FITNESS & NUTRITION EXPERT PROGRAM

FITNESS SESSION 8:

Levels, Modifications and Injuries

What we are going to cover

TEACHING A MIXED LEVEL GROUP:
- How to offer level systems
- Positive Context

RPE CHART:
- What it is and how to effectively use this tool with clients

MODIFICATIONS:
- Setting clients up for success with injuries or specific requirements

INJURIES:
- Setting clients up for success
- Common injuries and modification options

What we are going to cover

INFLAMMATION

MUSCULO-SKELETAL INJURIES: SPRAINS VS STRAINS

MUSCULO-SKELETAL INJURIES: SPINE, BACK AND CORE

CARDIO – RESPIRATORY CONDITIONS


I'M NOT
HERE TO BE
AVERAGE
I'M HERE
TO BE
AWESOME

What you need before we start

1. Water
2. Put your finger tips together
3. Take 3 deep breaths


MIXED LEVEL PROGRAMMING

MIXED LEVEL PROGRAMMING

Number 1 question and how to answer it

MIXED LEVEL PROGRAMMING

Remove the word “can’t” from your vocabulary

MIXED LEVEL PROGRAMMING

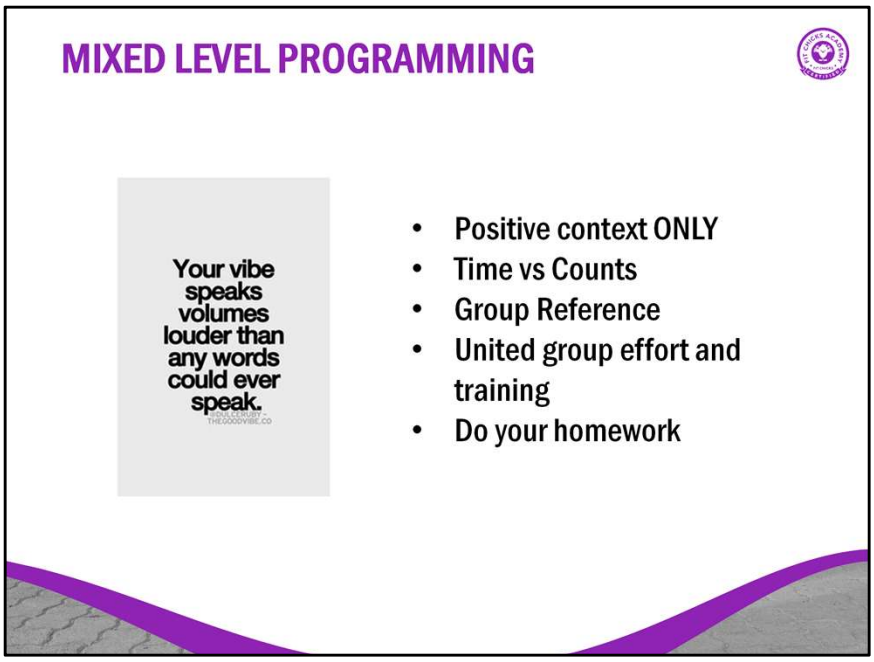
Want to challenge but never overwhelm

MIXED LEVEL PROGRAMMING

Inclusive programming, language, cueing and demonstrating

MIXED LEVEL PROGRAMMING

Non competitive environment



https://theverticalworkshop.wordpress.com/2010/04/16/92/

MIXED LEVEL PROGRAMMING

Level 1

- Low impact
- Lower intensity
- RPE 9 out of 10 for this individual
- Stepping motions
- Body resistance training
- Light weights for upper body movements
- Rest options
- Beginning option / injury modification

MIXED LEVEL PROGRAMMING

Level 2

- Basic fundamental movements
- Mid level impact
- RPE still at 9 out of 10
- Addition of heavier weights to movements
- Impact options available
- No real injuries or issues

MIXED LEVEL PROGRAMMING

Level 3

- High Intensity throughout
- Plyometric movements
- Heavy weights
- Quick transitions with little to no rest periods
- RPE 9 out of 10
- No injuries
- Complete body awareness
- Push past physical and mental barriers

RPE CHART

RPE CHART

The RPE Chart is the rate of perceived exertion

FIT CHICKS *"Rate of Perceived Exertion"* CHART

PRE *Perceived Rate of Exertion* SCALE 1–10	% Max Heart Rate	How I'm Feeling		Description
1–4	< 50%		Aerobic, Endurance, Recovery	Barely working. Could do this all day!
5–6	55%			Just warming up or cooling down. Feeling a little toasty! You're breathing a little faster.
6.5–7	65%–70%		Aerobic	Breaking a sweat and breathing is getting faster (like a fast walk)
7.5	75%			Feels like work but you can sustain it
8	80%			Working hard! You can talk but its getting tougher
8.5	85%			Sweating and working VERY hard but you can still push a little more
9	90%		Anaerobic	Really pushing chicks! Can only stay here 30 secs – 1 min (you can do it!).
9.5	95%			Breathing is very fast. Only stay here about 20 secs
10	100%			Max effort! This is your limit.

Working at your 9 out of 10.

To get the benefits HIIT, you NEED to push yourself past the upper end of your aerobic zone and allow your body to replenish your anaerobic energy system during the recovery intervals. At FIT CHICKS, we call this "Working at your 9 out of 10" to ensure our chicks are getting the max results from their high intensity interval bootcamp classes.

How to measure your 9 out of 10?

Working to your "9 out of 10" is part of the "RATE OF PERCEIVED EXERTION" (or RPE). This 1–10 scale is an easy, amazing way for any chick to measure her exercise intensity without having to use any equipment (ie a heart rate monitor).

RPE CHART

How to use the chart with your clients:

1. Use this as a measurement tool to ensure they are working within the range that you are requiring and or requesting they are working at
2. Gage which level clients should be working at
3. Explain to clients the levels at the start of every program so they are aware of what you mean when you use numbers as your tool to motivate them

MODIFICATIONS

MODIFICATIONS

Introduce modifications when required or requested.

These are different from your levels

They should be set up in advance with clients vs on the spot. (key to having that connection in your programming)

MODIFICATIONS

IMPORTANT

Offer alternative exercises for modifications that use same muscle group not just a simpler version of the movement.

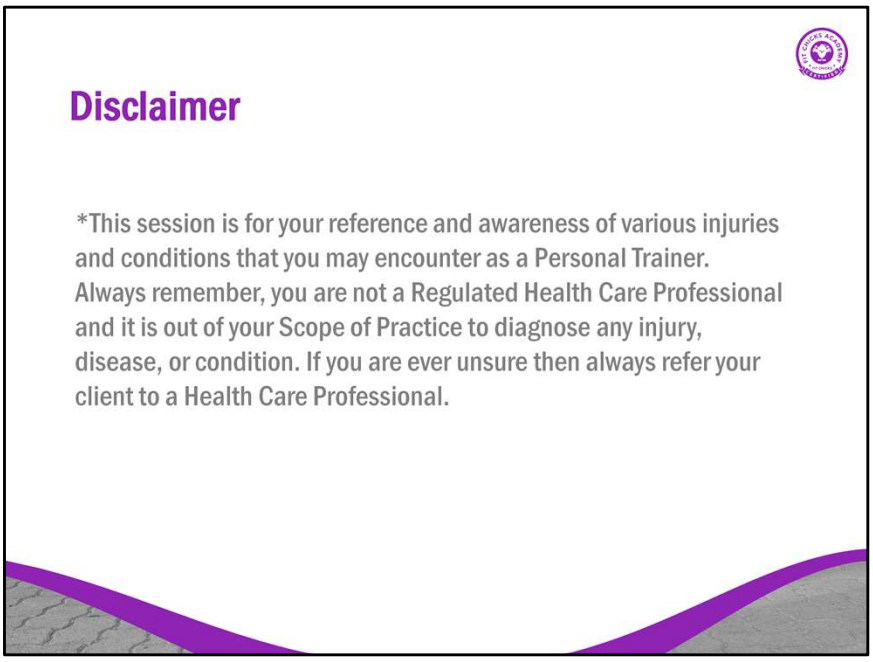
Example:
Push up requires modification for someone with a wrist injury
Offer chest press instead still same muscle group working with limited pressure to injury

INJURIES

INJURIES

Best way to help avoid injury with clients

- Review PARQ and Waivers
- Discuss during assessment
- Prepare in advance to accommodate
- Know your options
- Doctor clearance when required
- Have incident reports on hand



Doctor, physio, chiro

Disease and Injury: Definitions

Pathophysiology

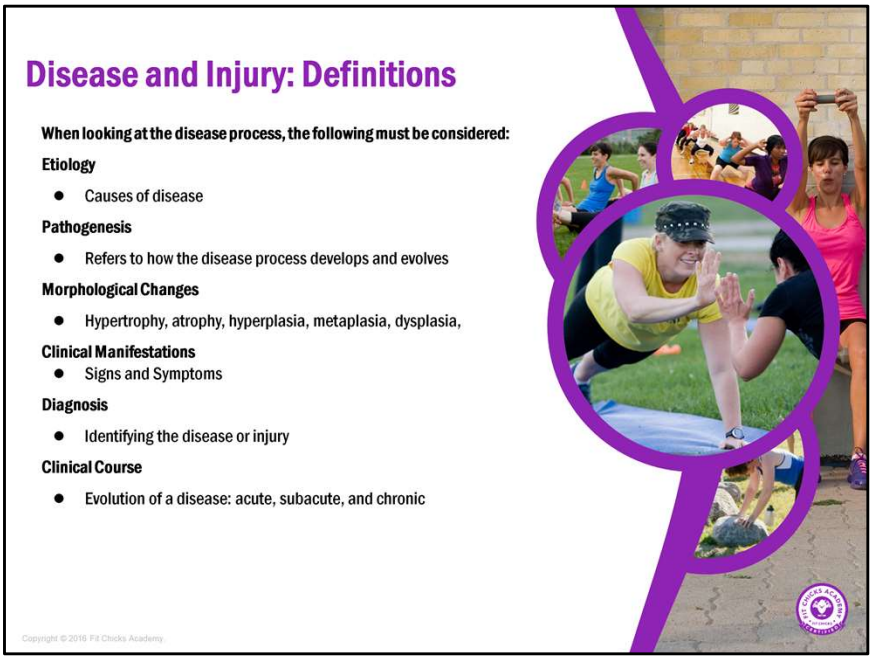
- Study of changes in body functions caused by disease

Pathology

- Greek for disease
- Study of structural and functional changes in cells, tissues, and organs of the body.

Disease

- Any deviation from or interruption of the normal structure or function of a part, organ, or system of the body



Etiology:

- Biological Agents - bacteria, viruses
- Physical Forces - trauma (wound, injury), burns, radiation
- Chemical Agents - Poisons (alcohol, toxins)
- Nutritional excesses and deficits

Pathogenesis

- sequence of cellular and tissue event that take place from time of initial contact with an etiologic agent until the ultimate expression of a disease
- Ex – muscle strain – straw that broke the camels back

Morphological Changes

- hypertrophy - increase in cell size
- atrophy - decrease in cell size
- hyperplasia - increase in number of cells
- metaplasia - a reversible change in which one adult cell type is replaced by another adult cell type
- dysplasia - deranged cell growth that leads to changes in size, shape, and appearance. (all of the above = dysplasia)

Clinical Manifestations:

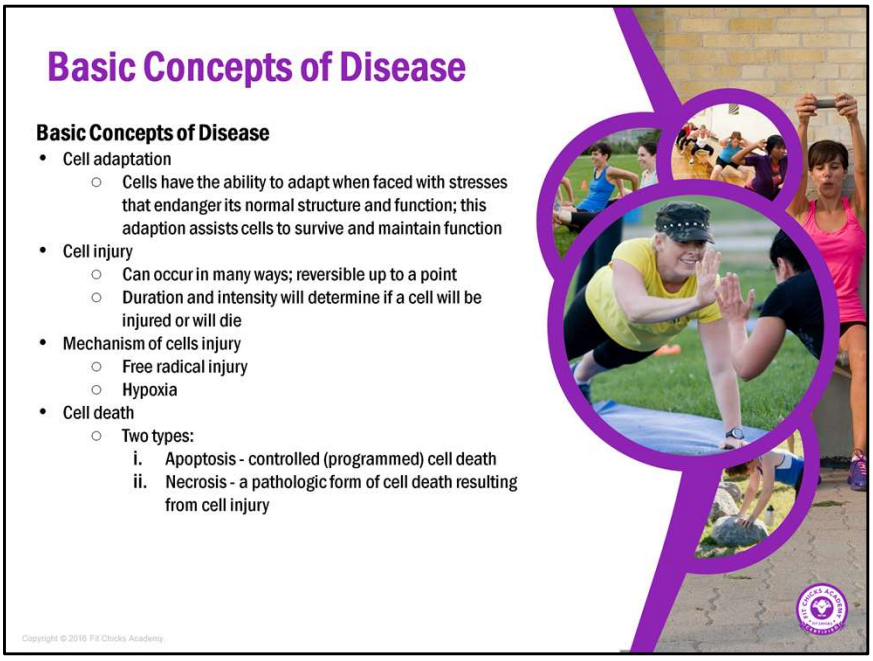
- Symptom: Subjective complaint that is noted by person with a disorder
    - ex. Pain, difficulty breathing
- Sign: A manifestation that is noted by an observer
    - ex. Elevated temperature, a swollen extremity

Symptom = quantifiable by them
Sign = more quantifiable

ex. If you stab a bunch of people in the arm they will all quantify the pain differently but if all those people have a fever of 102 it's the same for everyone.

Clinical Course

- Acute – 1-3 days, up to 4 weeks (<1 mth)
- Subacute – 1-3 months
- Chronic – any condition, disorder, or disease that in on-going (>3 mths or longer)



Maintain Homeostasis – state of steady equilibrium, goal is to maintain relatively constant conditions in the body ie. Body temp

Cell adaptation - there are limits, if too much stress = injury or death

- a cell can return to its pre-adaptive state once signal for adaption is removed
- can be normal or abnormal depending on whether the stimulus was appropriate or inappropriate.
- adaptations include morphological changes

Cell injury - due to etiological agents

Mechanism of cell injury

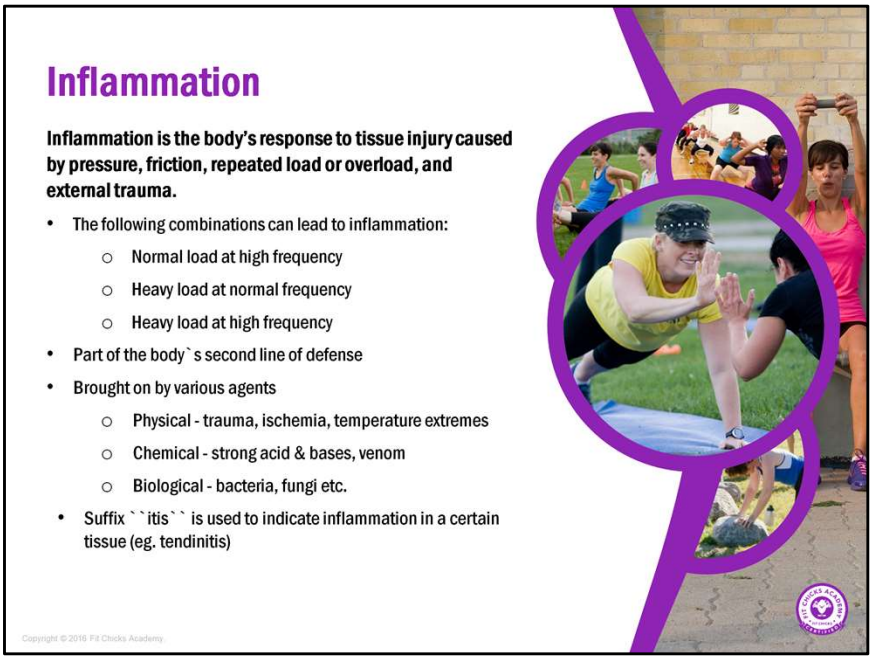
- free radical - highly reactive chemical species that can lead to cell injury by reactin gwith key cellular components or setting off chain reactions leading to widespread damage.
    - Free radicals = bad
- hypoxia = lack of Oxygen, this interrupts ATP production (ATP needed for everything)
    - can be due to inadequate o2 in the air (high altitudes), respiratory disease, ischemia (decreased BF to an organ)

Cell Death

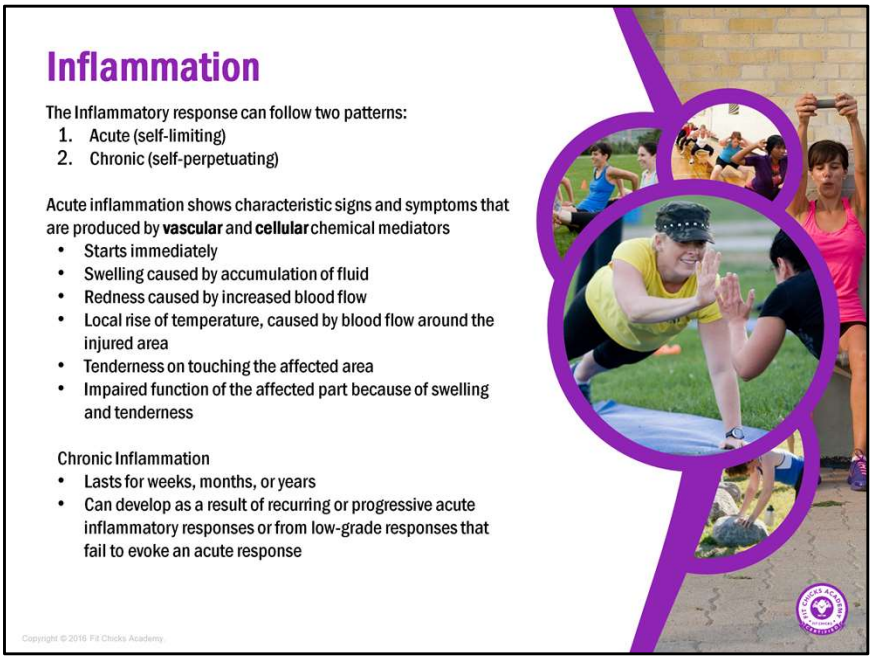
- apoptosis - ex - separation of webbed fingers and toes, removal of white blood

cells after an inflammatory response

- necrosis - characterized by cell swelling, rupture or the cell membrane, and inflammation



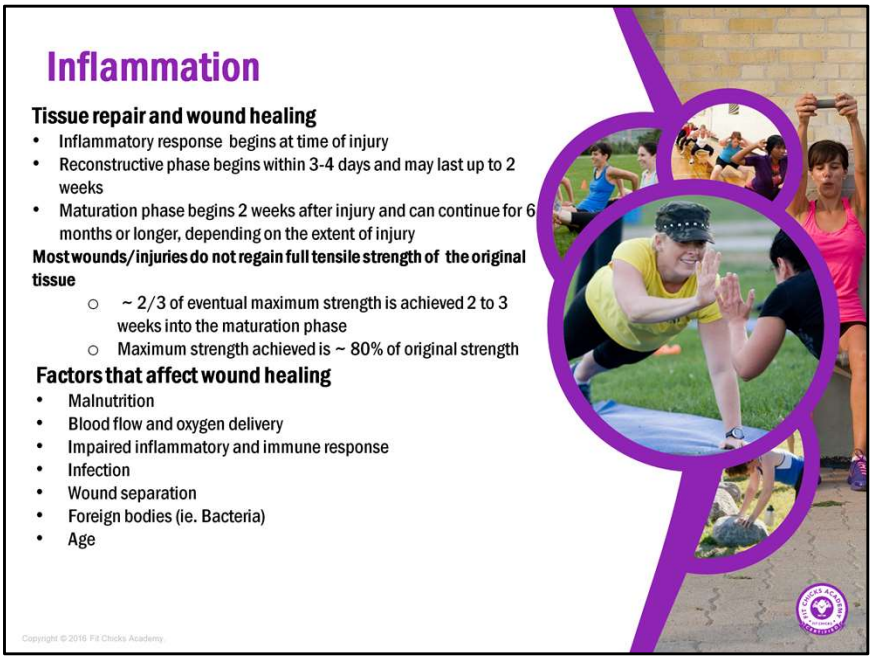
Can also produce devastating effects - rheumatoid arthritis (destroys healthy tissues)



Can also produce devastating effects - rheumatoid arthritis
Vascular = swelling and redness
Cellular = happening at the cell level - we won`t get into detail. It's a long and complicated process

***Pain should be interpreted as a warning sign of tissue injury and should lead to a rest from activity**
There is good pain and bad pain

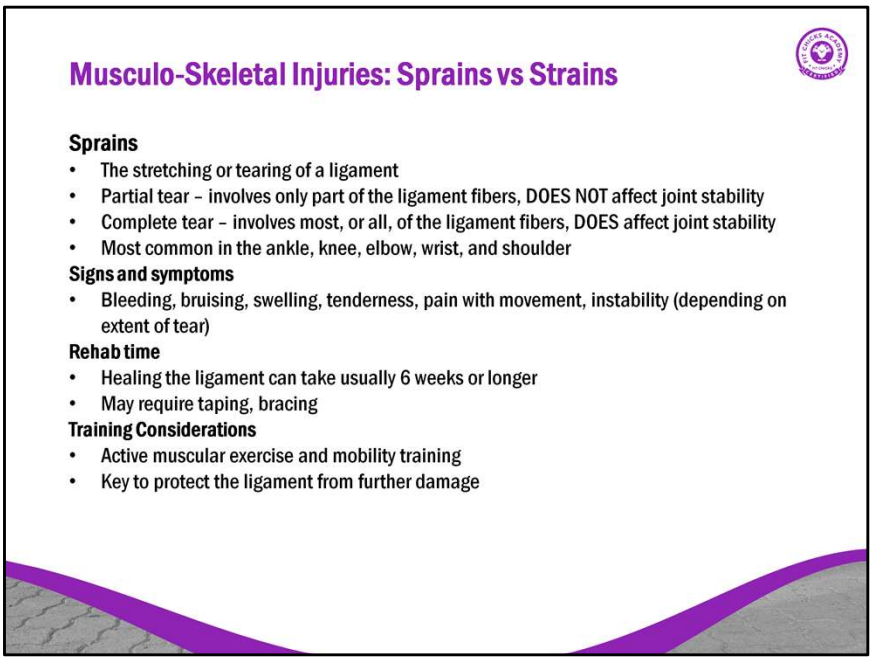
Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ. (pg. 42)



Malnutrition – body requires nutrients to heal

Can also produce devastating effects - rheumatoid arthritis
Vascular = swelling and redness
Cellular = happening at the cell level - we won`t get into detail. It's a long and complicated process

This decrease in strength happens at the fiber level, the muscle as a whole may be stronger than pre-injury but the injured fibers themselves never will be 100% again

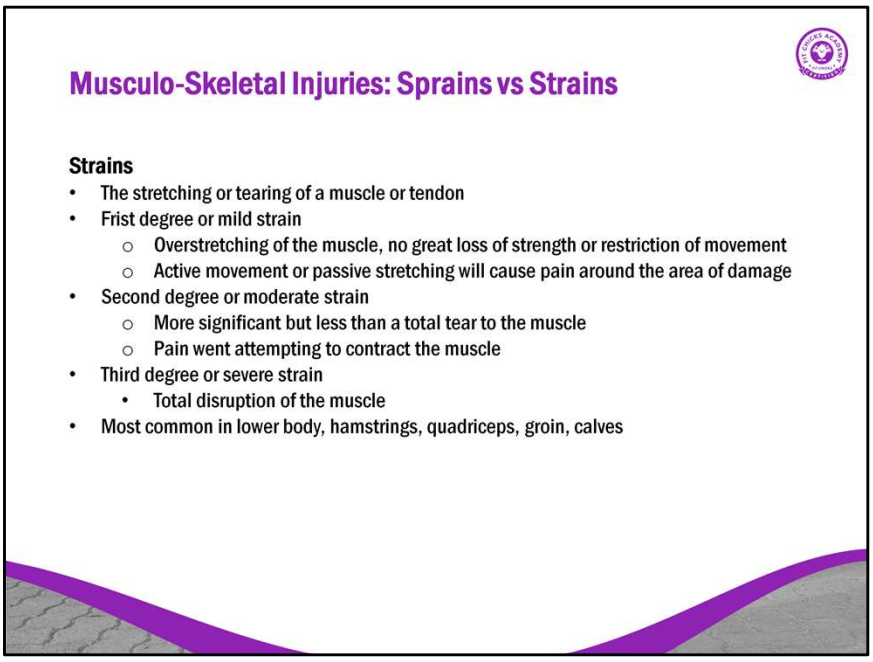


Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ. (Pg 24)

Be careful with:
Plyometrics and quick movements

Try to:
Strengthen mm's around the joint
Balance and stability work

Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ. (Pg 24)
https://en.wikipedia.org/wiki/Sprain#/media/File:Sprained_foot.jpg
https://gearjunkie.com/how-to-prevent-treat-sprained-ankle



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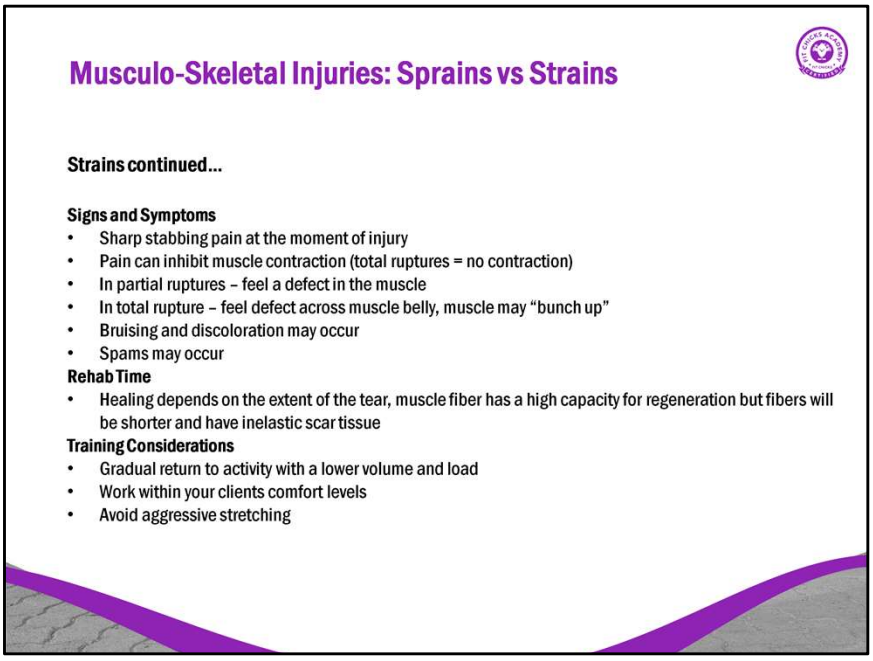

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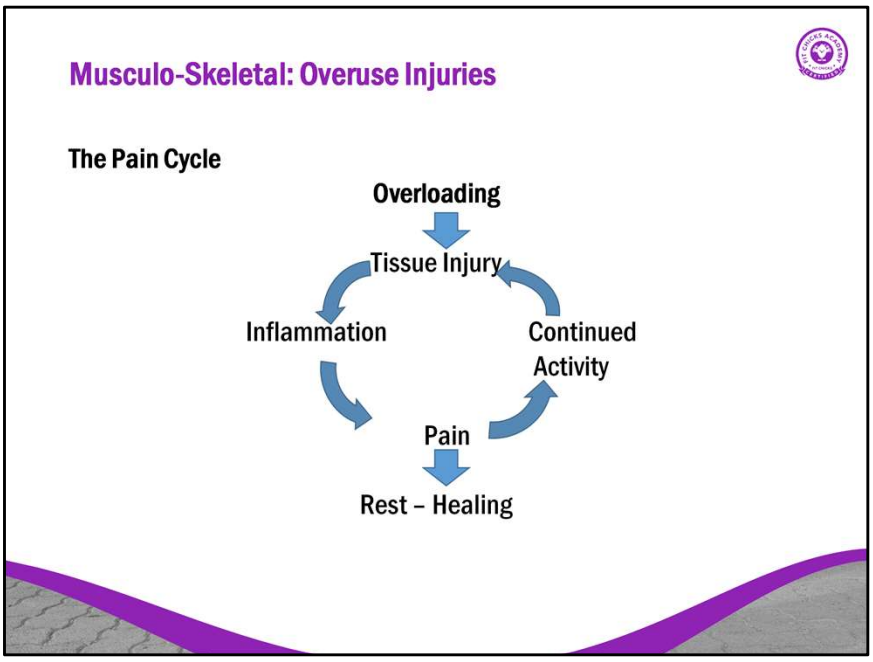
Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg.30)

Soft tissue work to break up scar tissue

https://www.brisbanechiropractor.com.au/blog/what-is-a-muscle-strain-or-tear/
https://www.strengthminded.com/can-you-pull-a-muscle-without-knowing-it/

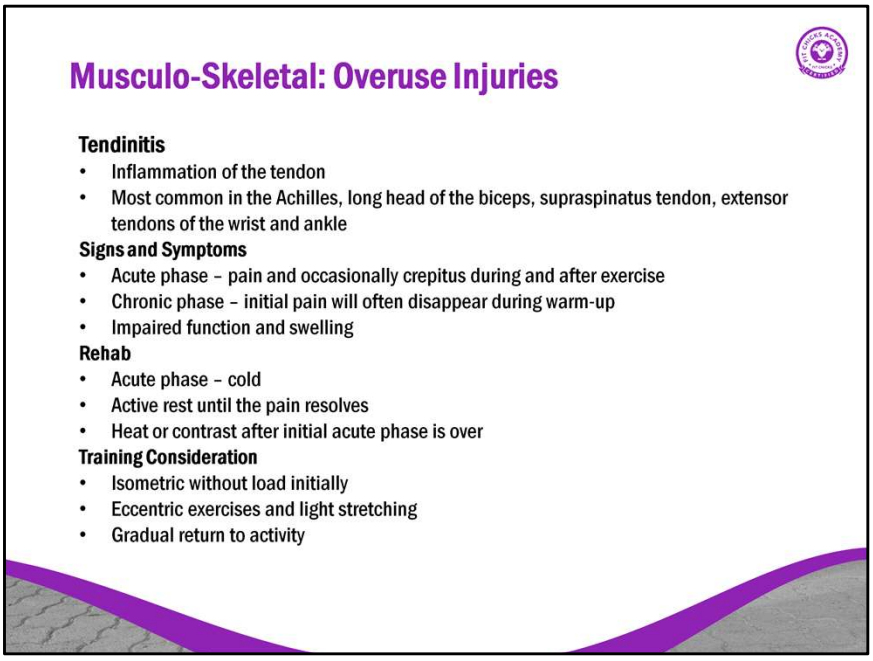


The pain cycle
Common with overuse injuries
Age of occurrence
- Top level athletes = 20-29
- Non competitve athletes = 30-49

Sports involved = endurance sports ie. Long distance running, individual one-man sports like tennis, gymnastics, weight-lifting

Prevention of overuse injuries
- Thorough warm-up before and cool down afterwards
- Varied training, try to avoid repetitive, one-sided movements
- Gradual adaptation to new conditions – Going from running on a treadmill to outside
- Equipment adjusted to the environment
- Good basic training and general conditioning – make sure the basic movement patterns are there – adequate mobility, flexibility, strength and cardio

Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(pg45)

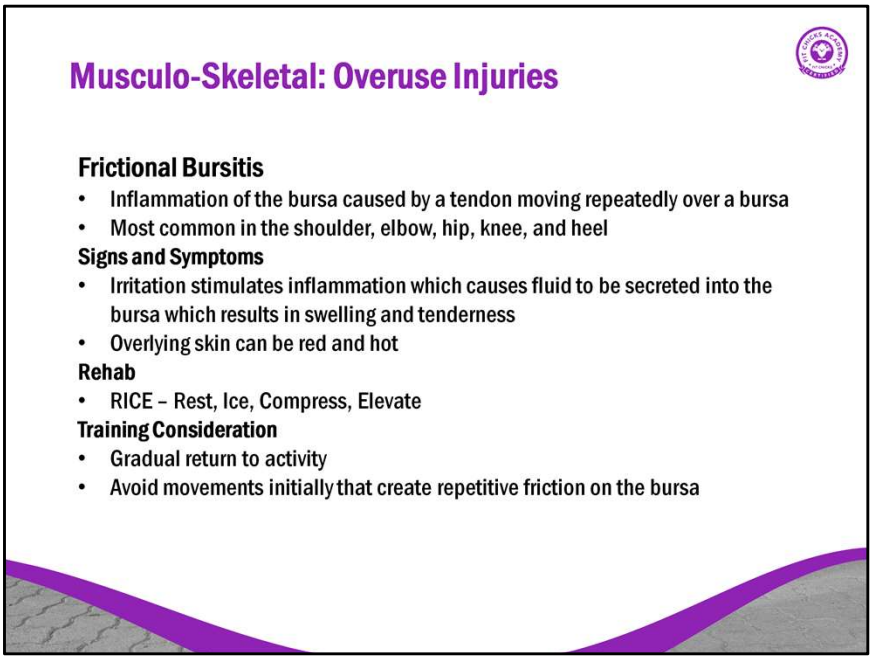


Tendinitis can be very difficult to treat and without rest can lead to chronic tendinitis and even tendinosis

Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.

Crepitus = creaking sound

Focus it to return to pain free movement

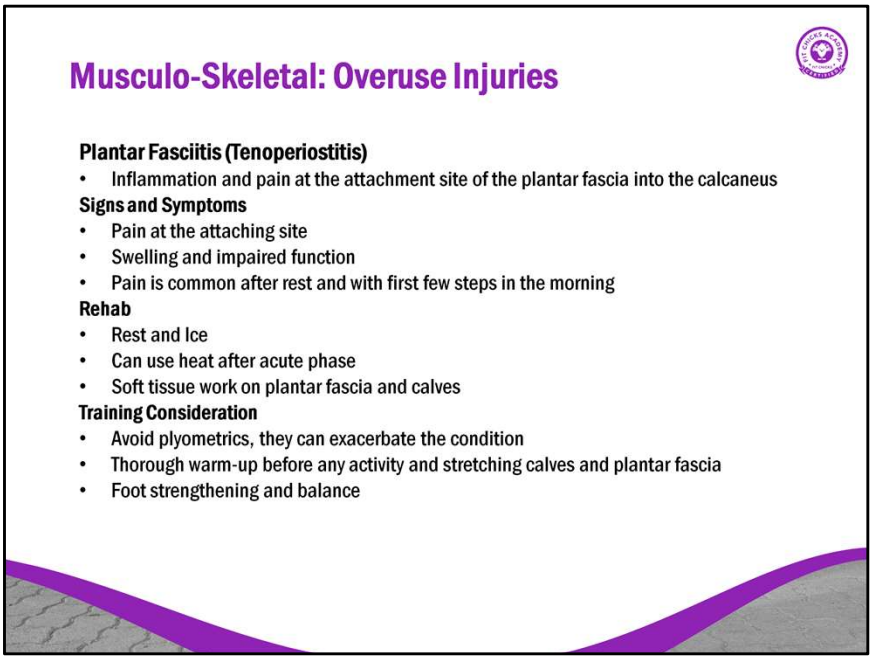


Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg47-48)

Bursitis can be extremely painful

Bursa – fluid filled sac around synovial joints, cushions, decreases friction between bone and soft tissue

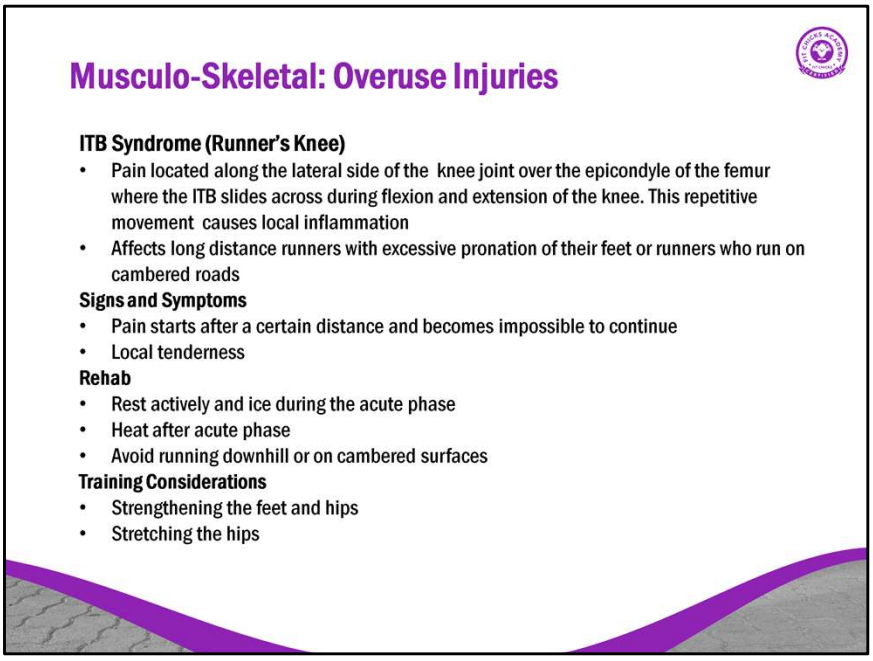
Focus on low volume work starting back after injury, avoid creating excess friction along the bursa



Tenoperiostitis is also common in the forearm – golfer's elbow and tennis elbow (don't need to be a golfer or tennis player to get either!)
Plantar fasciitis can be very hard to treat and can linger for a long time. Home care is crucial. Rolling and stretching the feet and calves before taking first few steps after sitting or sleeping. Foot strengthening and balance are also very important.

Avoid aggravating activities

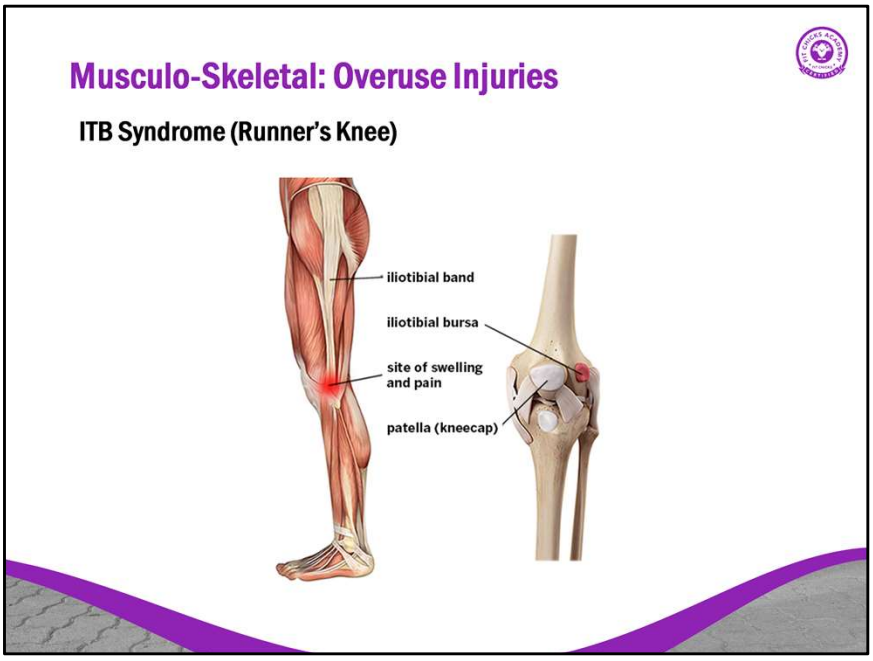
Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.



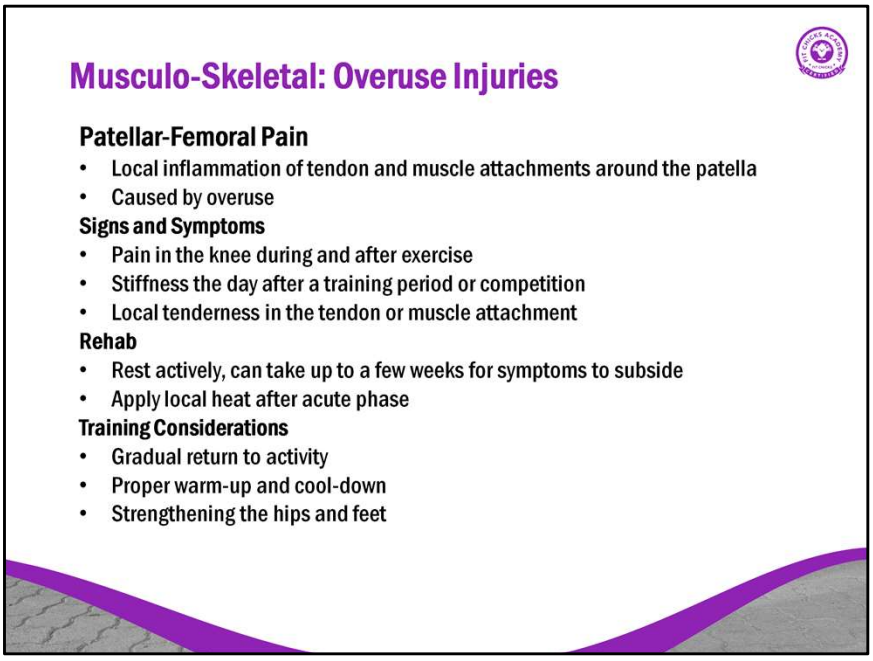
Runners are notorious for neglecting strength training and stretching. Both are very important in preventing runner's knee

Some ppl refer to patellar-femoral as runner's knee

Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.

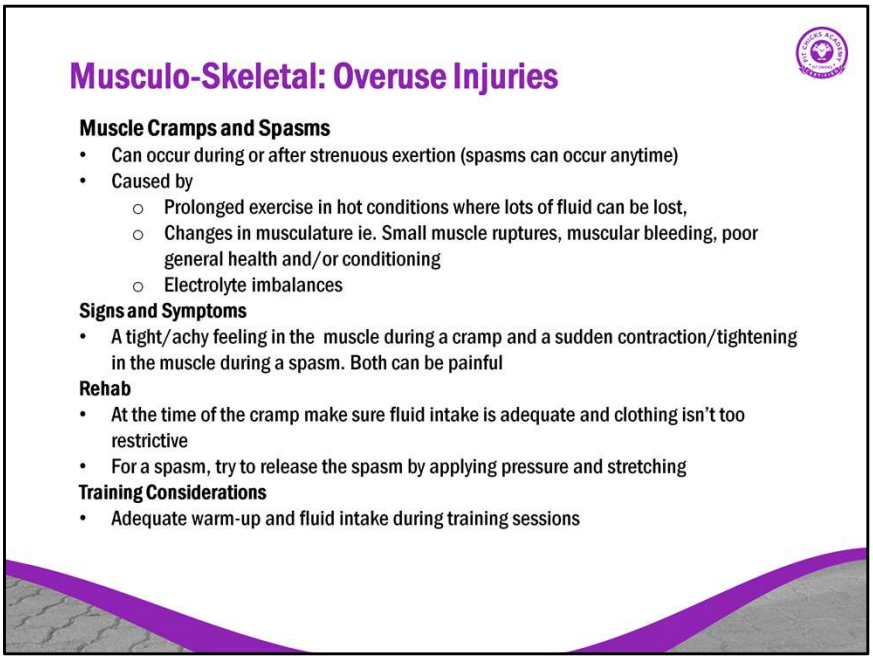


https://www.hss.edu/condition-list_iliotibial-band-syndrome.asp



Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ. Pg 307

Usually with knee pain it's either the feet, hips or both that are weak
Foam roll the quads



Dehydration predisposes to muscle cramp

Precise cause of cramps is still argued – but any factors that impair circulation should be considered

Some people get random muscle spasms in the middle of the night

Adjust training session based on conditions, especially if training outdoors

Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.Pg 61

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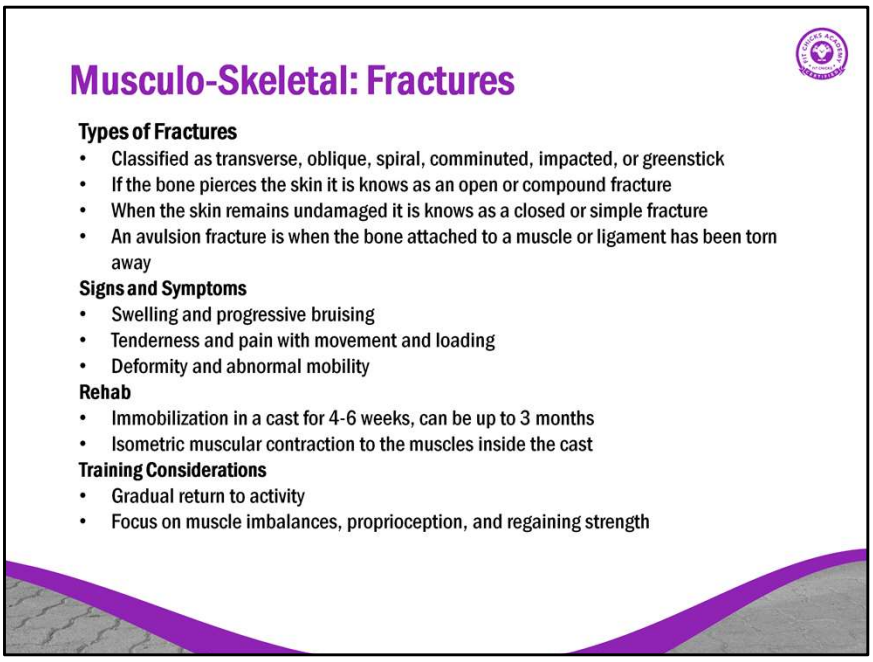

By the time the time you start working with the client the cast will be off and they will have started rehab with physio. Training will be for muscle imblances and regaining strength of the atrophied muscles

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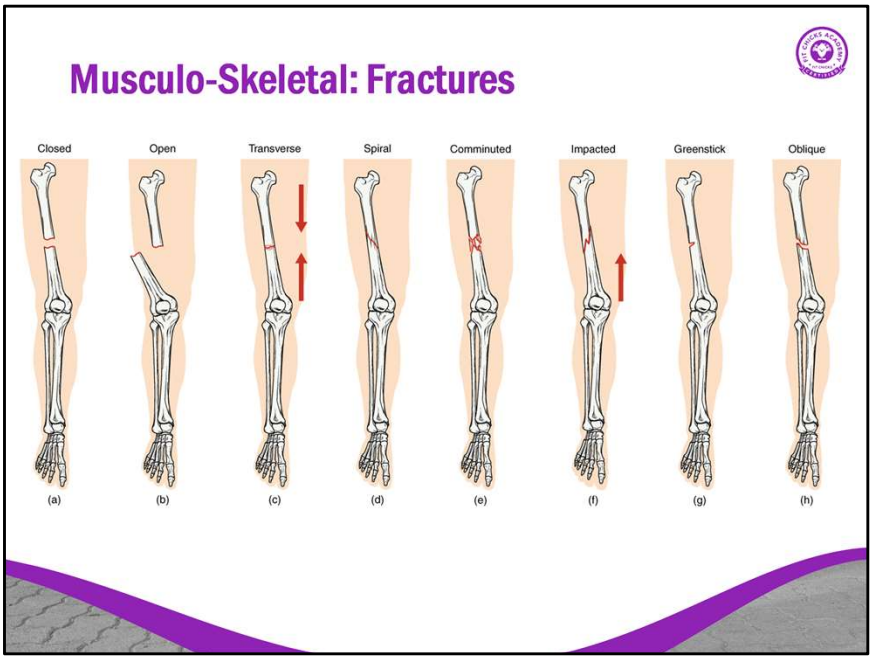

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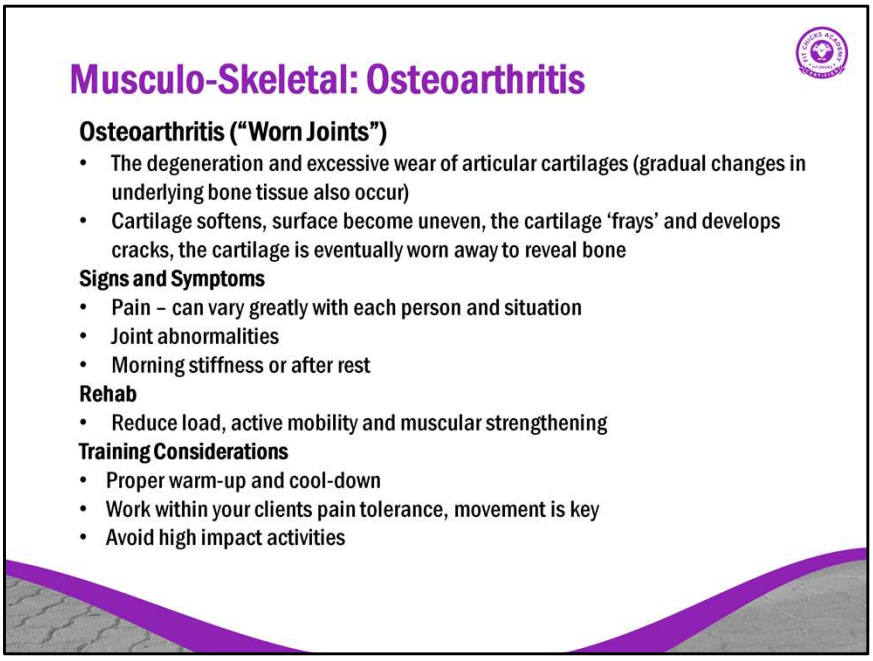
Transverse – a fracture that is at a right angle to the long bones axis
Spiral – a fracture where at least one part of the bone has been twisted
Comminuted – bone has broken into several pieces
Impacted when bone fragments are driven into each other
Greenstick – soft bone frays like a branch when bent (only in children)
Oblique – a fracture that is diagonal to the bones long axis

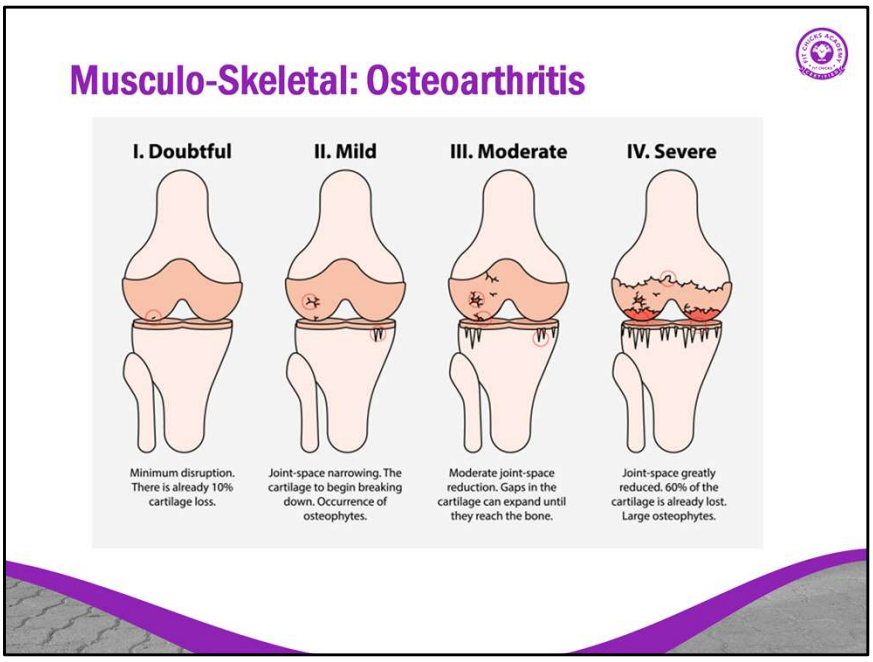


Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg 49-50)

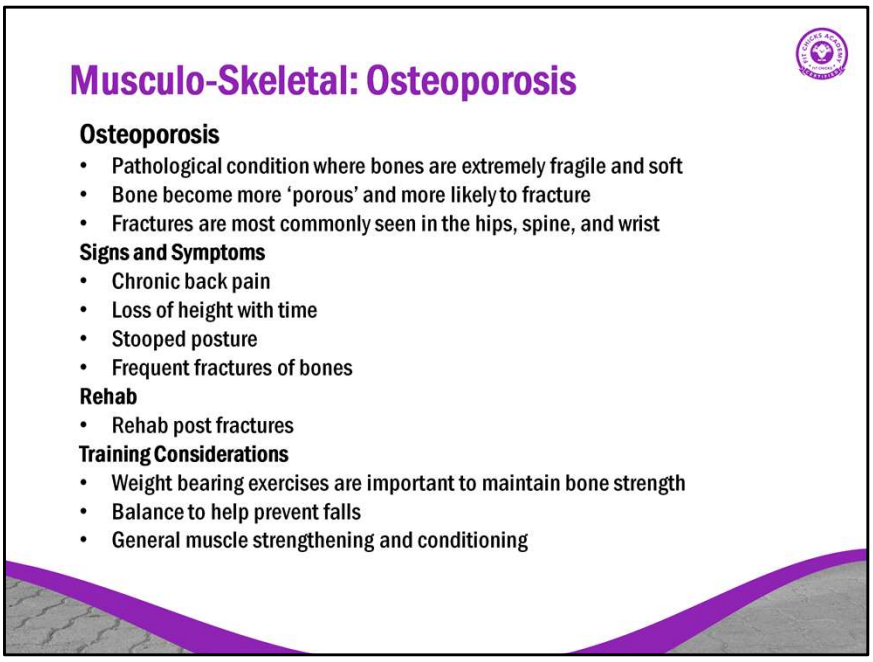
Irreversible

Pain – may go away with warm-up, may get worse, may be present during daily activities, may not.

Movement is key with arthritis, even though it's painful, it's important to keep the joint moving and lubricated. For lower extremity joint, weight management is key to avoid excessive load



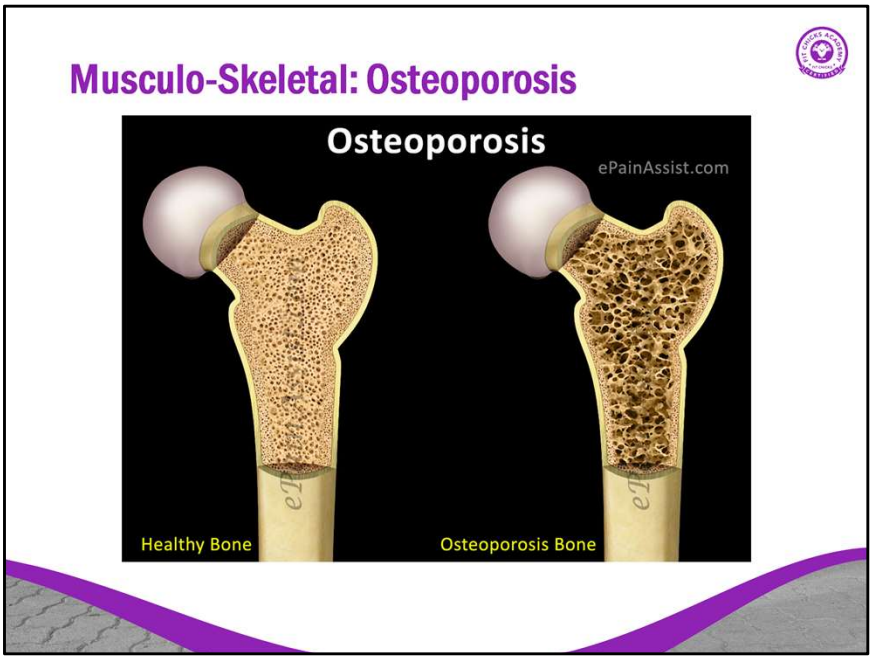
https://www.pthealth.ca/conditions/osteoarthritis/



https://www.epainassist.com/bones/osteoporosis

Avoid back squats – no adding weight to spine

Continuing weight bearing activities will slow down the progression of OP



https://www.epainassist.com/bones/osteoporosis

Musculo-Skeletal: Spine, Back, and Core

Disc Injuries

- Disc bulge – the nucleus leaks fluid out through the damaged layers of the annulus fibrosus causing a bulge or protrusion
- Disc herniation – the very outer layer of the disc (annulus fibrosus) has been broken and fluid (nucleus pulposus) is leaking out

Signs and Symptoms

- KEY – not everyone with low back pain will have a disc issue and not everyone with a disc issue will have low back pain
- Pain can radiate down the leg and cause sciatic pain

Rehab

- Can vary from individual to individual
- Usually involve extension exercises like sloppy push-ups to ease the disc back in
- Avoid flexion type movements which can bulge or herniate the disc even further

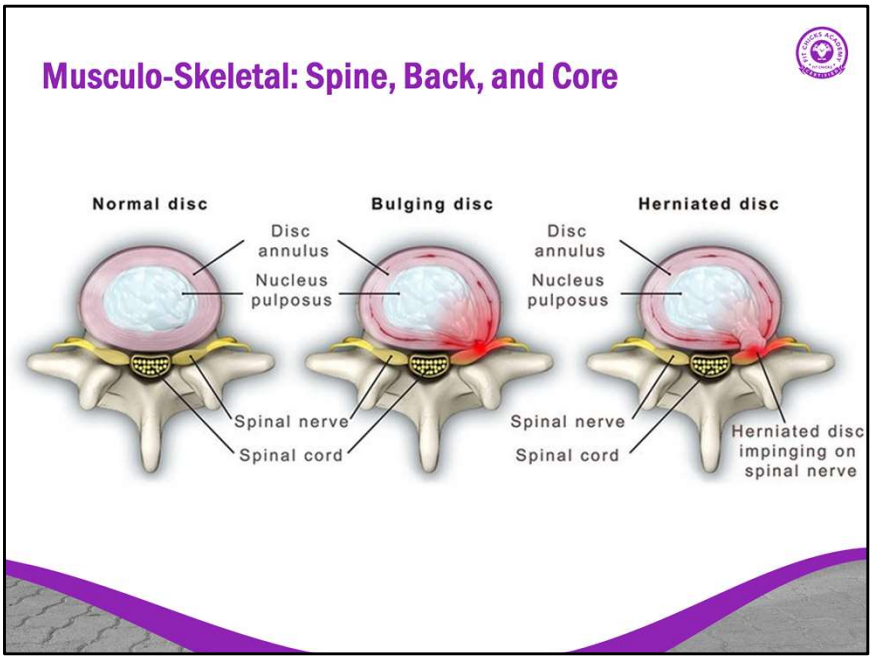
Training Considerations

- Form is crucial, so is core strength
- Same principles as rehab

https://www.brianellicott.com/wordpress/wp-content/uploads/2017/11/bulging-herniated-disc.jpg

Jelly donut analogy
Nucleus pulposus = jelly
Annulus fibrosus = doughy exterior

Limit flexion, especially during acute phase



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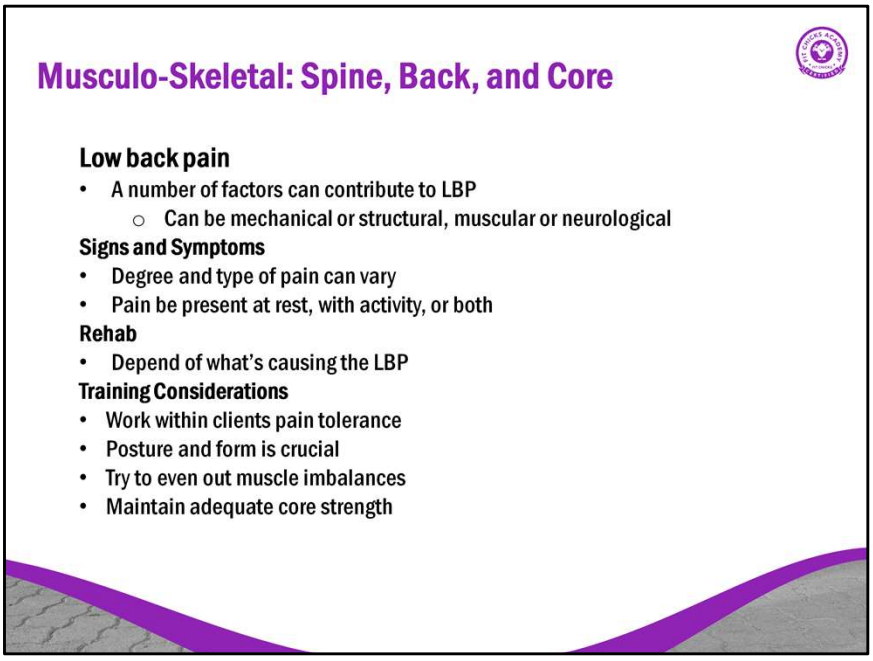
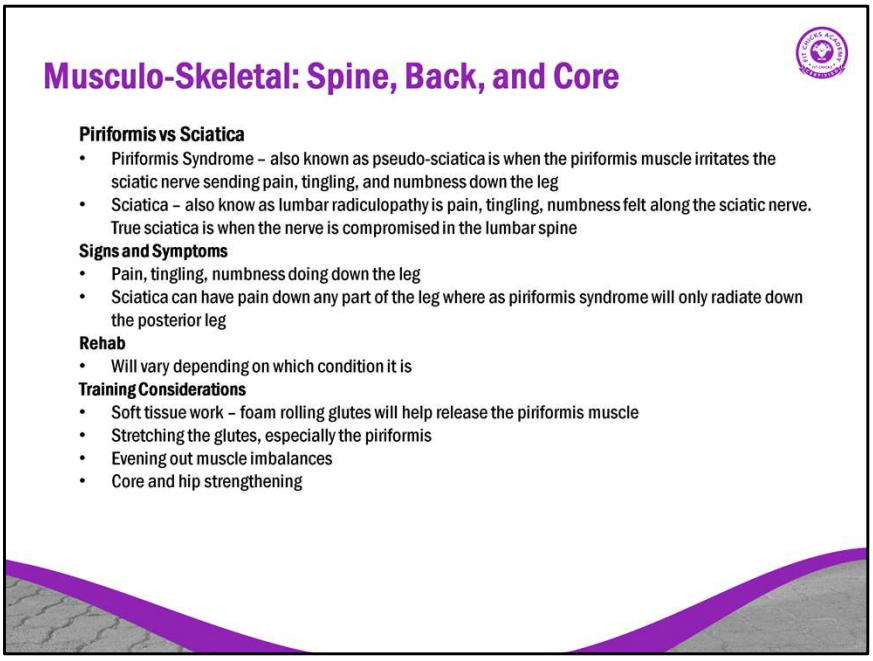


Structural pain can be difficult to work with, if there is osteophyte growth then strengthening won't decrease pain but can help prevent further pain

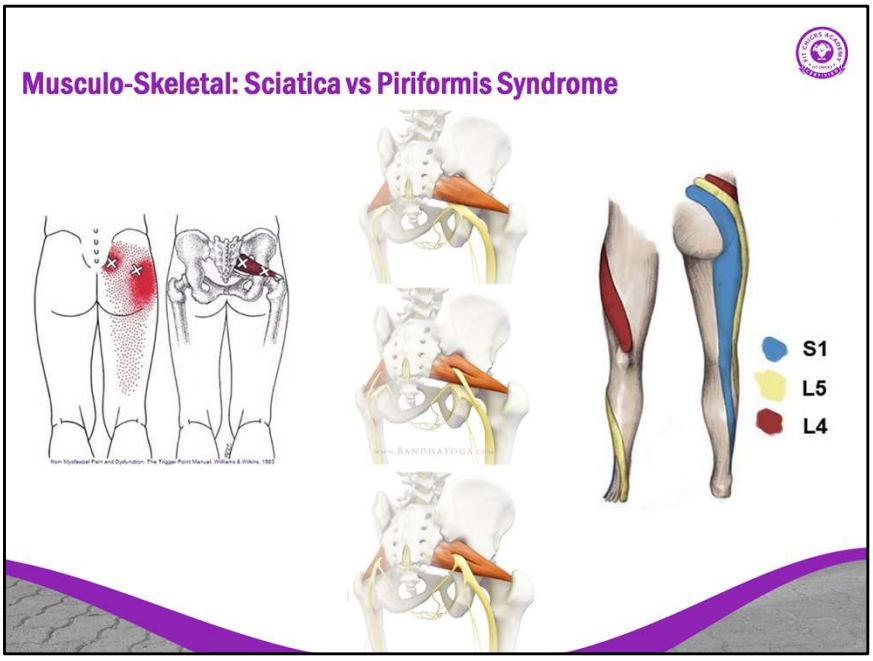
Stuart McGill – 3 exercises that can help with back pain – bird dog, side plank and glute bridge



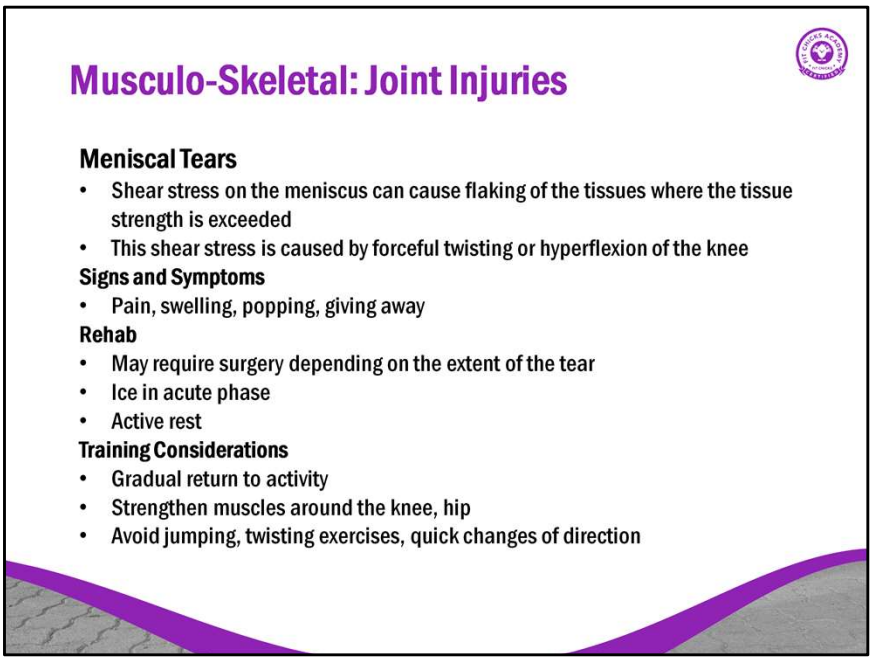
https://www.spine-health.com/blog/piriformis-syndrome-same-thing-sciatica

A piriformis trigger point can also mimic sciatic pain
Avoid movements that trigger sciatic pain – work with your client to figure out what irritates them and what does not

True sciatica can be difficult bc it could be a result of boney growths/osteophytes



http://themassageclinic.ca/blog/sciatica-versus-piriformis-syndromeoakville/
https://hackingwithcare.in/2014/08/piriformis-syndrome-sciatica-pain-relief-with-yoga/
http://www.mkphysio.co.za/wp-content/uploads/2014/01/pain-referral-2.jpg

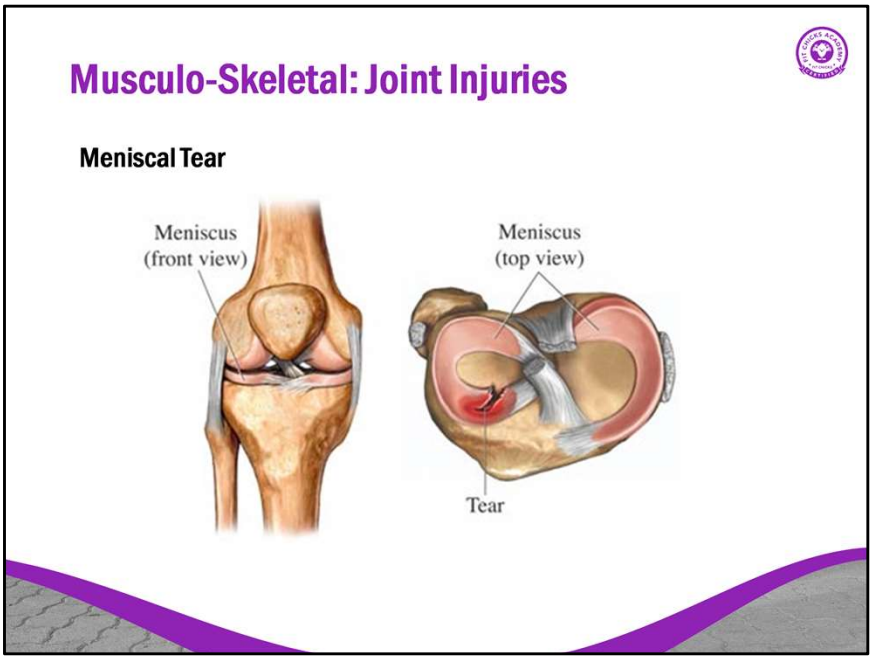


Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg 83)

Meniscus absorb shock, helps femur articulate on the tibia

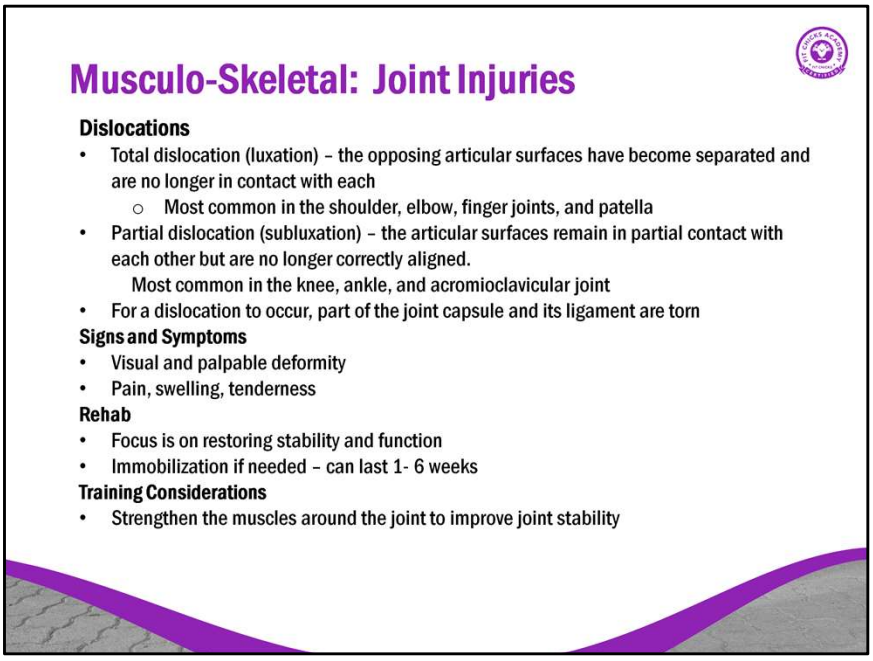
May need a brace, may need surgery depending on extent of tear

Deep squats and lunges may be painful and may need to be avoided during acute phase



http://www.getactivephysio.com.au/wp-content/uploads/2013/09/Meniscus-Tear.jpg

The meniscus is a figure 8 shaped piece of cartilage that sits on top of the tibia, it helps the femur to articulate with the tibia and acts as a shock absorber

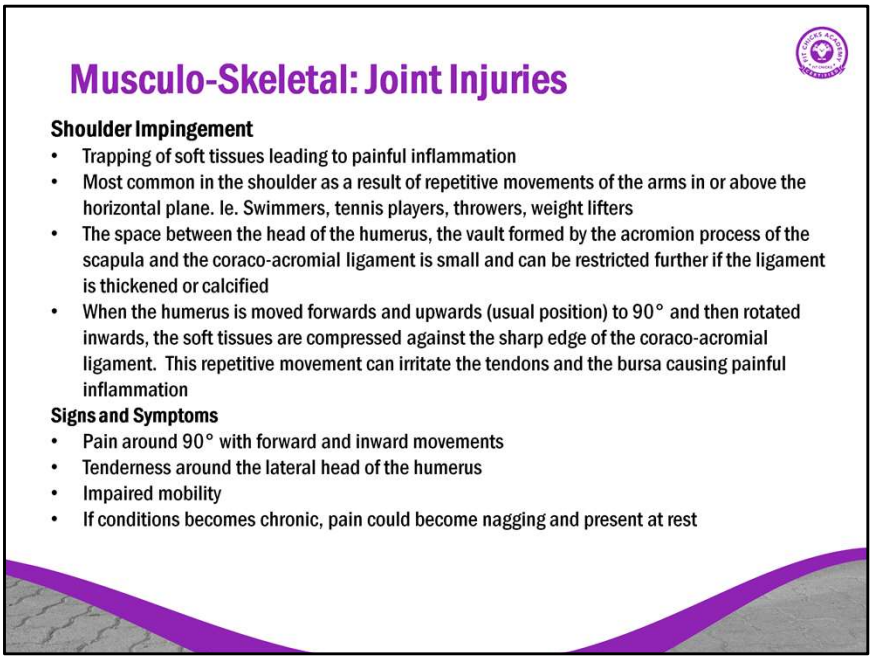


Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg. 25)

Dislocations can be further complicated if nerves and blood vessels are damaged – never reduce a joint by yourself. Go see a Dr.

With a shoulder dislocation, be careful with overhead movements

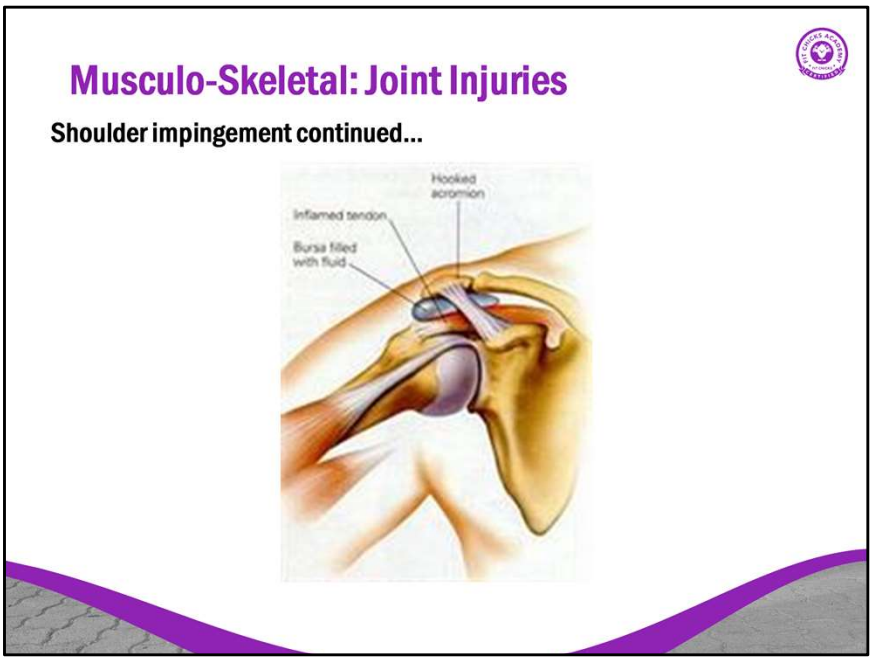
https://lifeinthefastlane.com/wp-content/uploads/2010/01/posterior1.jpg
http://blog.clinicalmonster.com/2016/05/12/shoulder-dislocations-austere-environments-novel-approach/
https://coreem.net/core/true-knee-patellar-dislocations/



Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg 192)

With inflammation the space gets smaller and the condition becomes progressively worse.

Seated posture at a computer – kyphotic upper back, anteriorly rotated/forward shoulders = perfect storm for impingement



Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg 192-193)

https://physioworks.com.au/injuries-conditions-1/rotator-cuff-impingement

Musculo-Skeletal: Joint Injuries

Shoulder impingement continued…

Rehab

- Active shoulder joint movements with proper scapular movement patterns
- Continue with conditioning exercises
- Resume sports gradually when pain is resolves

Training Considerations

- Proper warm-up and flexibility program to prevent condition from occurring and recurring
- Strength training with proper form
- Adequate shoulder mobility and stability

Peterson, L., & Renström, P. (1986). *Sports injuries their prevention and treatment*. Chicago: Year Book Medical Publ.(Pg 192-193)
https://physioworks.com.au/injuries-conditions-1/rotator-cuff-impingement

When acute, avoid overhead movements (flexion,abd above 90 degrees). This isn't forever, before returning to overhead movements, focus on proper scapular movement, shoulder stability, thoracic mobility

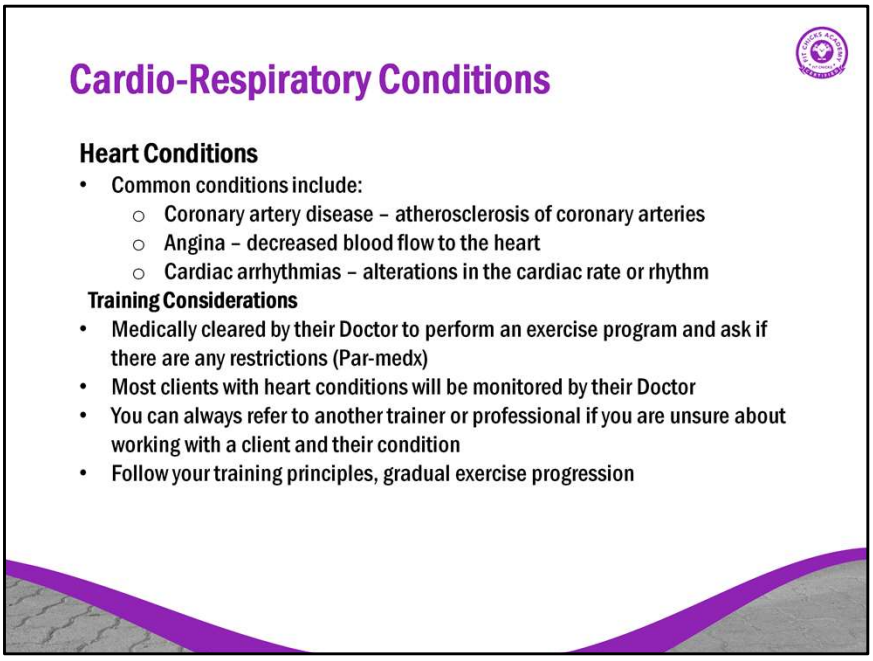
Cardio-Respiratory Conditions

High Blood pressure vs Low blood pressure

- Review: Blood pressure is the pressure the blood in the blood vessels
- Systolic pressure (top number) is the pressure of the blood in the vessels when the heart beats
- Diastolic pressure (bottom number) is the pressure of the bloods in the vessels when the heart relaxes
- High blood pressure – 140/90 mmHg
- Prehypertension - Between 120-139 mmHg systolic and/or 80-89mmHg diastolic
- Low blood pressure – less than 120/80 mmHg

Training Considerations

- Make sure your client is cleared for exercise and being monitored by their Doctor
- Gradual exercise progression is extremely important to not stress the cardiovascular system beyond its abilities
- A client with low blood pressure may experience dizziness with exercises involving getting up and down off the ground



Atherosclerosis – hardening of blood vessel wall

Main conditions you will see. Any other cardiac conditions will move than likely be too far progressed and that person will be working with a cardiac specialist doing a rehab program.

With heart conditions, start slowly, it's better to go too easy or two short than too hard initially.

Don't forget to ask client if they have meds and if they may need to take them during a training session. If so, know where the meds are.

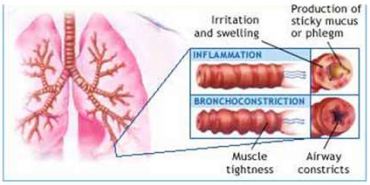
Cardio-Respiratory Conditions

Asthma

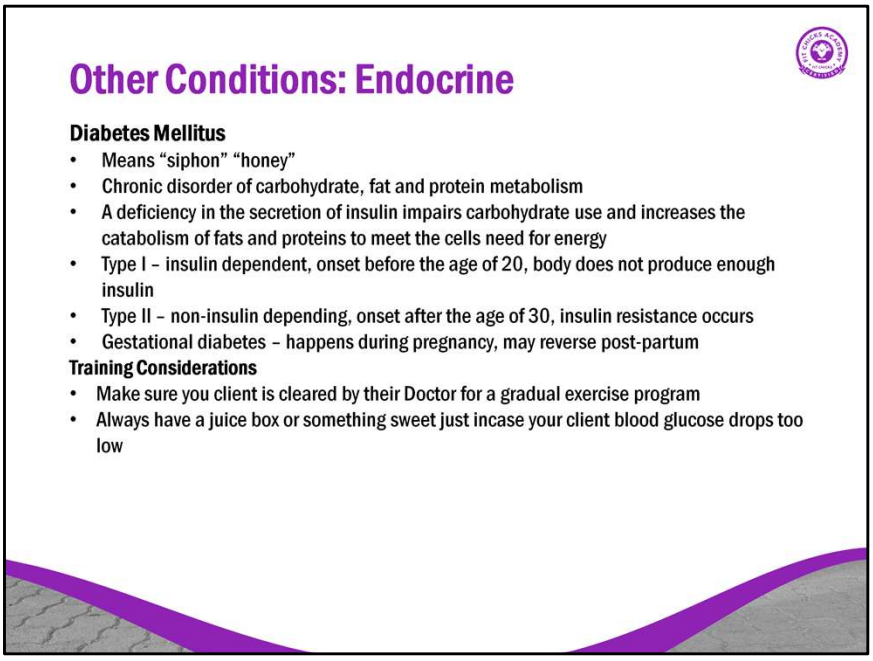
- Chronic inflammatory disease of the airway that causes shortness of breath, chest tightness, coughing, wheezing

Training Considerations

- Make sure your client has clearance from their Doctor for physical activity
- Best options are those with short, intermittent bursts
  - Ex. Volleyball, baseball, gymnastics
- Endurance activities might prove challenging (swimming can be an exception, due to the warm, moist air)
- Cold weather cardio should be avoided
- Make sure your client brings their inhaler with them to all training sessions

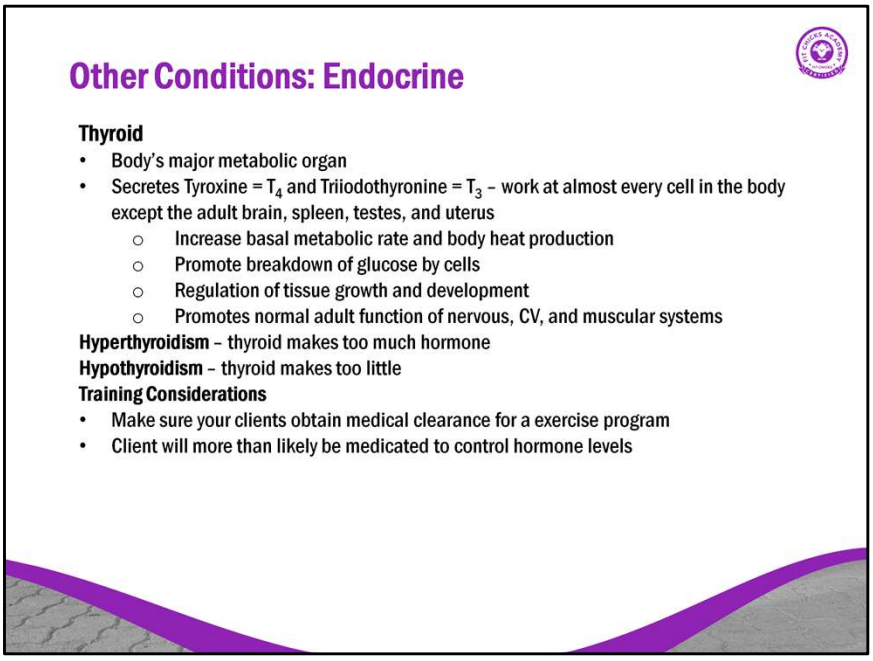


https://asthma.ca/what-is-asthma/



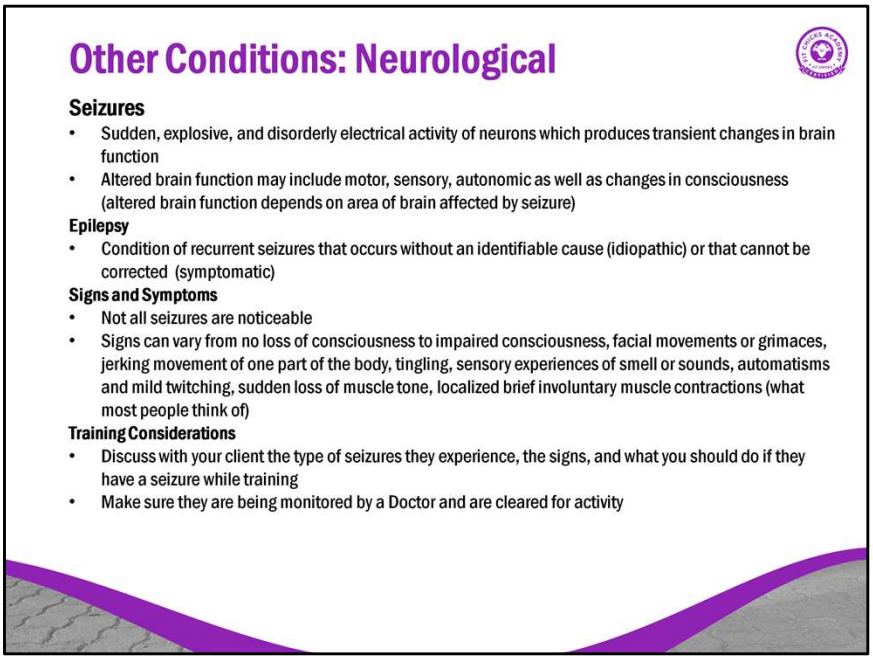
Most clients with diabetes are really good at monitoring their blood glucose levels, especially if they are looking to improve their health and hire a trainer

Hyperglycemia is a indication of diabetes



Breakdown of glucose by cells is what? Glycolysis
If clients are aware of their condition and being monitored by a doctor then they will most likely be medicated

Hyperthyroidism = hard time gaining weight
Hypothyroidism = hard time losing weight



Sensory – for all the Canadians you probably remember the burning toast commercial (or I just dated myself!!)

Other Conditions: Neurological

Concussion

- Momentary interruption of brain function with or without loss of consciousness
- Microscopic changes are usually evident without hours of injury
- Recovery usually within 24 hours
- Different grades of concussion are described based on severity: grade I, II, III, and IV

Signs and Symptoms

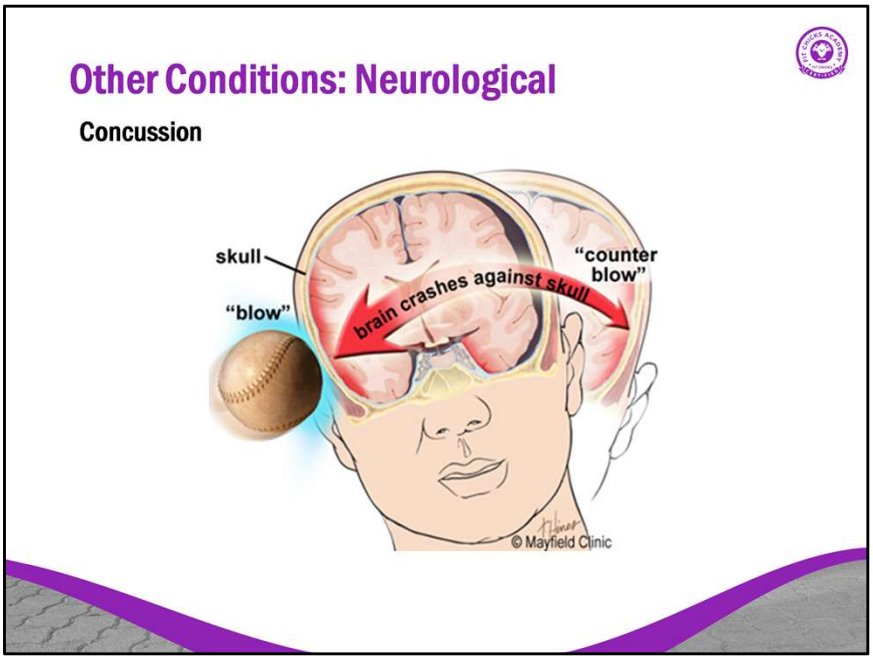
- Confusion, disorientation, and amnesia are possible
- Post-concussion syndrome (PCS) – headache, irritability, insomnia, poor concentration and memory that may persist for months

Rehab

- Will vary depending the severity of the concussion and post-concussion symptoms
- May be working with a concussion specialist

Training Considerations

- Clearance from their Doctor
- Gradual return to activity, work below the level of reproducing PCS symptoms unless directed otherwise by Doctor or concussion specialist



https://mayfieldclinic.com/pe-concussion.htm

Not only do you get a “blow” where the intial contact was but there is also a counter blow on the opposite side of the skull

https://blog.fitbit.com/6-foam-roller-moves-for-every-runner/

While assessing look for muscular imbalances or lack of mobility/flexibility that can be addressed with a training program. This will help with injury prevention

FITT for Cardio

Frequency
- 3-5 x per week

Intensity
- 50-85% of HR Max

Time
- 20 – 45 mins

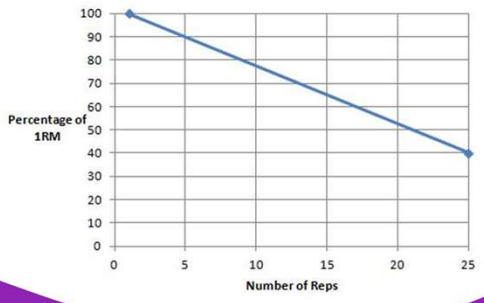
Type
- LISS (50-75%) for cardiovascular endurance adaptations
- HIIT (75-90%) for fat loss and to train for certain sports

FITT for Strength Training

Frequency

- 2 to 4 days a week
- Rest is critical (most of the gains happen during your recovery day!)
- Approximately 48 hours needed before you train that body part again
- More rest is better than not enough rest!

Intensity



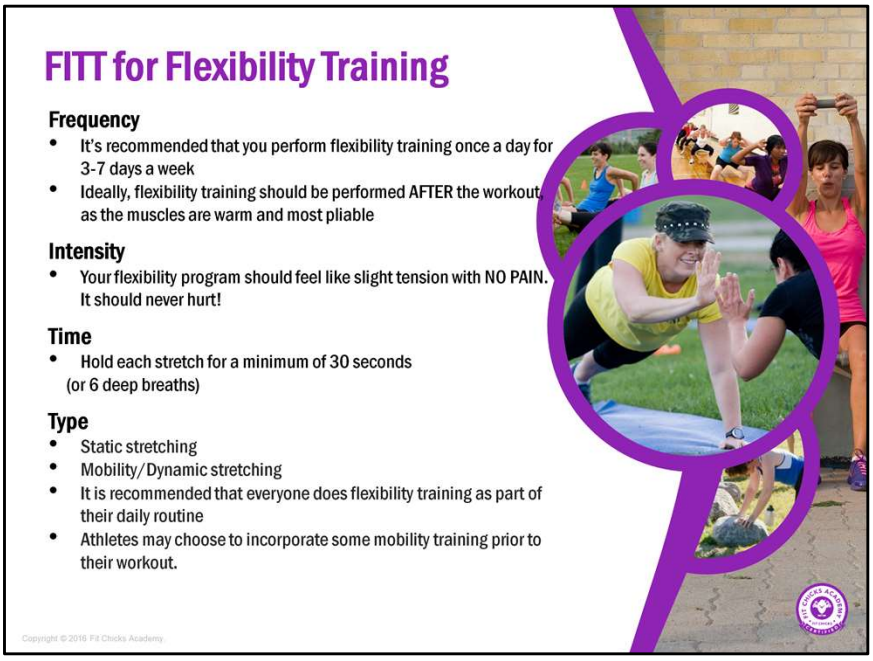
FITT for Strength Training Continued…

Time

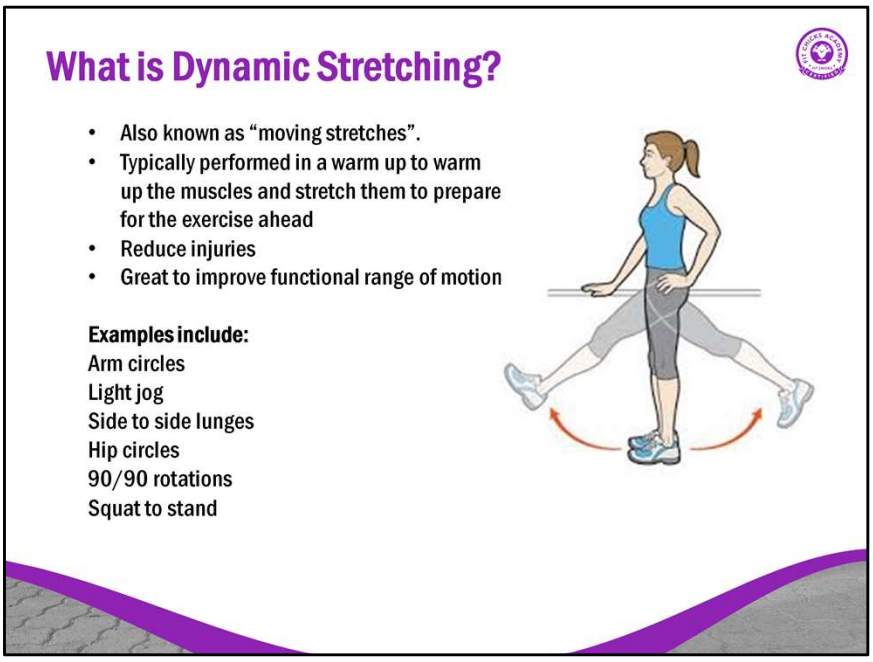
- Rest
  - Between 30 secs (beginner) - 2 mins (Power lifter)
- Tempo
  - 2:0:2:0 or more
  - The more time under tension, the harder it is

Type

- Beginners
  - Free weights, Machines, Bodyweight, Bands, Resistance Balls
- Intermediate-Advance
  - Free weights, TRX, Kettlebells, etc



- http://www.sportsscience.co/flexibility/how-often-and-how-long-should-i-stretch-to-improve-flexibility/

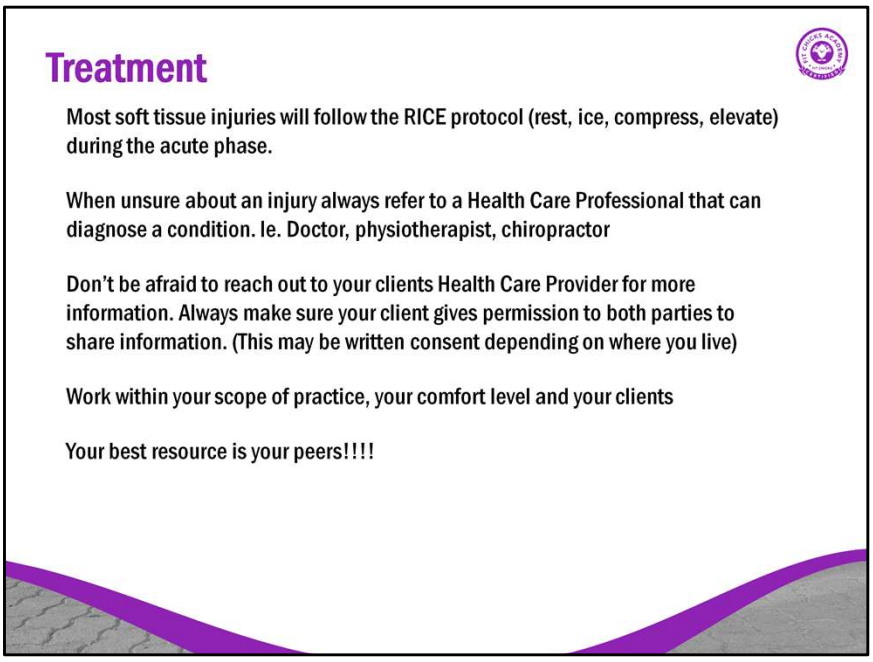


Dynamic Stretching
Dynamic stretching is also known as "moving stretches". These stretches are typically performed in a warm up to warm up the muscles and stretch them to prepare for the exercise ahead and reduce injuries.

Dynamic stretches are also great in addition to doing in a warm up to help improve functional range of motion, mobility in sports and in performing everyday activities.
.
Dynamic stretching is similar to active stretching. However, in dynamic stretching you don't hold the stretch. You are always moving or dynamic

Note that dynamic stretching should not be confused with old-fashioned ballistic stretching (remember the bouncing toe touches from PE classes?). Dynamic stretching is controlled, smooth, and deliberate, whereas ballistic stretching is uncontrolled, erratic, and jerky. Although there are unique benefits to ballistic stretches, they should be done only under the supervision of a professional because, for most people, the risks of ballistic stretching far outweigh the benefits.

http://www.humankinetics.com/excerpts/excerpts/types-of-stretches



Subacute phase will vary depending on the extent of the injury
Treatment is usually a combination of

- Decreasing mm tension
- Increasing mm strength
- Decreasing mm imbalances
- Increasing mm flexibility

Resources

- Instagram accounts to follow
  - @moveu_official
  - @vinnierehab
  - @mobilitywod
  - @thefootcollective
  - @theprehabguys
  - @optimize.physiotherapy
  - @myodetox
  - @thegirlsgonestrong
  - @jamessmithpt (he's a little crude but if you can tolerate it, he does have really good advice)
- Becoming a Supple Leopard by Dr. Kelly Starrett
- Sports Injuries, Their Prevention and Treatment by Lars Peterson and Per Renstrom
- Stuart McGill
- https://www.runnersworld.com/health-injuries/a20812623/how-to-use-a-foam-roller-0/

Recap

TEACHING A MIXED LEVEL GROUP:
- How to offer level systems
- Positive Context

RPE CHART:
- What it is and how to effectively use this tool with clients

MODIFICATIONS:
- Setting clients up for success with injuries or specific requirements

INJURIES:
- Setting clients up for success
- Common injuries and modification options

Recap

- Pathology and Injury
- Musculo-skeletal Injuries
- Cardio-Respiratory Conditions
- Endocrine Conditions
- Neurological Conditions
- Injury Prevention and Treatment
- Resources
- BEGIN ASSIGNMENT #1

Any questions or inquiries,
please email:

fne@fitchicks.ca