7 Strategies for Injury Risk Reduction and Performance Enhancement for the Master's Athlete

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Workshop Objectives

- Physiological Changes with Aging
- Understand The S.A.I.D. Principle
- Strategy #1 - Screen
- Strategy #2 – Assess
- Strategy #3 – Warm up and Cool down
- Strategy #4 – Rest and Recovery
- Strategy #5 – Fuel
- Strategy #6 – Conditioning Technique
- Strategy #7 – Manage the funnel of stress!

- This presentation will give an overall picture of "what" to do. From here find practitioners in your area who can show you the "how".

What happens to us as we get older?

- Changes in proprioception.
- Altered sense of balance.
- Increased propensity for falls.
- Decreased coordination and reactivity.
- Decrease in lean muscle mass (sarcopenia).
- Decrease in strength from 40 years and accelerates thereafter. Lower body declines faster than upper body.
- Power declines faster than strength.
- Decrease in tissue extensibility/flexibility (collagen crossbridging = stiffness increase).
- **Decreased ability of the reparative process after injury.**

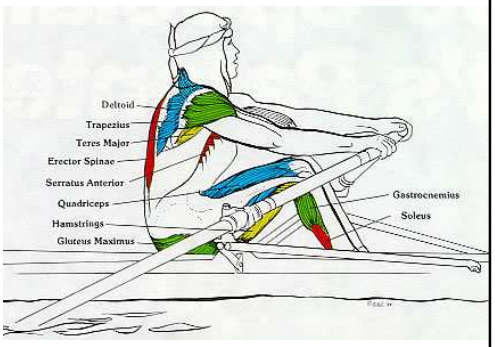
Declines in ROM are significant for the hip (20-30%), spine (20-30%), and ankle (30-40%) flexion by 70 years of age)

What happens to us as we get older?

- Overall decrease in cell function
- Decreased bone mass, blood supply to joint structures, and thinning of cartilage (osteopenia or osteoporosis and osteoarthritis)
- Decrease in organ function (cardiac output, renal/liver function, etc) – Dehydration risk
- Decrease in maximum heart rate, cardiac output, a-VO_2 difference, VO_2 max, vital capacity, and pulmonary ventilation. **Therefore a decreased cardiovascular response.**

Joint specific Aging Concerns

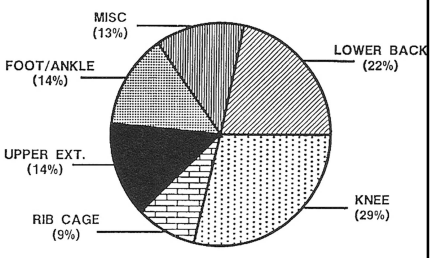
- Knees
- Declining vascular supply and nutrition in the meniscus – gives rise to complex tears.
- Osteoarthritis may be an issue.
- Important to observe the mobility of your hip and ankle joints.



Joint specific Aging Concerns

Shoulder:

- Depth of the **glenoid labrum decreases** with age due to degeneration forcing cartilage to bear the forces across the joint.
- Decrease in range of motion by a few degrees.
- Degeneration of **rotator cuff tendons**. Leads to pain and weakness in the acromion region, biceps anteriorly, deltoid, or mid humerus. The pain may radiate down the arm.
- Active and passive range of motion in internal rotation decreases with age.
- Degenerative changes in the **acromioclavicular joint** are common with increasing age.



Joint Specific Aging Concerns

- The intervertebral disc undergoes alteration in its structure with maturation and aging. The water content of the nucleus pulposus decreases and is replaced by a fibrous material. **The degeneration of the disc is a normal process of aging and not pathological.**
- **All joints** – The load at failure of ligaments **is less** as one ages (ACL and inferior GH ligament is 33-50% of younger individuals). **Sedentary lifestyle worsens this.**

What does this all mean?

- Training Goals:

1. **Increase available muscle and bone mass.**
2. **Increase overall strength (in particular, grip strength, rotator cuff).**
3. **Improve hip and ankle mobility and overall tissue quality.**
4. **Increase power**
5. **Improve balance and body awareness.**
6. Improve gait.
7. Improve reactivity.
8. Improve body composition (in particular waist girth).
9. **Improve cardiovascular fitness.**

What does this all mean?

10. Improve core/back control and fundamental motor programs. Motor programs are stored groups of movements that allow movements to be controlled. As they are developed, they become more automatic allowing the participant to concentrate on the use of the movement in everyday life (i.e. – squatting to pick up a grand child)

- **What are the fundamental motor programs?**
  - Squatting
  - Lunging
  - **Bend patterns**
  - **Rotation and Anti-rotation**
  - **Push and Pull (horizontal and vertical)**
  - Locomotion (walking, stepping, crawling, and running)
  - Non-locomotion (balance and body sway)
  - **Manipulative skills (throw, catch, squeeze)**

The S.A.I.D. Principle

- The S.A.I.D. principle is an acronym for a principle of training that stands for Specific Adaptations to Imposed Demands.
- Essentially you get what you train for!
- However, the S.A.I.D. principle can only be **optimized** when the whole training process and lifestyle practices of the athlete are in order. How well do you adapt if you get poor sleep? Or have a poor diet.

Strategy #1 – The Jedi Screen

- Screen what?

- General Health
- Joint Integrity
- Movement
- Lifestyle

Strategy #1 – Obtain a General Health Assessment

- Things to do:
- Fill out a PAR-Q+ (15-69 years age range)
- Obtain a Physical from your Physician
- Note your previous injuries and treatment received.
- Note your occupational stresses

Strategy #1 – Joint Integrity

- Screen out vulnerable areas
- There are 20 of these in my system. We will discuss three of these with you today.

7. Impingement Potential Test

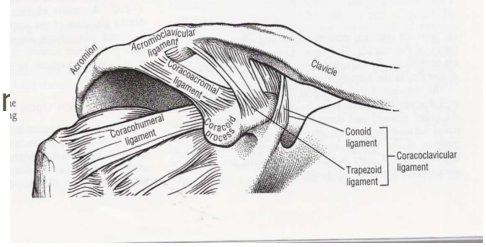
- Place hand on opposite shoulder.
- Lift elbow upwards as high as possible keeping the heel of the hand on the shoulder.
- Looking for pain and asymmetry.

8. AC Joint Grip Test

- The client grips the hands together under the chin by locking the flexed fingers together.
- The client attempts to pull the hands apart whilst maintaining the fingers in a tight lock position.
- AC joint pain indicates a positive test.

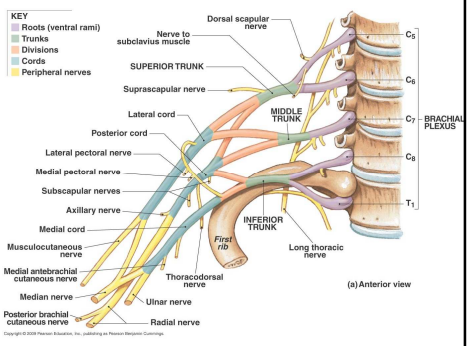
AC Joint Grip Test Cont.d.

- Cadaver studies reveal that only 10% of AC joints observed have fully intact AC joint discs. What does this say about wear and tear of the joint?
- Bench press and rows put forces through this joint. This screen may provide a warning before you prescribe these or similar exercises.



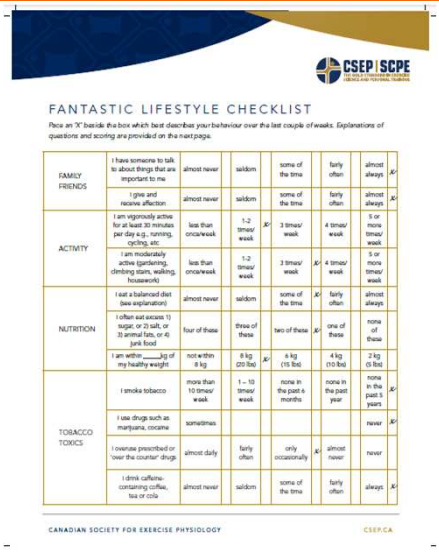
9. Grip Test

- Perform the CSEP-PATH Grip Test using a dynamometer.
- Note asymmetrical or inadequate strength.
- Can use the cheaper version of this test with your hands.
- Why is this important?
- Restrictions in the neck/ brachial plexus will show up in the hand (8 prime movers in the forearm and 11 in the hand neurally fed by this area) and you are only as strong as your hands!



Strategy #1 – Lifestyle Screen

- Tools:
- Fantastic Lifestyle Questionnaire
- Assesses what could be affecting your performance from a lifestyle perspective.



FANTASTIC LIFESTYLE CHECKLIST

Place an "X" beside the box which best describes your behaviour over the last couple of weeks. Explanations of questions and scoring are provided on the next page.

FAMILY FRIENDS	I have someone to talk to about things that are important to me	almost never	seldom	some of the time	fairly often	almost always	
	I give and receive affection	almost never	seldom	some of the time	fairly often	almost always	
ACTIVITY	I am vigorously active for at least 30 minutes per day e.g., running, cycling, etc	less than once/week	1-2 times/ week	3 times/ week	4 times/ week	5 or more times/ week	
	I am moderately active (gardening, climbing stairs, walking, housework)	less than once/week	1-2 times/ week	3 times/ week	4 times/ week	5 or more times/ week	
NUTRITION	I eat a balanced diet (see explanation)	almost never	seldom	some of the time	fairly often	almost always	
	I often eat excess 1) sugar, or 2) salt, or 3) animal fats, or 4) junk food	four of these	three of these	two of these	one of these	none of these	
	I am within ____kg of my healthy weight	not within 8 kg	8 kg (20 lbs)	6 kg (15 lbs)	4 kg (10 lbs)	2 kg (5 lbs)	
TOBACCO TOXICS	I smoke tobacco	more than 10 times/ week	1 – 10 times/ week	none in the past 6 months	none in the past year	none in the past 5 years	
	I use drugs such as marijuana, cocaine	sometimes				never	
	I overuse prescribed or 'over the counter' drugs	almost daily	fairly often	only occasionally	almost never	never	
	I drink caffeine-containing coffee, tea or cola	almost never	seldom	some of the time	fairly often	always	

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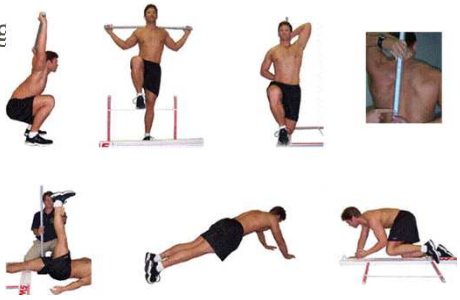
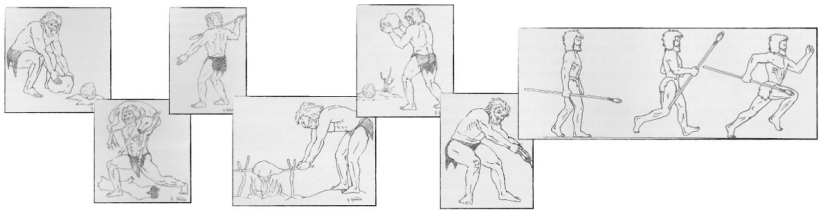
Strategy #1 – Screen Movement – Screen Primal Patterns

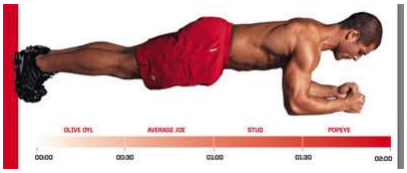
The FMS is a ranking and grading system that documents 7 movement patterns that are key to normal function. By screening these patterns, the FMS readily identifies functional limitations and asymmetries. You will gain knowledge on your stability, mobility, balance, and injury risk.





Strategy #2 - Assess

- "If you are not assessing you are guessing" (famous quote from brilliant therapist Paul Chek – 1996)
- Assess what?
- Assess both health-related and skill related components of physical fitness.
- This provides a baseline to monitor training effects.
- Lack of fitness leads to fatigue which often leads to injuries.



Health –Related	Skill-related
1. Body Composition	1. Agility
2. Cardio-respiratory Fitness	2. Balance
3. Muscular Strength	3. Coordination
4. Muscular Endurance	4. Power
5. Flexibility	5. Reaction Time
	6. Speed

Strategy #3 – Warm up and Cool down. Why do we warm up?

- Tissue quality (SMFR)
- Muscle extensibility
- Joint mobility
- Elevate body temperature
- Address planes of movement
- Excites nervous system
- Mentally prepares for training or competition.

Strategy #3 - Why is warming up important?

To combat what happens to us when sitting!!

Consequences to our body from sitting:

1. Low functional capacity.
2. Short and weak hip flexors.
3. Spinal flexion = long weak upper/mid/low back muscles.
4. Forward head – short cervical extensors and long weak flexors.
5. Poor breathing.

To prepare our body for fundamental movement pattern execution.

- Squat
- Lunges
- Hinges
- Pushes
- Pulls
- Rotation
- Gait/locomotion

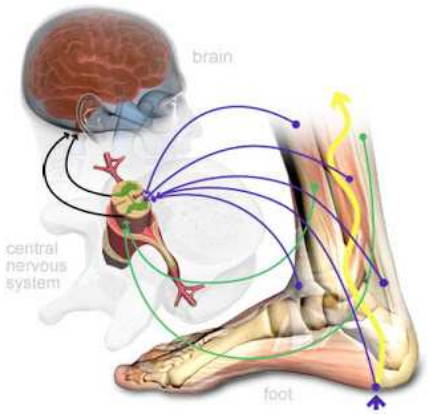
As well as Balance for execution of patterns above

Strategy #3 - Joint by Joint Philosophy

Joint	Primary Training needed
Ankle	Mobility (dorsiflexion and inversion/eversion)
Knee	Stability
Hip	Mostability (all planes)
Lumbar Spine	Stability
Thoracic Spine	Mobility (ext./rotation)
Scapulothoracic joint	Mostability Retraction/protraction, Upward rotation, depression
Glenohumeral joint	Mobility – ext/int.rotation and flexion

Strategy #3 – Include Proprioceptive Exercises in your Warm-up

- Awareness of your body in space.
- Proprioceptive exercises activates survival reflexes which can activate dormant muscles.
- Includes a few balance exercises in your warm up
- **For rowing – stability ball balance exercises in the sitting position can be used.**



Strategy #3 – Warm up and Cool down

What can you do for cool downs?

- Light intensity activity
- Static stretching
- Foam rolling
- Corrective/Rehab work

Strategy #4 – R & R

- " Recovery is the process the athlete goes through to return to a state of performance readiness" – Dan Benardot, PhD.
- It is important to look at overtraining symptoms.

Signs of Over training

- **Signs in Your Training**
  - Persistent soreness in joints, tendons, or muscles.
  - Recovery takes longer.
  - Performance decline.
  - Labored breathing during a workout of normal intensity.
- **Signs in Your Life**
  - Increases tension, anger, irritability.
  - No interest in your usual activity.
  - Poor concentration (clumsiness, tripping etc).
  - Not sleeping well.
- **Signs in Your Health**
  - Increased infections and colds.
  - Increase of 6-8 BPM in morning resting HR.

Recovery Log (Modified by Justin(2012) from Jeffreys, 2008)

Mon.		Recovery		Other Training	Team Practice
		General health	5 4 3 2 1	Time: _____ Dur: _____ RPE: _____	Time: _____ Dur: _____ RPE: _____
Wake HR (BPM)		Appetite	5 4 3 2 1		
Wake Wt. (kg)		Motivation	5 4 3 2 1		
Hrs. of sleep		Energy Levels	5 4 3 2 1	General Comments	
Optional: Performance Parameter Measured: _____ Score:_____ Personal Best Score: _____		Muscle fatigue/soreness	5 4 3 2 1		
		Sleep quality	5 4 3 2 1		
		Work/School Quality	5 4 3 2 1	Recovery Techniques used:	
		Nutrition	5 4 3 2 1	Recovery Score: _____/40 Total Recovery Score of 24 or less or any individual scores of 3 should be investigated by the coach.	

What gets measured gets managed!!

Other Training and Team Practice RPE Log

Session Exertion Rating	
Rating	Description
0	Nothing
1	Extremely Light
2	Very Light
3	Light
4	Light to Moderate
5	Moderate
6	Moderate to Hard
7	Hard
8	Very Hard
9	Extremely Hard
10	Maximal Effort

Recovery Log (Modified by Justin(2012) from Jeffreys, 2008)

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General Comments and Optional

- This is a general diary on your thoughts, feelings, emotions etc.
- The optional section is to measure a performance parameter to see where it is in relation to your best score. If it drops drastically then over-training can be suspected.

Mon.		Recovery		Other Training	Team Practice
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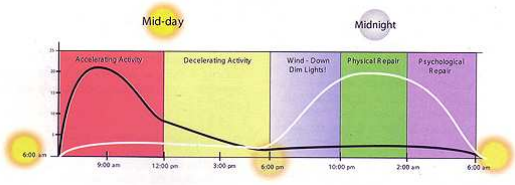
Strategy #4 – R&R Sleep Right

1. Go to sleep by 10:30pm as often as possible. Most physical repair occurs between 10pm-2am and psychogenic and immune repair between 2am-6am.
2. Minimize exposure to bright lights for at least 2 hours before going to bed.
3. Avoid the consumption of stimulants after lunch if at all.

Black line – Cortisol and stress activating hormones
White line – Melatonin and growth and repair hormones.



Strategy 4 – R & R Tips

Try to instill the following practices into your regime:

- Getting adequate sleep
- Proper nutrition
- Reducing intake of toxins
- Manage stress
- Try massage, relaxing baths, saunas, contrast showers if feasible.
- Stretch and self massage
- Mental training

As a coach try to instill the following practices in your coaching:

- Plan your year of training and competitions.
- Avoid rapid increases in intensity and volume.
- Decrease monotony in training
- Minimize multiple time zone travel as best you can.
- Avoid too many competitions

Strategy #5 – Fuel

1. Drink plenty of water. (Urine should be clear or pale yellow)
   - Avoid distilled water.
2. Be aware of food additives. This creates more work for your liver having to detoxifiy them. Minimize use of processed or "enriched" foods.
3. Avoid GMO foods.
4. Avoid Irradiated food.
5. Watch for hidden sugars on ingredients (-ose endings). **Watch for artificial flavor. Avoid artificial sweetners.**
6. Consider centering your shopping around organic or local food if possible.

Strategy 5 - Fuel

7. Avoid fast food as much as possible. It is poor quality of food. High calories and very low nutrients. This includes vending machines

8. **Be aware** of sports or energy drinks!

9. Eat a variety of whole foods.

10. Consider taking a multi-vitamin mineral daily.

11. Consider trying to eat vegetables with every meal.

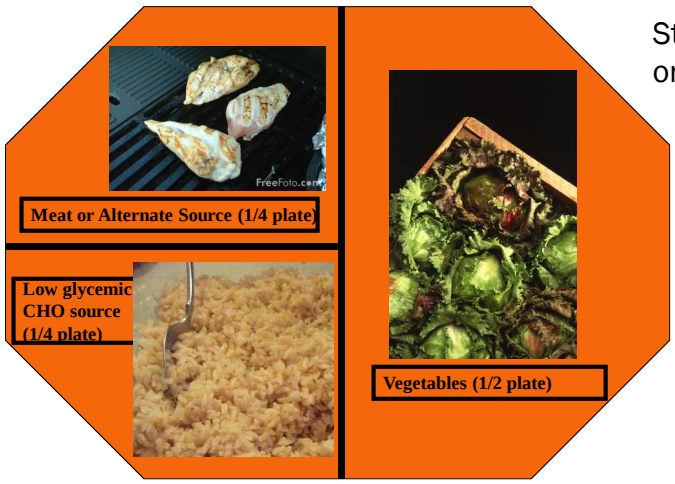
12. **Use the 80/20 rule for diet if needed. – 80% of the good stuff to keep you alive and 20% of the "not-so healthy" foods to help you live!**

Bonus points:

- **Try your best to not go more than 4 hours without eating.**
- **Try to have breakfast every morning.**

This stuff is absolute garbage!

Using the Plate Method of Portioning

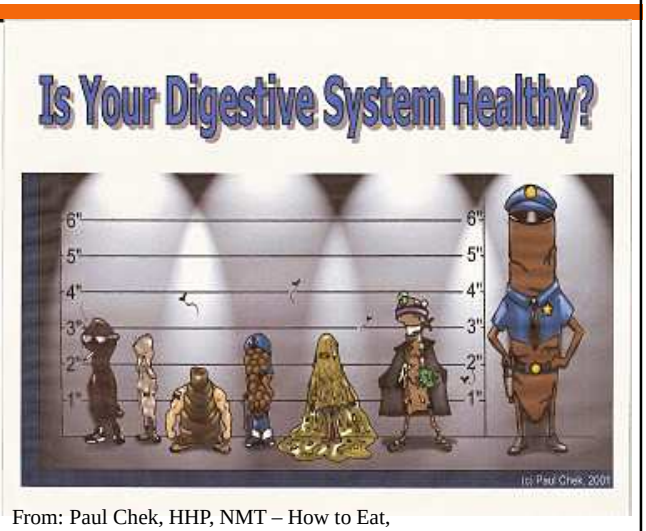


Starting point only!

Poopie line up – Checking your digestion

From right to left
-**Poopie policeman** (healthy poop) – formed, passes easily, light brown, smells earthy not foul, and floats.

- **Flasher** – undigested food particles.
- **Diarrhella** – body's attempt to detoxify.
- - Pellet man- altered states of peristalsis and dehydration
- **Pellet Man** – may indicate altered states b/w peristalsis of the colon and dehydration
- - **Bodybuilder** – too much dehydrated foods such as protein powders – hard to pass
- **Olympic swimmers** – undigested fat (insufficient bile) – hard to flush.
- **Mr. Sinker and Stinker** – processed foods, medical drugs, and environmental toxin exposure



From: Paul Chek, HHP, NMT – How to Eat, Move, and Be Healthy

Strategy #5 – Fuel – Anti-inflammatory

- Consider adding more anti-inflammatory foods to your diet overall to keep it at bay.
- Vegetables
- Walnuts
- Salmon
- Turmeric
- Avoid excessive coffee and alcohol as these are pro-inflammatory. Keep this moderate.
- Athletes need to avoid smoking completely.

Strategy #6 – Conditioning Technique

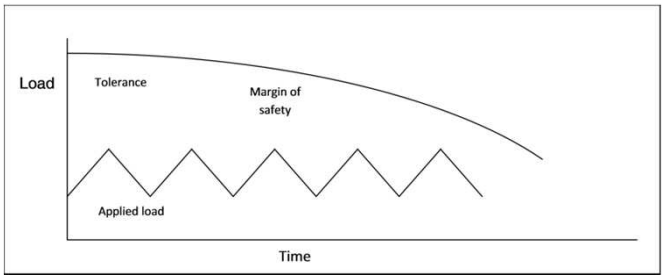
- Learn to adapt exercises to **your** anatomy.
- Common Examples:
- Squats – stop the descent when the athletes pelvis tucks under.
- Bench press – Feel for when the shoulder capsule has reached its end point.
- Press overhead in the scapular plane when possible.
- Lat. pull downs to the front and not the rear of the head.
- Upright rows – decrease traditional ROM
- Consider the effect of isolated exercises on function. Do you need to waste valuable training time and use recovery reserves for these?
- Look for movement breakdown in the mirror as you are training:

Some common breakdowns (lost kinetic connections – "Kinnections") are below:

- Foot arch collapsing
- Knee going into valgus
- Hip dropping/ jutting out to the side
- Back arching via anterior pelvic tilt or ribs protruding outward
- Back rounding due to posterior tilt or ribs moving downward
- Shoulders rounding forward.
- Head jutting forward.

Strategy #6 - Technique awareness in and out of the gym!

- Consider tissue tolerance – Poor movement and positioning during the day (ie. how you sit at work) reduces tissue tolerance which increases risk of breakdown.
- Make cognitive association about how alignment during exercise carries over to real life and vice-versa.



McGill (2007)

Strategy #7 – Managing the Funnel of Stress

- Stress and fatigue manifest themselves differently in each athlete.
- Ask yourself the following questions on a continual basis:
  1. Am I enjoying my training?
  2. What are my energy levels like?
  3. What is my performance like?
  4. Do I feel recovered?

Stress Effects and Performance

Look at the signs on the side picture here.

Consider how this will effect performance.

Use a stress management assessment tool to get a baseline.

Some Signs of Stress

Physical Signs
- Increased heart rate
- Muscle aches, stiffness or pain
- High blood pressure
- Frequent colds or flu
- Weight gain or loss
- Headaches
- Constipation
- Sweating
- Nausea
- Fatigue
- Trembling

Behavioural Signs
- Increased smoking, drinking, drug use
- Aggression (ie. Yelling, swearing)
- Changes in eating habits
- Changes in sleeping habits
- Nervousness (Fidgeting, pacing, etc).

Mental Signs
- Difficulty concentrating
- Decreased memory
- Confusion
- Difficulty making decisions
- Bad dreams
- Decreased libido
- Inattentiveness

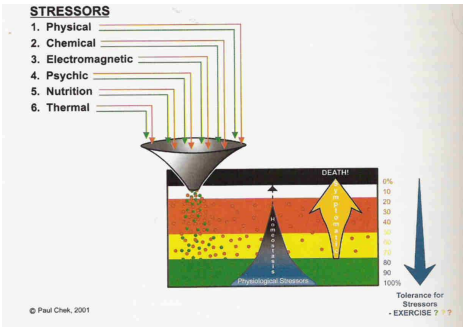
Emotional Signs
- Anxiety
- Anger
- Irritability; short temper
- Impatience
- Worry
- Fear
- Frustration

All stress summates!!

- An athlete needs to consider overall stress (training, competitive, and life stress (school, work, relationships)).
- **Quantitative measures**:
  - Resting Heart Rate
  - Waking Body weight

(body weight falling for a period of 3 days could be an early indicator of under recovery)

  - Sleep hours



Stress logging

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STRESS AND STIFFNESS

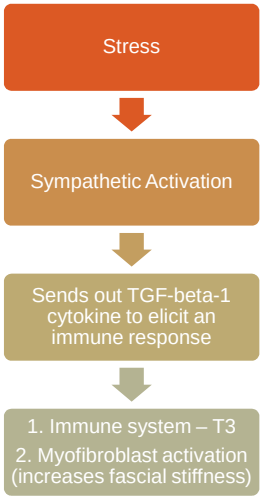
See diagram to the right.

How does this affect your quality of movement during training?

Last nights fight with your significant other may elicit a different movement strategy.

Habitual hyperventilation (breathing problem) can trigger anxiety/stress (Chaitow, 2008).

Depending on the degree of stress produced it can decrease mobility of the vertebra (Schafer, 1987).



"Winning is the science of being totally prepared."

- George Allen