tincture could be 2 mls, (132 mcg scopolamine), but the herbal product is effective at a lower dose range and we find that 5-15 drops is a decent dose for nausea and vomiting related to motion sickness or vestibular dysfunction. Acute asthma attacks will often respond to five drops administered orally.

PLANTAR FASCIITIS CREAM

In 400 ml of cream base, still melty and hot, add
50 ml of Datura acetract
50 ml Atropa acetract
75 ml Lobelia acetract
DMSO 25 ml

This can be applied to the affected foot 3 times a day and generally provides a tremendous amount of relief

A dynamic orthotic is generally a ¾ foot orthotic that compresses with body with body weight and then recoils upward with each step, causing activation of the muscles of the sole and the arches of the foot. Powerstep, Spenco and other companies make them, it is wise to get professionally fitted.