



TheElite Training Group track club

## Expanding the area of what is possible

In Track & Field Distance Running & Competent Self-Care in medicine and psychology

# TheETG running injury repair

### TheETG Training Packets

**Mission:** Expand the area of what is possible for human performance in distance running. One of TheETG methods of achieving that is to proliferate applied science based information by way of –free– packets containing plain language info for “the average joe” seeking to move themselves or others forward

**As you continue to acquire and apply more information** you continue to expand the area of what is possible.

**The functioning of brain cells, muscle cells, blood cells, -all cells-** are governed by the laws of nature. The laws of nature -are- the underlying mechanisms of how everything works. The laws of nature that control human cellular function are -not- governed by your chosen belief system or the dogma you have been indoctrinated into, or the dogma you refuse to set aside.

“Nature, to be commanded, must be obeyed.” —[Francis Bacon]

**Data-less conclusions founded upon faulty assumptions are the mother of all screw-ups.** They lead to human belief systems that quickly get set in stone insuring that new information gets shouted down as pride, ego, and resistance to change supplant data, logic and reason. Put data ahead of dogma. Follow the data -not- the crowd.

“In God we trust...Everyone else must bring data.” —[W.Edwards Deming]

To be a good track coach one must **-first- be a good physiologist.**

To be a good medical doctor one must **-first- be a good physiologist..**

To be a good physiologist one must -first- be willing to.....

- put data ahead of dogma, follow the data -not- the crowd
- put science ahead of indoctrinated tradition
- put logic and reason ahead of faulty assumptions
- put mechanisms ahead of correlations and “risk factors”
- put critical thinking and clinical reasoning ahead of a memorized set of “if-then” statements
- read and apply large amounts of published research
- accept outcomes as the judge and jury of your work

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# Order of Presentation

- Mechanisms Of Running Injuries
- **TheETG Injury Repair.....Achilles Strain**
- **TheETG Injury Repair.....Plantar Fasciitis**
- **TheETG Injury Repair.....Iliotibial (IT) Band Syndrome**
- **TheETG Injury Repair..... Patella tendonitis**
- **TheETG Injury Repair.....Hamstrings Problems**
- **TheETG Injury Repair.....Groin Pull**
- **TheETG Injury Repair.....Morton's Neuralgia**
- **TheETG Injury Repair.....Tibial "Stress Fractures" & Shin Splints**
- **TheETG Injury Repair.....Ankle Sprain**
  
- Tissue Healing & Repair
- Problems With Being Diagnosed Based On An MRI
- Reminder Page...Just Say No to Ice & Anti-inflammatories

## **Just say no to practitioners of traditional Sports Medicine.....**

".....primary research evidence only accounted for 24% of management....."

"Practitioners were unaware of literature supporting over 50% of the treatment modalities they used."

"This study highlights a lack of evidence base, a lack of knowledge of the research evidence..that is available for these conditions."

"Practitioners practiced evidence based medicine in under 50% of cases."

**I.R. Murray, et al**

**How Evidence Based Is The Management Of Two Common Sports Injuries In A Sports Injury Clinic?**

**British Journal Of Sports Medicine..Volume 39 #12...December 2005..page 912**

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"We understand the clinical implications of conditions such as tendinosis and stress fractures and can make the diagnosis, but we treat them imperfectly."

**Robert Leach [Editor.....American Journal Of Sports Medicine]**

**American Journal Of Sports Medicine.....Volume 28 #3.....2000.....page 281**





# Mechanisms Of Running Injuries

1. When a muscle//tendon lacks the -length-- necessary for movement through sport required range of motion....you **-will-** get injured
2. When a given tissue lacks the strength to endure your training loads...you **-will-** get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you **-will-** get injured

Injury consists of micro-tears in tendon and/or muscle.

Tendon is comprised of a protein called collagen. Similar to myoblast cells in muscle fibers, collagen fibers are produced by cells called fibroblasts. There are several stimuli that cause myoblast and fibroblast cells to lay down new and/or more muscle and/or collagen. Long hold stretches, high intensity strength training, massage/massage machines, ultrasound, electrical stimulation, etc, etc, etc.

## ----- Tissue Healing

Full tissue repair cannot occur in a timely manner **with rest alone**.

To promote tissue healing, one will need to engage in activities that promote the migration, proliferation, and activity of cells [ie. fibroblasts, myoblasts] that produce new tissue, repairing damaged structures.

The most effective stimuli are long hold stretches, high intensity strength training, pressure applied to tissue by massage machines, hot baths or Jacuzzi massage jets.

Traditional physical therapy [ultra-sound, electrical stimulation, any one of a number of manual tissue manipulation such as massage, rubber tubing strength exercises, etc] tend to be lower stimuli approaches.

## ----- Heal Faster

The primary reasons injuries often take people several weeks to several months to deal with are;

--- Providing a low or no stimulus for healing. Doing so-called "strengthening exercises" with little or no weight//resistance [ie. use of rubber tubing, etc]. The amount of weight/resistance determines the amount of stimulus for cells that are responsible for healing.

--- Doing a bunch of reps and sets of "strengthening exercises" with no progressive increase in weight//resistance as strength of the tissues increase.

--- The frequency of application of a strengthening stimulus is a major determining factor on the rate of healing. If you're seeing a physical therapist, chances are you'll be going only once or twice a week. If this is the only time that strengthening of the tissue is being induced, recovery will take quite a few weeks.

--- Multiple uses of ice, anti-inflammatories, and anything else that decreases blood flow to a healing tissue, and/or decreases immune cell function in and around a healing tissue.....will also account for a slow recovery time.

--- Recurrent attempts to return to training before the tissue has acquired the length and/or strength necessary to endure the training loads.

## ----- Usual Complications Of Running Injuries

If the length and/or strength of the tissue in question is insufficient to match the strength needed to endure your training you will have issues, independent of what shoes you wear or how much they cost, or how biomechanically great or awful your running form is currently.

Shoes can't lengthen or strength train your body's tissues.

Some of them are capable of reducing the motions of the foot in a manner that reduces the amount of strength your lower leg muscles must have to endure your training loads, and improvements in running form can have the same effect. But as the shoes wear out with use, their ability to provide this function wears out with them.

Rest, ice, anti-inflammatories.....of these, **none** will improve the tissue's ability to withstand your training/racing loads.



# What To Do At The First Sign Of An Injury

----- **7 day Shut Down Period** = no run training.

- No slowing or suppressing the rate of tissue recovery and regeneration by taking anti-inflammatories, use of ice or ice baths, or getting cortisone shots.
- No slowing or suppressing the rate of tissue recovery and regeneration by running in the pool, exchanging one form of overtraining for a continuation of same elsewhere.

----- **During the 7 days.....**

- 1 ----- protein consumption....3 to 4 days of increase of 50 – 100g above your normal level
- 2 ----- daily 10 minute hot bath with 4 – 8 cups of epsom salts
- 3 ----- daily range of motion [ROM's] [see the free pdf packet...TheETG ROM's located on TheETG website]
- 4 ----- daily tissue strengthening [see specifics on the pages below]
- 5 ----- daily walk 1 – 2 miles on a hilly course

## The importance of range of motion

This massive issue in our sport shows up --everywhere-- you look in the form of muscle spasms, cramps, micro-tears, strains, pulls too typically occurring at the worst possible time because these issues happen when your fitness level is moving forward.

Tissues tighten over time --due-- to training!!!  
They lose range of motion.

Once that process reaches critical mass, at some point during a warmup, a workout, a race, some sort of tissue problem or injury is all but inevitable. The rate of tissue tightening as your fitness level progresses may exceed the rate, frequency and/or effectiveness of your stretching protocols.

Just as strength training can be a stimulus for muscles and tendons to grow in width, long hold stretching such as for 5 to 10 minutes for each stretch is a stimulus for muscles and tendons to grow in length and for the nervous system to adjust, resulting in a sustained increase in range of motion. In TheETG we don't do traditional stretching before or after workouts. We have formal stretch sessions scheduled in the training program just as we have formal track workouts, road workouts, strength training, etc scheduled in the training program.

## Other issues

You'll find that muscle and tendon respond to what is done....and -not-- done.

For example.....sitting at a desk at work/school for many hours per day for many years means you're in a hip flexion position for many hours per day for many years. One should expect to see tight hip flexor muscles and tendons after a period of years, and perhaps lower back problems that may accompany them.

Also, sitting at a desk at work/school for many hours per day for many years means you're in a -knee- flexion position for many hours per day for many years. One should expect to see tight -knee- flexor muscles and tendons [ie. hamstring, calf] after a period of years.

That gradual loss of range of motion over time is due to exposing muscles and tendons to a given position for many hours per day for many years, without exposing them to the opposite position in a sufficient manner.....that's -not- about age or aging.

Muscle and tendon fibers respond to stretching sessions in a similar manner as strength training. Rather than gaining a wider width though, they get longer by adding more sections.

If a muscle/tendon lacks the -length- to allow for limb-joint movement through it's sport required range of motion....some sort of tissue damage should be expected.

The duration of the stimulus [how long you hold the stretch] determines the potency of the stimulus applied [though, a high frequency can take the place of a long duration].



# **Stay ahead of tissue tightening**

In sprinters, distance runners, etc....hamstring, calf, quad, cramping & muscle strains. Issues tend to occur at times when your fitness level is moving forward, and because your fitness level is moving forward.

Use Range Of Motion exercises to stay ahead of tissue tightening.

The rate of tissue tightening as your fitness level progresses in any given week/month may exceed the rate and frequency of stretching sessions and/or the effectiveness/potency of your stretching protocols [range of motion exercises = ROM's].

Look to successfully address that.

**protein**

**protein**

**protein**

**protein**

hot jacuzzi, hot bath  
autogenic Relaxation  
down-time

**Keep the body in an anabolic state.**

**If you get that done everything moves forward.**

**If you don't get that done, nothing else matters.**



# Achilles Strain

## Mechanisms Of Injury

1. When a muscle/tendon lacks the -length-- necessary for movement through sport required range of motion....you **-will-** get injured
2. When a given tissue lacks the strength to endure your training loads...you **-will-** get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you **-will-** get injured
4. foot turned outward in standing, walking, running increases the rate and magnitude of foot pronation (heel motion of rolling outward). This increases the amount of rotation of the tibia (lower leg) which increases the torsion forces placed on the achillies tendon.

## Increase Strength Of Involved Tissues

Start with whatever is well tolerated and progress to more aggressive effort.

## TheETG Tissue Strengthening -----

Strengthening = 4 reps with weight you can't lift more than 6 - 8 reps without stopping. Do 2 sets.

--- Hopping = on one leg, straight up and down, 1 landing is 1 rep, do 4 reps. Do 1 set.

--- 1/4 squat [one leg at a time].....going only 1/4 of the way down rather than going all the way down or halfway down. You're never in a sitting position when you run, you're in a 1/4 squat position during the stance phase of the running stride, that's as far down as you get when running, thus that is as far down as you should go in this exercise.

--- Calf raise [one leg at a time].....stand on one leg and push yourself up until the heel is slightly off the ground.

--- Balance "Skater Pose" .....on one leg, raise other leg to the rear. Do 4 reps slowly.

## Range Of Motion [ROM's] exercises

--- See the free pdf packet.....TheETG Range Of Motion on TheETG website.

".....in healing tendons the effect of mechanical loading, or its absence, is dramatic."

"Many studies show that tendons adapt to mechanical loading.....the healing of injured tendons comprises rapid proliferation and remodeling, and here the effects of mechanical loading is dramatic. Numerous animal studies show that immobilization of a healing tendon compromises the healing process."

"Patients with Achilles tendon injuries often have the injured limb immobilized for several weeks. Because animal data suggest that this impairs healing so much, it is important to develop clinical loading regimes during healing."

".....patients might be allowed early short loading episodes following for example, an Achilles tendon rupture, for a better outcome

**T. Andersson, et al**

**Tissue Memory In Healing Tendons:Short Loading Episodes Stimulate Healing**  
**Journal Of Applied Physiology.....Volume 107 #2.....August 2009.....page 417**  
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"The purpose of this study was to compare the results of operative and non-operative treatment of closed achilles tendon rupture."

"All patients were followed up with clinical evaluation at 3, 6, 12, and 24 months."

"18 patients had been operated on and 19 had been treated conservatively."

"In the operated group, 13 returned to previous athletic activity.."

"In the non-operated group, nine athletes returned to their level.."

"We conclude that operative treatment of Achilles tendon rupture is preferable, although non-operative treatment is an acceptable alternative method."

**M.Kaseta, et al**

**Comparison Of Surgical And No Surgical Treatment of Achilles Tendon Ruptures In Athletes**  
**Journal of Sport Sciences...Volume 18 #7..July 2000**  
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"Our patients in the non-operative group have now reached a minimum of 60 months after the rupture. There have been no additional re-ruptures."

"..during our continuing experience with non-operative treatment of achilles tendon ruptures with now more than 50 additional patients, we observed only one additional patient with re-rupture."

"a sutured tendon..because the biological healing process is not faster than in a non-operatively approximated tendon."

**M.Weber**

**American Journal Of Sports Medicine...Volume 32 #7..Oct/Nov. 2004..page 1777**  
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#### **birth control pills and the Achillies tendon.....**

"....recent evidence suggests that estrogen may decrease collagen density by attenuating fibroblast activity".

"....a sex based study has implicated higher endogenous estrogen levels in females with lower collagen fractional synthesis rates.

"The purpose of this study was to elucidate the effect of normal fluctuating [u]non[u]-monophasic oral contraceptive pill users] and low, consistent (monophasic oral contraceptive pill users users) endogenous plasma estrogen levels on the strain behavior of the Achilles tendon in vivo."

"....maximal isometric plantarflexion efforts were performed on a calf-raise apparatus while synchronous real-time ultrasonography of the triceps surae aponeurosis was recorded. Achilles tendon strain (%) was calculated by dividing tendon displacement during plantarflexion by resting tendon length."

"In conclusion, acute fluctuations in plasma estrogen across the menstrual cycle in non-MOCP users did not alter the strain behavior of the Achilles tendon. Conversely, long-term exposure to attenuated estrogen in monophasic oral contraceptive pill users resulted in a decrease in Achilles tendon strain..."

"These findings have a number of important functional and clinical implications."

A.L.Bryant, et al

Effects of estrogen on the mechanical behavior of the human Achilles tendon in vivo  
**Journal Of Applied Physiology.....Volume 105 #4....October 2008.....page 1035-1043**







# Plantar Fasciitis

## Mechanisms Of Injury

1. When a muscle/tendon lacks the -length-- necessary for movement through sport required range of motion....you -will- get injured
2. When a given tissue lacks the strength to endure your training loads...you -will- get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you -will- get injured

From a physical standpoint, injury consists of micro-tears in the thick sheet of tissue (fascia) that runs under the foot (called the plantar surface) from the heel to the base of the toes.

The fascia is comprised of a protein called collagen. There are also muscles along the bottom surface of the foot. Collagen is produced by cells called fibroblasts and muscle by myoblast cells. The objective is to stimulate the fibroblast cells and myoblast cells to produce tissue in a manner that results in an increased range of motion and strength of the plantar fascia, muscles, and tendons in the area.

## TheETG Tissue Strengthening -----

Strengthening = 4 reps with weight you can't lift more than 6 - 8 reps without stopping. Do 2 sets.

--- Hopping = on one leg, straight up and down, 1 landing is 1 rep, do 4 reps. Do 1 set.

--- 1/4 squat [one leg at a time].....going only 1/4 of the way down rather than going all the way down or halfway down. You're never in a sitting position when you run, you're in a 1/4 squat position during the stance phase of the running stride, that's as far down as you get when running, thus that is as far down as you should go in this exercise.

--- Towel Pull...use a thick towel on a slick surface. Place the heel of the foot on the ground, use the toes to pull the towel towards you. Progress over a few days to adding weight on the towel.

--- Calf raise [one leg at a time].....stand on one leg and push yourself up until the heel is slightly off the ground.

--- Balance "Skater Pose".....on one leg, raise other leg to the rear. Do 4 reps slowly.

## Range Of Motion [ROM's] exercises

--- See the free pdf packet.....TheETG Range Of Motion on TheETG website.



# Reminder page.....

## Just Say No to Ice & Anti-inflammatories

### Heal Faster

The primary reasons injuries often take people several weeks to several months to deal with are;

--- Providing a low or no stimulus for healing. Doing so-called "strengthening exercises" with little or no weight/resistance [ie. use of rubber tubing, etc]. The amount of weight/resistance determines the amount of stimulus for cells that are responsible for healing.

--- Doing a bunch of reps and sets of "strengthening exercises" with no progressive increase in weight/resistance as strength of the tissues increase.

--- The frequency of application of a strengthening stimulus is a major determining factor on the rate of healing. If you're seeing a physical therapist, chances are you'll be going only once or twice a week. If this is the only time that strengthening of the tissue is being induced, recovery will take quite a few weeks.

--- Multiple uses of ice, anti-inflammatories, and anything else that decreases blood flow to a healing tissue, and/or decreases immune cell function in and around a healing tissue.....will also account for a slow recovery time. Rest and stretching are usually insufficient to improve the tissue's ability to withstand training loads.

--- Recurrent attempts to return to training before the tissue has acquired the strength necessary to endure their training loads.

### Say No To Drugs

Following the initial 24-48 hour period of injury, application of heat stimulus (5 - 10 minutes limb water submersion 100-105 degrees F) should be used to increase blood flow and energy production for repair processes. Ingestion of NSAID's (anti-inflammatories) should be avoided since this will impair recovery, and potentially mask pain, leading one to believe it is ok to return to training.

Never...ever....under "any" circumstances...allow a doctor to inject the tissue with cortisone or any other substance that is well known to cause degradation of collagen and other tissue proteins.

"The use of nonsteroidal anti-inflammatory drugs for the treatment of tendon inflammation might increase the levels of leukotriene B4 within the tendon, potentially contributing to the development of tendinopathy."

"This finding is of interest because NSAID's are routinely used in clinical practice for the symptomatic treatment of tendinopathy, such as inflammation and pain."

"...the increased LTB4 level due to treatment with NSAID's could potentially exacerbate the situation by leading to neutrophilic infiltration and lymphocytic activation, paradoxically causing further inflammatory and degenerative changes in the tendon."

"...the results of this study suggest that the routine use of COX inhibitors for the symptomatic relief of inflammatory tendon conditions might inadvertently worsen the processes responsible for the development of tendinopathy."

Zhaozhu Li, et. al

Inflammatory Response Of Human Tendon Fibroblasts To Cyclic Mechanical Stretching

The American Journal Of Sports Medicine..Volume 32 #2....2004...page 435 - 439

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"Prostaglandins....potent modulators of inflammation.....inhibitors of prostaglandin synthesis known as non-steroidal anti-inflammatory drugs [NSAID's]..."

"Skeletal muscle regeneration comprises several overlapping cellular processes, including inflammation....."

"Prostaglandins may regulate muscle regeneration...."

"Prostaglandin synthesis is catalyzed by.....cyclo-oxygenase [COX], which are inhibited by anti-inflammatory drugs."

"COX-2 dependent prostaglandin synthesis is required during early stages of muscle regeneration and thus raise caution about the use of COX-2 selective inhibitors...."

### B.A.Bondesen

The COX-2 Pathway Is Essential During Early States Of Skeletal Muscle Regeneration

American Journal Of Cell Physiology.....Volume 287.....2004....C475 - 483

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iceing = cryotherapy --- just say no to cryotherapy.....

"....the administration of nonsteroidal anti-inflammatory drugs or cryotherapy are common clinical practices to control the inflammatory process following connective tissue injury. However, there are contradictory conclusions on the potential of anti-inflammatory strategies to either prevent nonspecific damages or accelerate healing after acute tendon or ligament trauma."





# Iliotibial (IT) Band Syndrome

## Mechanisms Of Injury

1. When a muscle/tendon lacks the -length-- necessary for movement through sport required range of motion....you -will- get injured
2. When a given tissue lacks the strength to endure your training loads...you -will- get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you -will- get injured

Thick sheet of tissue (fascia) that runs down the outer side of the leg from the upper hip to below the knee. The IT band is attached to the glute muscles (butt muscles) and the tensor fascia latae (small muscle on the front/outside of the hip does hip flexion motion (raises thigh).

## Increase Strength Of Involved Tissues

Start with whatever is well tolerated and progress to more aggressive effort.

## TheETG Tissue Strengthening -----

Strengthening = 4 reps with weight you can't lift more than 6 - 8 reps without stopping. Do 2 sets.

--- Hopping = on one leg, straight up and down, 1 landing is 1 rep, do 4 reps. Do 1 set.

--- 1/4 squat [one leg at a time].....going only 1/4 of the way down rather than going all the way down or halfway down. You're never in a sitting position when you run, you're in a 1/4 squat position during the stance phase of the running stride, that's as far down as you get when running, thus that is as far down as you should go in this exercise.

--- Hip Abduction exercise [leg moving out to the side, away from the midline of the body]

--- Balance "Skater Pose" .....on one leg, raise other leg to the rear. Do 4 reps slowly.

## Range Of Motion [ROM's] exercises

--- See the free pdf packet.....TheETG Range Of Motion on TheETG website.

"Two Stanford University studies suggest that weakness in the hip abductors is another factor in IT Band Syndrome. Fredericson et al first evaluated 24 runners with ITBS and found that they all had significant weakness in the hip abductors of their affected limb compared with the uninjured limb and control runners."

**M. Fredericson, C. Wolf**

**Iliotibial Band Syndrome In Runners: Innovations In Treatment**

**Sports Medicine...Volume 35 #5...2005...page 453**





# Knee Pain: Patella tendonitis

## Mechanisms Of Injury

1. When a muscle/tendon lacks the -length-- necessary for movement through sport required range of motion....you -will- get injured
2. When a given tissue lacks the strength to endure your training loads...you -will- get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you -will- get injured

## Increase Strength Of Involved Tissues

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Strengthening = 4 reps with weight you can't lift more than 6 - 8 reps without stopping. Do 2 sets.

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--- Balance "Skater Pose".....on one leg, raise other leg to the rear. Do 4 reps slowly.

## Range Of Motion [ROM's] exercises

--- See the free pdf packet.....TheETG Range Of Motion on TheETG website.

Reversing several decades of belief systems.....hip angle in female runners not the primary problem in knee issues. Faulty assumptions are the mother of all screw ups.....

".....altered femoral morphologic characteristics have been implicated in abnormal hip rotation in persons with patellofemoral pain, no study has confirmed this hypothesis."

"Participants with patellofemoral pain demonstrated significantly greater average hip internal rotation.....reduced hip-muscle strength in 8 of 10 hip strength measurements...."

"Abnormal hip kinematics in women with patellofemoral pain appears to be the result of diminished hip-muscle performance as opposed to altered femoral structure."

R.B. Souza, C.M. Powers

Predictors of Hip Internal Rotation During Running

An Evaluation of Hip Strength and Femoral Structure in Women With and Without Patellofemoral Pain

American Journal Of Sports Medicine.....Volume 37 #3.....March 2009.....page





# Hamstrings Problems

## Mechanisms Of Injury

1. When a muscle/tendon lacks the -length-- necessary for movement through sport required range of motion....you -will- get injured
2. When a given tissue lacks the strength to endure your training loads...you -will- get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you -will- get injured

## Increase Strength Of Involved Tissues

Start with whatever is well tolerated and progress to more aggressive effort.

## TheETG Tissue Strengthening -----

Strengthening = 4 reps with weight you can't lift more than 6 - 8 reps without stopping. Do 2 sets.

--- Hopping = on one leg, straight up and down, 1 landing is 1 rep, do 4 reps. Do 1 set.

--- 1/4 squat [one leg at a time].....going only 1/4 of the way down rather than going all the way down or halfway down. You're never in a sitting position when you run, you're in a 1/4 squat position during the stance phase of the running stride, that's as far down as you get when running, thus that is as far down as you should go in this exercise.

--- Calf raise [one leg at a time].....stand on one leg and push yourself up until the heel is slightly off the ground.

--- Hamstring curls [lying on your stomach, flexing the knee to curl the lower leg towards the butt] should be done in the range of motion, going from the leg straight moving toward the butt, stopping about halfway there.

--- Balance "Skater Pose".....on one leg, raise other leg to the rear. Do 4 reps slowly.

## Range Of Motion [ROM's] exercises

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# Groin Pull

## Mechanisms Of Injury

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2. When a given tissue lacks the strength to endure your training loads...you -will- get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you -will- get injured

## Increase Strength Of Involved Tissues

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--- Hip Adduction exercise [leg moving in toward the midline of the body]

--- Balance "Skater Pose".....on one leg, raise other leg to the rear. Do 4 reps slowly.

## Range Of Motion [ROM's] exercises

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# Morton's Neuralgia

## **Increase Strength Of Involved Tissues**

Start with whatever is well tolerated and progress to more aggressive effort.

### **TheETG Tissue Strengthening -----**

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--- Calf raise [one leg at a time].....stand on one leg and push yourself up until the heel is slightly off the ground.

--- plantar fasia.....put yourself in the same position as the stretch mentioned in the packet...TheETG Range Of Motion. Rather than moving your body weight back to place the toes and bottom of your forefoot on a stretch, instead flex the toes, pushing them against the ground.  
1 rep = 4 seconds. Exert as much force as can be well tolerated

--- Towel.....use a thick towel on a slick surface. Place the heel of the foot on the ground, use the toes to pull the towel towards you. Start with whatever effort is well tolerated, and progress from there. Add weight to the towel as strength increases.

### **Range Of Motion [ROM's] exercises**

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# Reminder page.....

## Just Say No to Ice & Anti-inflammatories

### Heal Faster

The primary reasons injuries often take people several weeks to several months to deal with are;

--- Providing a low or no stimulus for healing. Doing so-called "strengthening exercises" with little or no weight/resistance [ie. use of rubber tubing, etc]. The amount of weight/resistance determines the amount of stimulus for cells that are responsible for healing.

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--- The frequency of application of a strengthening stimulus is a major determining factor on the rate of healing. If you're seeing a physical therapist, chances are you'll be going only once or twice a week. If this is the only time that strengthening of the tissue is being induced, recovery will take quite a few weeks.

--- Multiple uses of ice, anti-inflammatories, and anything else that decreases blood flow to a healing tissue, and/or decreases immune cell function in and around a healing tissue.....will also account for a slow recovery time. Rest and stretching are usually insufficient to improve the tissue's ability to withstand training loads.

--- Recurrent attempts to return to training before the tissue has acquired the strength necessary to endure their training loads.

### Say No To Drugs

Following the initial 24-48 hour period of injury, application of heat stimulus (5 - 10 minutes limb water submersion 100-105 degrees F) should be used to increase blood flow and energy production for repair processes. Ingestion of NSAID's (anti-inflammatories) should be avoided since this will impair recovery, and potentially mask pain, leading one to believe it is ok to return to training.

Never...ever....under "any" circumstances...allow a doctor to inject the tissue with cortisone or any other substance that is well known to cause degradation of collagen and other tissue proteins.

"The use of nonsteroidal anti-inflammatory drugs for the treatment of tendon inflammation might increase the levels of leukotriene B4 within the tendon, potentially contributing to the development of tendinopathy."

"This finding is of interest because NSAID's are routinely used in clinical practice for the symptomatic treatment of tendinopathy, such as inflammation and pain."

"...the increased LTB4 level due to treatment with NSAID's could potentially exacerbate the situation by leading to neutrophilic infiltration and lymphocytic activation, paradoxically causing further inflammatory and degenerative changes in the tendon."

"...the results of this study suggest that the routine use of COX inhibitors for the symptomatic relief of inflammatory tendon conditions might inadvertently worsen the processes responsible for the development of tendinopathy."

Zhaozhu Li, et. al

Inflammatory Response Of Human Tendon Fibroblasts To Cyclic Mechanical Stretching

The American Journal Of Sports Medicine..Volume 32 #2....2004...page 435 - 439

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"Prostaglandins....potent modulators of inflammation.....inhibitors of prostaglandin synthesis known as non-steroidal anti-inflammatory drugs [NSAID's]..."

"Skeletal muscle regeneration comprises several overlapping cellular processes, including inflammation....."

"Prostaglandins may regulate muscle regeneration...."

"Prostaglandin synthesis is catalyzed by.....cyclo-oxygenase [COX], which are inhibited by anti-inflammatory drugs."

"COX-2 dependent prostaglandin synthesis is required during early stages of muscle regeneration and thus raise caution about the use of COX-2 selective inhibitors...."

### B.A.Bondesen

The COX-2 Pathway Is Essential During Early States Of Skeletal Muscle Regeneration

American Journal Of Cell Physiology.....Volume 287.....2004....C475 - 483

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iceing = cryotherapy --- just say no to cryotherapy.....

"....the administration of nonsteroidal anti-inflammatory drugs or cryotherapy are common clinical practices to control the inflammatory process following connective tissue injury. However, there are contradictory conclusions on the potential of anti-inflammatory strategies to

different biological processes."

D.Marsolais, et al

Inflammatory cells do not decrease the ultimate tensile strength of intact tendons in vivo and in vitro: protective role of mechanical loading  
Journal Of Applied Physiology.....Volume 102 #1.....January 2007.....page 11 - 17

".....primary research evidence only accounted for 24% of management....."

"This study highlights a lack of evidence base, a lack of knowledge of the research evidence..that is available for these conditions."

"Practitioners practiced evidence based medicine in under 50% of cases."

## How Evidence Based Is The Management Of Two Common Sports Injuries In A Sports Injury Clinic?

British Journal Of Sports Medicine..Volume 39 #12...December 2005..page 912

Robert Leach [Editor.....American Journal Of Sports Medicine]

American Journal Of Sports Medicine.....Volume 28 #3.....2000.....page 281

In the area of slow acting nutrition medicine.....high grade fish oil, vitamin D3, resveratrol, magnesium [bath in epsom ...salts], high grade Aloe Juice [<http://www.lilyofthedesert.com/>], triterpene [Flex Now Joint Forumla <http://www.flexnow.us/aboutus>].

In the area of fast acting naturopathic--homeopathy products.....anyone of a large number of research based, evidence based concentrated botanicals [turmeric, etc.]. The American Botanical Council is based here in Austin. They gather research, clinical trials, and news involving botanicals.

<http://abc.herbalgram.org/site/PageServer?pagename=Homepage>

A company called Heel is a massive distributor of homeopathy products....<http://heelusa.com/>





# Tibial "Stress Fractures" .... Stress Reactions & Shin Splints

## **TheETG Injury Repair, Healing The Tissues: Fibroblast Cells, & Osteoblast Cells -----**

Tendon is comprised of a protein called collagen. Collagen is produced by cells called fibroblasts.

Injury to the bone consists of micro breaks in the matrix structure of the tibia.

The cells responsible for healing are bone building cells called osteoblasts.

They are best activated by weight bearing activity since the movement of fluid through the bone (which is induced by weight bearing activity) is what most effectively stimulates these cells.

"Bone Remodeling" is the general term used to describe the adaptations to training that take place in bone.

There are two main players, osteoclast cells and osteoblast cells. Bone is comprised of calcium phosphate, which these cells will either breakdown or build. Following a workout, there is debris from the matrix structure of bone that must be removed. Osteoclast cells are responsible for resorbing this debris and releasing the calcium into the blood stream. Osteoblast cells are like engineers that take up calcium from the blood stream and use it to lay down a new and stronger bone matrix to withstand greater loads.

**This process is the "stress reaction" aspect of bone remodeling.  
It is a normal adaptive function within bone.**

However, when the rate of application of training stimuli exceeds the rate of adaptation, a situation exists where the rate of osteoclastic activity exceeds the rate of osteoblastic activity. Bone resorption exceeds bone deposition, thus there is a net loss of bone.

This net degeneration of bone weakens the overall integrity of the bone, and pain symptoms result.

Overtraining and psychological stress cause a decrease in production of estrogen and testosterone, which further facilitates osteoclastic activity and decreases osteoblastic activity.

**There is no true break in the bone though it is often interpreted this way on an X-ray and bone scan.**

Usually by the time an X-ray or bone scan is taken, the area of osteoblastic activity shows up as a dim white blotch. On a bone scan, the area absorbs the dye that is injected into the runner so it shows up as a "hot spot".

Unfortunately, the dye for the bone scan will be taken up in areas of stress reaction **in people who have.....no.....pain or symptoms**, thus the test is somewhat less than useful.

Misdiagnosis and treatment is extremely common.

**Repair of the bone is well underway by the time anything can show up on an X-ray or bone scan.**

Traditionally, most doctors are taught that a "stress fracture"/stress reaction takes about 6 - 8 weeks to heal. Primary healing is likely to occur far sooner than this.

### **Increase Strength Of Involved Tissues**

Start with whatever is well tolerated and progress to more aggressive effort.

Bone healing, the compressive forces created by the 1/4 squat with high weight is necessary.

### **TheETG Tissue Strengthening -----**

Strengthening = 4 reps with weight you can't lift more than 6 - 8 reps without stopping. Do 2 sets.

--- Hopping = on one leg, straight up and down, 1 landing is 1 rep, do 4 reps. Do 1 set.

--- 1/4 squat [one leg at a time].....going only 1/4 of the way down rather than going all the way down or halfway down. You're never in a sitting position when you run, you're in a 1/4 squat position during the stance phase of the running stride, that's as far down as you get when running, thus that is as far down as you should go in this exercise.

--- Calf raise [one leg at a time].....stand on one leg and push yourself up until the heel is slightly off the ground.

--- Ankle exercises [turning the heel/foot inward

Ankle inversion/supination] against high resistance, which train the muscles [tibialis posterior, tibialis anterior] that attach to the affected area of the bone, are effective. It is possible to perform these exercises and fail to sufficiently activate the specific muscle fibers that are attached to the injured tendon tissue. It may be necessary to adjust the angles of motion of the exercises accordingly.

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Ankle eversion/pronation] against high resistance, which train the muscles [tibialis anterior, peroneals] that attach to the affected area of the bone, are effective.

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It may be necessary to adjust the angles of motion of the exercises accordingly.

--- Balance "Skater Pose".....on one leg, raise other leg to the rear. Do 4 reps slowly.

### **Range Of Motion [ROM's] exercises**

--- See the free pdf packet.....TheETG Range Of Motion on TheETG website.

"The term "stress fracture" is itself somewhat of a misnomer and potentially misleading. Most of the injuries diagnosed and classified under the rubric of stress fractures show no evidence of a fracture line or break in the continuity of bone."

".....the term "stress fracture" implies a fracture, although in most cases no fracture is evident. "Stress reaction" is a more appropriate term for the majority of what are now called "stress fractures".

**B.H.Jones,et al.....1989**

**Exercise-Induced Stress Fractures And Stress Reactions Of Bone: Epidemiology, Etiology, And Classification**

**Exercise & Sport Sciences Reviews.....Volume 17.....1989....page 379 - 380**

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"Magnetic resonance imaging is more accurate in correlating the degree of bone involvement with clinical symptoms, allowing for more accurate recommendations for rehabilitation and return to impact activity."

**M. Fredericson, et al....July-August, 1995**

**Tibial Stress Reaction In Runners.**

**American Journal of Sports Medicine...Volume 23 #4...July-August 1995..page 472 - 481**

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"At 3 weeks after the start of low-intensity ultrasound, the stress fracture responded well and the patient was allowed use of tumble track, trampoline, and to do some weight-bearing activities, such as jumping in the pool and loading-type activities. At 4.5 wk, the patient progressed to full workout activities and participated in a trial meet for the Olympics. At 6 wk, the patient's participation in the women's gymnastic team event was a factor in the United States receiving a gold medal."

**J.E.Jensen**

**Stress Fracture In The World Class Athlete: A Case Study**

**Medicine & Science in Sports & Exercise.....Volume 30 #6.....June 1998.....page 783 - 787**

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"We understand the clinical implications of conditions such as tendinosis and stress fractures and can make the diagnosis, but we treat them imperfectly."

**Robert Leach MD**

**Editor.....American Journal Of Sports Medicine**

**Volume 28 #3.....2000.....page 281**

"The repair and maintenance of connective tissues is performed predominately by.....cell known as a fibroblast. The activity of this cell is regulated, in part, by changes in the mechanical environment in which it resides."

**M. Eastwood, D.A., McGrouther, R.A. Brown.....1998**

**Fibroblast Responses To Mechanical Forces**

**Journal of Engineering in Medicine.....Volume 212 #2.....1998.....page 85 - 92**

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".....the proliferation and activation of tendon fibroblasts is dependent upon the mechanical force applied...."

"Improved fibroblast response may lead to improved tensile strength of the healing tissue and identifying the optimal pressure to facilitate this response may lead to fewer treatment sessions."

**G.M.Gehlsen, L.R.Ganion, R.Helfst.....1999**

**Fibroblast Responses To Variation In Soft Tissue Mobilization Pressure**

**Medicine & Science In Sports & Exercise.....Volume 31 #4 1999**

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"This study shows that application of mechanical stress to tendon fibroblasts resulted in an alteration of cellular proliferation depending on the stress time."

**J. Zeichen, M.van Griensven, U. Bosch.....2000**

**The Proliferative Response Of Isolated Human Tendon Fibroblasts To Cyclic Biaxial Mechanical Strain**

**American Journal Of Sports Medicine.Volume 28 #6.....November/December 2000..page 888 - 892**

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"Mechanical stress is an important regulator of bone metabolism. Fluid shear stress caused by mechanical load in bone tissue has been shown to be important.....through its effects on osteocytes and osteoblasts."

**K.Sakai, M.Mohtai, Y.Iwamoto**

**Fluid Shear Stress Increases Transforming Growth Factor Beta 1 Expression In Human Osteoblast-Like Cells: Modulation By Cation Channel Blockades**

**Calcified Tissue International.....Volume 63 #6.....December 1998.....page 515 - 520**

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".....bone adapts to imposed stress or lack of stress by forming or losing tissue."

"Remodeling is performed by individual, independent bone remodeling units which comprise bone-resorbing osteoclasts and bone-forming osteoblasts."

"Osteoblastic activity exceeds osteoclastic resorption, which leads to a net gain in bone. Net loss occurs when resorption is greater than formation."

"Osteoclastic activity removes the damaged material so that osteoblasts can deposit matrix and mineral along the paths of imposed stress."

"....exercise such as weight training, in which load is increased, would be more effective in improving bone mass than would jogging, in which repetitions are the primary training stimulus."

**C.Snow-Harter, R.Marcus**

**Exercise, Bone Mineral Density, And Osteoporosis**

**Exercise & Sport Sciences Reviews.....Volume 19....1991....page 352 - 354**





# Ankle Sprain

## Mechanisms Of Injury

1. When a muscle/tendon lacks the -length-- necessary for movement through sport required range of motion....you -will- get injured
2. When a given tissue lacks the strength to endure your training loads...you -will- get injured.
3. When the rate of application of your training loads exceeds the body's rate of adaptation.....you -will- get injured

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Start with whatever is well tolerated and progress to more aggressive effort.

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# Think “Tissue Regeneration”

Regardless of what athletes are told by an orthopedist, all tissues in and around the knee and shoulder can be healed through loading.

There are zero exceptions.

Almost all non-tissue regeneration oriented surgeries are no more effective than placebo surgery. And surgery can result in no change in pain symptoms. Once someone cuts into these joints you're all but guaranteed to be on the path to degenerative issues years down the road.

People are quite willing to engage in months of rehab exercises after various types of surgery, but quite un-willing to try that on the front-end, instead of surgery.

Damaged tissue....If you load it, healing will come.

Especially if you avoid ice, anti-inflammatories, and any other traditional approach that suppresses cells that heal damaged tissue.

A video showing you what happens with Placebo Surgery compared to real surgery.....

<http://www.youtube.com/watch?v=zwXokKJ7hss>

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# Tissue Healing & Repair

"The repair and maintenance of connective tissues is performed predominately by.....cell known as a fibroblast. The activity of this cell is regulated, in part, by changes in the mechanical environment in which it resides."

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**The Proliferative Response Of Isolated Human Tendon Fibroblasts To Cyclic Biaxial Mechanical Strain**

**American Journal Of Sports Medicine.Volume 28 #6.....November/December 2000..page 888 - 892**

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".....in healing tendons the effect of mechanical loading, or its absence, is dramatic."

"Many studies show that tendons adapt to mechanical loading.....the healing of injured tendons comprises rapid proliferation and remodeling, and here the effects of mechanical loading is dramatic. Numerous animal studies show that immobilization of a healing tendon compromises the healing process."

"Patients with Achillies tendon injuries often have the injured limb immobilized for several weeks. Because animal data suggest that this impairs healing so much, it is important to develop clinical loading regimes during healing."

".....patients might be allowed early short loading episodes following for example, an Achillies tendon rupture, for a better outcome

**T. Andersson, et al**

**Tissue Memory In Healing Tendons:Short Loading Episodes Stimulate Healing**

**Journal Of Applied Physiology.....Volume 107 #2.....August 2009.....page 417**



# Problems With Being Diagnosed Based On An MRI.....

**"Asymptomatic"** means, you have no symptoms, no pain, no problems.

An MRI showing damage to a knee meniscus, lower back disc, shoulder rotator cuff, etc may not mean what the doctor says it does. Is the damage you see on the MRI the actual cause/source of the pain. Faulty assumptions are the mother of all screw-ups.

The test = MRI magnetic resonance imaging

Treat the patient, not the test.....

"26% true-positive results.....74% false-positive results"

"Of the 45 patients who did not undergo arthroscopic surgery, 6 had isolated anterior horn tears reported on magnetic resonance imaging, and 5 of the 6 were asymptomatic at follow up."

"...without clinical correlation, reliance on MRI to diagnose meniscal injuries could lead to unnecessary operations.....meniscal tears may be asymptomatic, and the presence of a tear does not necessarily account for a patient's symptoms."

**M.F. Shepard, et al**

**The Clinical Significance Of Anterior Horn Meniscal Tears Diagnosed On Magnetic Resonance Images  
American Journal Of Sports Medicine.....Volume 30 #2...2002**  
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"Spinal magnetic resonance imaging often reveals alarming but clinically irrelevant findings, and adults with back pain who receive magnetic resonance imaging results may experience worse dysfunction than those not given the results."

"....."medicalizing" normal phenomena are as harmful as unrealistic expectations and are fostered frequently by marketing hype...."

**Exploring the Harmful Effects of Health Care**

**C.M. Kilo, E.B. Larson**

**Journal Of The American Medical Association.....Volume 302 #1.....July 1, 2009.....page 89 - 91**  
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"Some clinicians do lumbar imaging routinely or in the absence of historical or clinical features suggestive of serious low-back problems."

"We investigated immediate lumbar imaging versus usual clinical care....on clinical outcome...."

"Lumbar imaging for low-back pain without indications of serious underlying conditions does not improve clinical outcomes."

"Therefore, clinicians should refrain from routine, immediate lumbar imaging..."

**R.Chou, et al**

**Imaging strategies for low-back pain: systematic review and meta-analysis  
The Lancet....Volume 373 #9662.....February 7, 2009.....pages 463 - 472**  
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**A. Ong, et al**  
**A Pilot Study The Prevalence Of Lumbar Disc Degeneration In Elite Athletes With Lower Back Pain At**  
**The Sydney 2000 Olympic Games**  
**British Journal Of Sports Medicine....Volume 37...2003...page 263**

**A.Miniaci, et al**  
**Magnetic Resonance Imaging Of The Shoulder In Asymptomatic Professional Baseball Pitchers**  
**American Journal Of Sports Medicine.....Volume 30 #1....2002....66**

L.K.Y. Lo, et al  
Matrix Metaloproteinase And Tissue Inhibitor Of Matrix Metaloproteinase mRNA Levels Are Specifically  
Altered In Torn Rotator Cuff Tendons  
American Journal Of Sports Medicine.....Volume 32 #5.....2004.....page 1223



# **Stay ahead of tissue strength needs**

If the level of tissue strength necessary to endure your training loads exceeds what your tissues have, the **tissues that are the weakest link in the chain** may require you to improve the **effectiveness of your strengthening protocols** or reconsider the design of your training program.

Since the 1960's and 1970's, the first and ultimate "minimalist" running shoes have been racing flats.

Expensive cushioning, arch support, and motion control shoes.....Whether the subject is everyday walking and standing, or running shoes, don't be putting stuff on your feet for decade after decade of life on this planet, that do things -for- your muscles and soft tissues that they really do need to be doing for themselves.

**A bridge that isn't strong enough to hold the cars that cross it, will cause somebody to get wet. The solution isn't to reduce the number of cars on the bridge but to increase the strength of the bridge to a level that can endure the loads placed on it.**

**Likewise, muscles and soft tissues that aren't strong enough to endure the loads you place on them or the activities you put them through, will breakdown or tear, or in some other way fail to function.**

Don't allow decades of atrophy then start in with the rhetoric of "I can't run because of my knees" or something about your age or aging.

**The quackery of Traditional --sports-- medicine:  
Another example of what that looks like.**

back surgery -vs- no back surgery...

"To determine the performance-based outcomes in professional National Hockey League athletes with a lumbar disc herniation after either nonsurgical or surgical treatment."

"A total of 87 NHL players met the inclusion criteria; 31 underwent nonoperative care, 48 underwent a discectomy, and 8 underwent a single-level fusion."

"A comparison of the posttreatment results for the nonsurgical and surgical patient groups revealed no significant difference in performance measures."

**G.D. Schroeder**

**Performance-Based Outcomes After Nonoperative Treatment, Discectomy, and/or Fusion for a Lumbar Disc Herniation in National Hockey League Athletes  
American Of Sports Medicine.....Volume 41 #11....November 2013...page 2604 - 2608**

**The quackery of Traditional --sports-- medicine:  
Another example of what that looks like.**

achillies tendon surgery -vs- no achillies tendon surgery...

"A total of 100 patients [86 men, 14 women; mean age, 40 years] with an acute total Achilles tendon rupture were randomized to either surgical treatment, including an accelerated rehabilitation protocol, or nonsurgical treatment."

"There were no significant differences between the groups in terms of symptoms, physical activity level, or quality of life."

"There were 6 superficial infections in the surgically treated group.."

"The results of the present study demonstrate that stable surgical repair..this treatment was not significantly superior to nonsurgical treatment in terms of functional results, physical activity, or quality of life."

**N.Olsson, et al**

**Stable Surgical Repair With Accelerated Rehabilitation Versus Nonsurgical Treatment for Acute Achilles Tendon Ruptures  
A Randomized Controlled Study  
American Of Sports Medicine.....Volume 41 #12....December 2013...page 2604 - 2608**

## The quackery of traditional sports medicine.....

“There are many myths in modern medicine. Myths are good stories that are easy to remember, and when they include a mechanical explanation for changes in pain that make intuitive sense, they catch on and live for a long time.”

“One such story is that meniscal tears cause pain, which can be relieved by removal of the damaged meniscal tissue. This myth has been ‘busted’ by randomised, double-blinded trials in middle-aged and older patients demonstrating knee arthroscopy to be no better for degenerative meniscal tears than placebo surgery. But why does knee arthroscopy provide no better pain relief than placebo surgery?”

“The rationale for cutting away damaged meniscal tissue is based on the premise that the injured or damaged parts of the meniscus are the primary cause of the patient’s pain and discomfort.”

“More likely, the knee pain is explained by the presence of early degenerative changes (including degenerative meniscal tissue) or established osteoarthritis in the knee and not because of a direct link between pain and meniscal damage per se. Meniscal tears are common in the symptom-free general middle-aged and older population with and without signs of radiographic knee osteoarthritis.”

“Similarly, in patients with knee trauma, meniscal tears are frequently seen in the uninjured contralateral leg. Such studies debunk the explanation that meniscal tears always cause pain; the simple ‘car mechanic’ analogy—cutting tissue away—does not apply.”

**J.B.Thorlund**

**Deconstructing a popular myth: why knee arthroscopy is no better than placebo surgery for degenerative meniscal tears**  
**British Journal Of Sports Medicine – Volume 51 #22 – November 2017**

## **Not lite, --heavy-- weights for knee pain and everything else Applied sports medicine.....**

"Heavy slow resistance training is effective in the management of patellar tendinopathy, but the underlying functional mechanisms remain elusive."

"Purpose --- To investigate fibril morphology and mechanical properties in patellar tendinopathy and the effect of Heavy slow resistance training on these properties."

"Eight male patients with patellar tendinopathy completed 12 weeks of Heavy slow resistance training....."

"Tendon biopsy samples were analyzed for fibril density, volume fraction, and mean fibril area. Tendon mechanical properties were assessed using force and ultrasonography samplings."

"Patients improved in symptoms/function and maximal tendon pain during activity."

".....fibril density **increased 70%**.....in tendinopathic tendons after Heavy slow resistance training."

"Clinical improvements after Heavy slow resistance training were associated with **changes in fibril morphology toward normal fibril density** and mean fibril area. Heavy slow resistance training improved the clinical outcome of patellar tendinopathy, and these improvements were associated with normalization of fibril morphology, most likely due to a production of new fibrils."

M.Kongsgaard, et al

Fibril Morphology and Tendon Mechanical Properties in Patellar

Tendinopathy: Effects of Heavy Slow Resistance Training

American Journal Of Sports Medicine -- Volume 38 #4 -- April 2010 -- page 749 - 756



# Just say no to Ice and other forms of cryotherapy

In sport, in post-workout or post-injury, swelling/inflammation is -not- your enemy, and ice is -not- your friend.

Just say no to ice baths and other forms of "cryotherapy". Been against this stuff since I saw the first studies on it in the late 1980's when one of my former high school runners was at University Of Texas where the women's track program was using it. Its now an obsession across many sports, especially college and pro football. Whether its application of an ice pack, bag of ice, pack of frozen vegetables, or a full scale limb or body submersion in an ice bath.....contrary to popular belief, swelling and inflammation is -not- your enemy.

The immune system drives workout "recovery" processes. Doing stuff that screws with that makes no sense.

Doing stuff that shuts down local anabolic [tissue building and repair] substances and hormones makes no sense.

Doing stuff that impairs recovery and/or adaptations to training and then saying that it improves same, makes no sense.

The human species didn't appear on earth yesterday afternoon. We know something about how human cells function.

Don't be do'in this crap for years, sabotaging your own advancement in your sport, and then claim that the reason you decided to take steroids is because that was your only way forward. Be a jock -not- a dumb jock.

Follow the data, not the crowd.

"We evaluated the effect of cold ice-pack application following a brief sprint-interval training on the balance between anabolic mediators [growth hormone, insulin-like growth factor-I, testosterone], catabolic markers (cortisol, IGFBP-1, and circulating pro [Interleukin-6 and IL-1 $\beta$ ]- and anti-inflammatory cytokines [IL-1 receptor antagonist]."

"Twelve males, elite junior handball players performed 4 × 250 m treadmill run, at 80% of each individual's maximal speed, followed by a rest period with and without local cold-pack application."

"Local cold-pack application was associated with significant decreases in IL-1 $\beta$ , IL-1ra, IGF-I, and IGFBP-3 and a greater increase of IGFBP-1 during recovery."

"Local ice therapy immediately following sprint-interval training was associated with greater decreases....anabolic hormones supporting some clinical evidence for possible negative effects on athletic performance."

**D.Nemet, et al**

**Effect of local cold-pack application on systemic anabolic and inflammatory response to sprint-interval training: a prospective comparative trial**

**European Journal of Applied Physiology....Volume 107 #4....November 2009....page 411 - 417**

"Several studies analyzed the effectiveness of cold-water immersion to support recovery after strenuous exercise, but the overall results seem to be conflicting. Most of these studies analyzed only short-term recovery effects, whereas the adaptational aspect has been widely neglected."

"Therefore, we analyzed the effects of repeated cooling after training sessions on adaptations to strength training."

"Cooling consisted of 3...4-minute intervals with a 30-second rest period." The other leg was not cooled."

"Long-term strength training adaptations in trained subjects can be negatively affected by cold-water immersion. However, effects were small, and the practical relevance relative to possible recovery effects needs to be considered in a sports practical setting."

**M.Fröhlich, et al**

**Strength Training Adaptations After Cold-Water Immersion**

**Journal Of Strength & Conditioning Research....Volume 28 #9...September 2014...page 2628 – 2633**

"When ice is applied to a body part for a prolonged period, nearby lymphatic vessels begin to dramatically increase their permeability (lymphatic vessels are 'dead-end' tubes which ordinarily help carry excess tissue fluids back into the cardiovascular system)."

"As lymphatic permeability is enhanced, large amounts of fluid begin to pour from the lymphatics 'in the wrong direction' (into the injured area), increasing the amount of local swelling and pressure and potentially contributing to greater pain."

**The use of Cryotherapy in Sports Injuries.....Sports Medicine....Volume 3.....1986....page 398 – 414**

"The use of ice or cryotherapy in the management of acute soft tissue injuries is widely accepted and widely practiced. This review was conducted to examine the medical literature to investigate if there is evidence to support an improvement in clinical outcome following the use of ice or cryotherapy."

"Six relevant trials in humans were identified, four of which lacked randomization and blinding. There were two well conducted randomized controlled trials, one showing supportive evidence for the use of a cooling gel and the other not reaching statistical significance."

"Four animal studies showed that modest cooling reduced edema but excessive or prolonged cooling is damaging. There were two systematic reviews, one of which was inconclusive and the other suggested that ice may hasten return to participation."

"There is insufficient evidence to suggest that cryotherapy improves clinical outcome in the management of soft tissue injuries."

**Is Ice Right? Does Cryotherapy Improve Outcome for Acute Soft Tissue Injury?**

**Journal of Emergency Medicine....February 25, 2008.....page 65 - 68**

"....cold water immersion is widely used by athletes for recovery. This study examined the physiological merit of cold water immersion for recovery from high-intensity exercise by investigating if the placebo effect is responsible for any acute performance or psychological benefits."

"30 males performed an acute high-intensity interval training session, comprised of 4 × 30-seconds sprints, immediately followed by one of the following three 15-min recovery conditions: cold water immersion(10.3°C), thermoneutral water immersion placebo (34.7°C), or thermoneutral water immersion control (34.7°C)."

"**A recovery placebo** administered after an acute high-intensity interval training session....**is as effective** as cold water immersion. This can be attributed to improved ratings of readiness for exercise, pain, and vigor, suggesting that the commonly hypothesized physiological benefits surrounding cold water immersion are at least partly placebo related."

J.R.Broatch, A.Petersen, D.J.Bishop

Postexercise Cold Water Immersion Benefits Are Not Greater than the Placebo Effect

Medicine & Science in Sports & Exercise -- Volume 46 #11 -- November 2014 -- page 2139

# Reminder page.....Just Say No to Ice & Anti-inflammatories

## Heal Faster

The primary reasons injuries often take people several weeks to several months to deal with are;

--- Providing a low or no stimulus for healing. Doing so-called "strengthening exercises" with little or no weight/resistance [ie. use of rubber tubing, etc].

The amount of weight/resistance determines the amount of stimulus for cells that are responsible for healing.

--- Doing a bunch of reps and sets of "strengthening exercises" with no progressive increase in weight/resistance as strength of the tissues increase.

--- The frequency of application of a strengthening stimulus is a major determining factor on the rate of healing. If you're seeing a physical therapist, chances are you'll be going only once or twice a week. If this is the only time that strengthening of the tissue is being induced, recovery will take quite a few weeks.

--- Multiple uses of ice, anti-inflammatories, and anything else that decreases blood flow to a healing tissue, and/or decreases immune cell function in and around a healing tissue.....will also account for a slow recovery time. Rest and stretching are usually insufficient to improve the tissue's ability to withstand training loads.

--- Recurrent attempts to return to training before the tissue has acquired the strength necessary to endure their training loads.

## Say No To Drugs

Following the initial 24-48 hour period of injury, application of heat stimulus (5 - 10 minutes limb water submersion 100-105 degrees F) should be used to increase blood flow and energy production for repair processes. Ingestion of NSAID's (anti-inflammatories) should be avoided since this will impair recovery, and potentially mask pain, leading one to believe it is ok to return to training.

Never...ever....under "any" circumstances...allow a doctor to inject the tissue with cortisone or any other substance that is well known to cause degradation of collagen and other tissue proteins.

"The use of nonsteroidal anti-inflammatory drugs for the treatment of tendon inflammation might increase the levels of leukotriene B4 within the tendon, potentially contributing to the development of tendinopathy."

"This finding is of interest because NSAID's are routinely used in clinical practice for the symptomatic treatment of tendinopathy, such as inflammation and pain."

"..the increased LTB4 level due to treatment with NSAID's could potentially exacerbate the situation by leading to neutrophilic infiltration and lymphocytic activation, paradoxically causing further inflammatory and degenerative changes in the tendon."

"..the results of this study suggest that the routine use of COX inhibitors for the symptomatic relief of inflammatory tendon conditions might inadvertently worsen the processes responsible for the development of tendinopathy."

Zhaozhu Li, et. al

Inflammatory Response Of Human Tendon Fibroblasts To Cyclic Mechanical Stretching

The American Journal Of Sports Medicine..Volume 32 #2....2004...page 435 - 439

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"Prostaglandins....potent modulators of inflammation.....inhibitors of prostaglandin synthesis known as non-steroidal anti-inflammatory drugs [NSAID's]..."

"Skeletal muscle regeneration comprises several overlapping cellular processes, including inflammation....."

"Prostaglandins may regulate muscle regeneration...."

"Prostaglandin synthesis is catalyzed by.....cyclo-oxygenase [COX], which are inhibited by anti-inflammatory drugs."

"COX-2 dependent prostaglandin synthesis is required during early stages of muscle regeneration and thus raise caution about the use of COX-2 selective inhibitors...."

B.A.Bondesen

The COX-2 Pathway Is Essential During Early States Of Skeletal Muscle Regeneration

American Journal Of Cell Physiology.....Volume 287.....2004....C475 - 483

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iceing = cryotherapy --- just say no to cryotherapy.....

"....the administration of nonsteroidal anti-inflammatory drugs or cryotherapy are common clinical practices to control the inflammatory process following connective tissue injury. However, there are contradictory conclusions on the potential of anti-inflammatory strategies to either prevent nonspecific damages or accelerate healing after acute tendon or ligament trauma."

"Cumulative evidences also show that, apart from releasing catabolic enzymes, inflammatory cells can ultimately favor tissue healing through different biological processes."

"Indeed, after the clearance of pathogens and other signals of danger, neutrophils will undergo apoptosis and be engulfed by phagocytic macrophages. Macrophages will then release growth factors that can stimulate fibroblast proliferation, collagen synthesis, and angiogenesis during the early phase of healing."

D.Marsolais, et al

Inflammatory cells do not decrease the ultimate tensile strength of intact tendons in vivo and in vitro: protective role of mechanical loading

Journal Of Applied Physiology.....Volume 102 #1.....January 2007.....page 11 - 17

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Just say no to practitioners of traditional Sports Medicine...

".....primary research evidence only accounted for 24% of management....."

"Practitioners were unaware of literature supporting over 50% of the treatment modalities they used."

"This study highlights a lack of evidence base, a lack of knowledge of the research evidence..that is available for these conditions."

"Practitioners practiced evidence based medicine in under 50% of cases."

I.R. Murray, et al

How Evidence Based Is The Management Of Two Common Sports Injuries In A Sports Injury Clinic?

British Journal Of Sports Medicine..Volume 39 #12...December 2005..page 912

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"We understand the clinical implications of conditions such as tendinosis and stress fractures and can make the diagnosis, but we treat them imperfectly.

Robert Leach [Editor.....American Journal Of Sports Medicine]

American Journal Of Sports Medicine.....Volume 28 #3.....2000.....page 281

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There is a long list of naturopathic--homeopathy products, a longer list of nutrition medicine products that work a bit slower.

In the area of slow acting nutrition medicine.....high grade fish oil, vitamin D3, resveratrol, magnesium [bath in epsom ...salts], high grade Aloe Juice [<http://www.lilyofthedesert.com/>], triterpene [Flex Now Joint Formula <http://www.flexnow.us/aboutus>].

In the area of fast acting naturopathic--homeopathy products.....anyone of a large number of research based, evidence based concentrated botanicals [turmeric, etc.]. The American Botanical Council is based here in Austin. They gather research, clinical trials, and news involving botanicals. <http://abc.herbalgram.org/site/PageServer?pagename=Homepage>

A company called Heel is a massive distributor of homeopathy products....<http://heelusa.com/>

"When ice is applied to a body part for a prolonged period, nearby lymphatic vessels begin to dramatically increase their permeability (lymphatic vessels are 'dead-end' tubes which ordinarily help carry excess tissue fluids back into the cardiovascular system)."

"As lymphatic permeability is enhanced, large amounts of fluid begin to pour from the lymphatics 'in the wrong direction' (into the injured area), increasing the amount of local swelling and pressure and potentially contributing to greater pain."

**The use of Cryotherapy in Sports Injuries**  
**Sports Medicine....Volume 3.....1986....page 398 – 414**

"The use of ice or cryotherapy in the management of acute soft tissue injuries is widely accepted and widely practiced. This review was conducted to examine the medical literature to investigate if there is evidence to support an improvement in clinical outcome following the use of ice or cryotherapy."

"Six relevant trials in humans were identified, four of which lacked randomization and blinding. There were two well conducted randomized controlled trials, one showing supportive evidence for the use of a cooling gel and the other not reaching statistical significance."

"Four animal studies showed that modest cooling reduced edema but excessive or prolonged cooling is damaging. There were two systematic reviews, one of which was inconclusive and the other suggested that ice may hasten return to participation."

"There is insufficient evidence to suggest that cryotherapy improves clinical outcome in the management of soft tissue injuries."

**Is Ice Right? Does Cryotherapy Improve Outcome for Acute Soft Tissue Injury?**  
**Journal of Emergency Medicine....February 25, 2008.....page 65 - 68**

# surgery --vs-- no surgery....

"The optimal treatment for acute Achilles tendon ruptures is still a subject of debate."

"A total of 100 patients (86 men, 14 women; mean age, 40 years) with an acute total Achilles tendon rupture were randomized to either surgical treatment, including an accelerated rehabilitation protocol, or nonsurgical treatment."

"There were no significant differences between the groups in terms of symptoms, physical activity level, or quality of life."

".....this treatment was not significantly superior to nonsurgical treatment in terms of functional results, physical activity, or quality of life."

**N.Olsson**

**Stable Surgical Repair With Accelerated Rehabilitation Versus Nonsurgical Treatment for Acute Achilles Tendon Ruptures**  
**American Of Sports Medicine.....Volume 41 #12....December 2013...page 2604 - 2608**

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Removal of portions of the knee meniscus is standard surgery in Traditional Sports Medicine.  
Doing so is strongly associated with developing osteo-arthritis.

"It is still debated whether a degenerative horizontal tear of the medial meniscus should be treated with surgery."

"A total of 102 patients with knee pain and a degenerative horizontal tear of the posterior horn of the medial meniscus...."

"Fifty patients underwent arthroscopic meniscectomy, and 52 patients underwent nonoperative treatment with strengthening exercises."

"Functional outcomes were compared....."

"In terms of clinical outcomes, meniscectomy did not provide better functional improvement than nonoperative treatment."

**J.H.Yim, et al**

**A Comparative Study of Meniscectomy and Nonoperative Treatment for Degenerative Horizontal Tears of the Medial Meniscus**  
**American Journal Of Sports Medicine.....volume 41 #7.....July 2013.....page 1565 - 1570**

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"Ice hockey players have a high incidence of lumbar spine disorders; however, there is no evidence in the literature to guide the treatment of an ice hockey player with a herniated lumbar disc."

"To determine the performance-based outcomes in professional National Hockey League (NHL) athletes with a lumbar disc herniation after either nonsurgical or surgical treatment."

"Athletes in the NHL with a lumbar disc herniation were identified through team injury reports and archives on public record."

"A total of 87 NHL players met the inclusion criteria; 31 underwent nonoperative care, 48 underwent a discectomy, and 8 underwent a single-level fusion."

"A comparison of the posttreatment results for the nonsurgical and surgical patient groups revealed no significant difference in performance measures."

"National Hockey League players with a lumbar disc herniation have a high return-to-play rate regardless of the type of treatment...."

**G.D. Schroeder, et al**

**Performance-Based Outcomes After Nonoperative Treatment, Discectomy, and/or Fusion for a Lumbar Disc Herniation in National Hockey League Athletes**  
**American Of Sports Medicine.....Volume 41 #11....November 2013...page 2604 - 2608**

My FDA warning of the week.....

On December 19, 2017, FDA announced that it is requiring a new class warning and other safety measures for all gadolinium-based **contrast agents for magnetic resonance imaging (or MRI) concerning gadolinium remaining in patients' bodies, including the brain, for months to years** after receiving these drugs."

....after review and consultation with the Medical Imaging Drugs Advisory Committee, we are requiring several actions to alert health care professionals and patients about gadolinium retention after an MRI using a gadolinium-based contrast agent. These include requiring a patient Medication Guide that every patient will be asked to read before receiving a gadolinium-based contrast agent. We are also requiring manufacturers of gadolinium-based contrast agents to conduct human and animal studies to further assess the safety of these agents."

"Gadolinium-based contrast agents are used with MRIs and contain gadolinium, a heavy metal. They are injected into a vein to improve visualization of internal organs, blood vessels, and tissues during an MRI."

"The term stress fracture itself is somewhat of a misnomer and potentially misleading. Most of the injuries diagnosed and classified under the rubric of stress fractures show no evidence of a fracture line or break in the continuity of bone."

"The continued use of the term "stress fracture" to describe a broad range of bone pathology, from asymptomatic lesions evident only on bone scan to exquisitely painful lesions with simultaneous radiographic evidence of fracture and remodeling bone, has led to confusion in regard to both the incidence and the etiology of these reactions of bone to unaccustomed stress."

"....the term stress fracture implies a fracture, although in most cases no fracture is evident. "Stress reaction" is a more appropriate term for the majority of what are now called stress fractures....."

**B.H.Jones, et al**

**Exercise-Induced Stress Fractures And Stress Reactions of Bone: Epidemiology, Etiology, and Classification**

**Exercise And Sport Sciences Reviews....Volume 17....1989....page 379 - 380**



# effect of minimalist footwear.....

"The purpose of this study is to compare changes in plantar pressure and force using conventional running shoes and minimalist footwear pre and post a 4-week minimalist footwear familiarization period."

"Ten female runners (age:  $21 \pm 2$  years; stature:  $165.8 \pm 4.5$  cm; mass:  $55.9 \pm 3.2$  kg)....."

"During the pretests, 30% of subjects adopted a forefoot strike in minimalist footwear, following familiarization this increased to 80%; no change occurred in conventional running shoes."

".....a significant decrease in heel pressures in minimalist footwear...."

J.P.Warne, et al

A 4-week instructed minimalist running transition and gait-retraining changes plantar pressure and force  
Scandinavian Journal of Medicine & Science in Sports.....Volume 24 #6.....December 2014.....page 964 – 973

# Anterior cruciate ligament [ACL] injury. Its the hamstrings not the quads.

"....increased hamstring muscle force could dynamically substitute for the ACL during stressful activities."

"The hamstring muscles are believed to play an important role in the control of anterior tibia displacement."

".....reductions in anterior displacement of the tibia depended on hamstring muscle load with larger hamstring loads resulting in large posterior tibia shifts. It was concluded that **hamstring muscle coactivation provides a synergistic action to the ACL** by preventing excessive anterior tibia displacement."

L.R. Osternig, et al

Human Hip And Knee Torque Accommodations To Anterior Cruciate Ligament Dysfunction

European Journal Of Applied Physiology.....Volume 83.....2000.....page 71 - 76

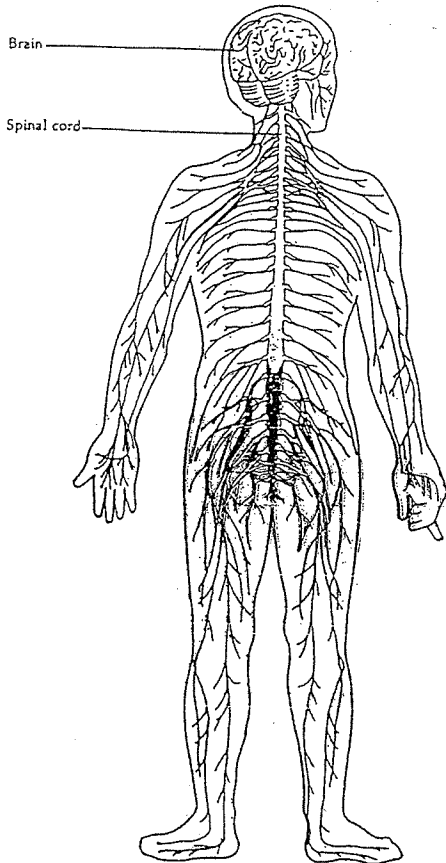
"Girls with lower hamstring strength displayed significantly greater knee abduction alignment, reduced hip abduction moments, and greater ACL loading at the time of the peak anteroposterior ground reaction forces compared with their stronger counterparts."

"Girls with reduced hamstring strength appear to have a decreased capacity to control lower limb frontal plane alignment. This reduced capacity appears to contribute to increased ACL loading and, in turn, increased potential for injury."

C.Y. Wild, et al

Insufficient Hamstring Strength Compromises Landing Technique in Adolescent Girls

Medicine & Science In Sports & Exercise.....Volume 45 #3....March 2013....page 497 - 505

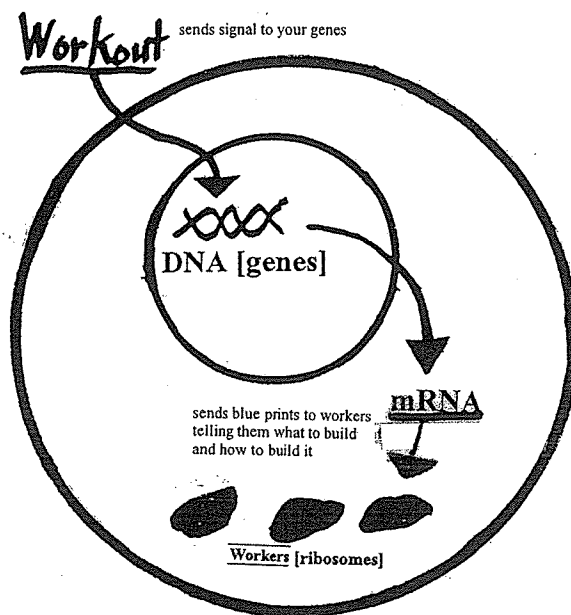


### The Human Body Is A Construction Site

- blue prints & instructions of what to build
- building materials
- maintenance & repair

**E\*F\*G**

**Train The Brain**



### Facts

- 1 - workout
- 2 - build new parts of cells and/or new cells

### Questions

- 1 - what needs to be built
- 2 - what workout design causes this

**“Nature.....to be commanded,  
must be obeyed.”**

Francis Bacon

## So called "performance enhancing drugs" are prescription drugs.

### Some examples of the effectiveness of prescription drugs in sport.....

"The drug erythropoietin, often called EPO.....a new systemic review of existing research reveals that **there is no scientific evidence that it does enhance performance**, but there is evidence that using it in sport could place a user's health and life at risk."  
EPO [erythropoietin] doping in elite cycling: No evidence of benefit, but risk of harm  
Science Daily.....December 5, 2012.

"....**there is no scientific basis from which to conclude that rHuEPO has performance-enhancing properties** in elite cyclists." "The use of rHuEPO in cycling is rife but scientifically unsupported by evidence, and its use in sports is medical malpractice."  
J.A.Heuberger, et al  
Erythropoietin doping in cycling: lack of evidence for efficacy and a negative risk-benefit.  
British Journal Of Clinical Pharmacology.....Volume 75 #6.....June 2013...page 1406

"The **over-exaggeration of the effects of growth hormone** in muscle building is effectively promoting its abuse...."  
"....there is the question of disinformation on rhGH....Part of this problem may, paradoxically, derive from the anti-doping authorities themselves. By ignoring the evidence the **rhGH does not work** in normal healthy subjects, the athletic establishment could be accused of effectively promoting its use."  
**"We must tell athletes the truth: growth hormone does not 'work'** or at least not as they think it does and that its is associated with all kinds of immediate and long term hazards-----everything from decreased performance to cancer."  
"....none of us scientists, doctors, coaches, or sports bodies should continue to suggest that this dangerous doping practice works."  
M.J. Rennie  
British Journal Of Sports Medicine.....Volume 37 #2....April 2003....pages 100-103

"**Testosterone prohormones** such as androstenedione, androstenediol, and dehydroepiandrosterone (DHEA) have been heavily marketed as testosterone-enhancing and muscle-building nutritional supplements for the past decade."  
"Contrary to marketing claims, research to date indicates that the use of prohormone nutritional supplements (DHEA, androstenedione, androstenediol, and other steroid hormone supplements) **does not produce either anabolic or ergogenic** effects in men. Moreover, the use of prohormone nutritional supplements may raise the risk for negative health consequences."  
G.A.Brown, et al  
Testosterone Prohormone Supplements.  
Medicine & Science in Sports & Exercise.....Volume 38 #8....August 2006.....pg 1367-1537

## So called "performance enhancing drugs" are prescription drugs.

### Some examples of the effectiveness of prescription drugs in American medicine & health care.....

"Most drugs are only effective **for a small percentage** of people who take them."  
Michael Leavitt [U.S. Secretary of Health & Human Services 2005 - 2009]

".....the benefits that US health care currently deliver **may not outweigh the aggregate health harm** it imparts."  
Journal Of The American Medical Association...Volume 302 #1..July 1, 2009...page 89 - 91

"It is estimated that more than 700,000 individuals are seen in hospital emergency departments for adverse drug events each year in the United States."  
[Centers For Disease Control.....2015]

"106,000 deaths/year **from non-error**, adverse effects of medications"  
B. Starfield  
Is US Health Really the Best in the World  
Journal of The American Medical Association.....Volume 284 #4....July 26, 2000....page 483 - 485

".....1.5 million U.S. residents are harmed or killed each year because of medication errors, according to an Institute of Medicine report."  
Nature Medicine....Volume 12 #9.....September 2006.....pg 984 - 985.....News In Brief

**Pursue becoming a**

**Master Of  
Sport**