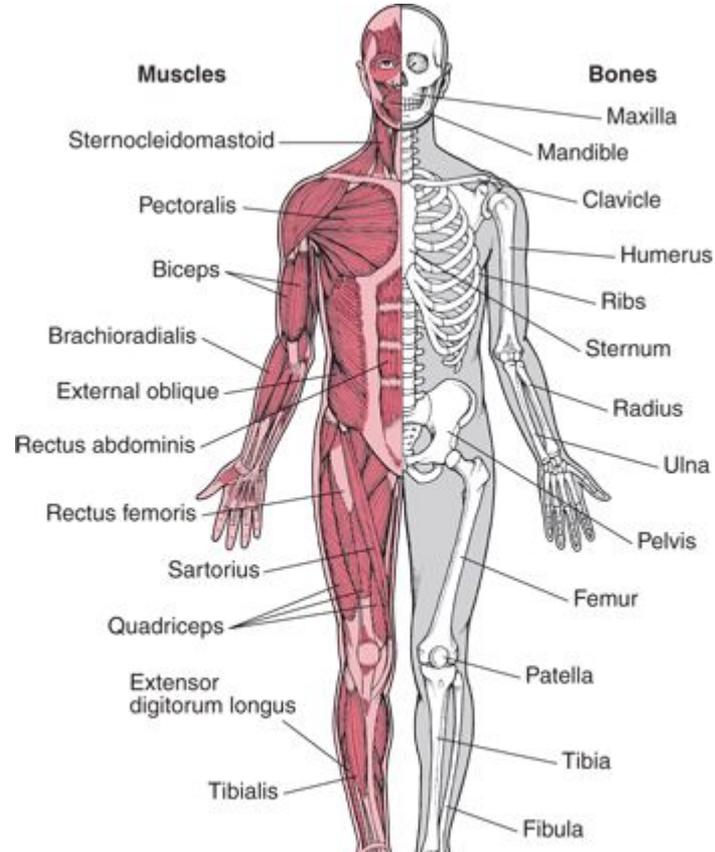
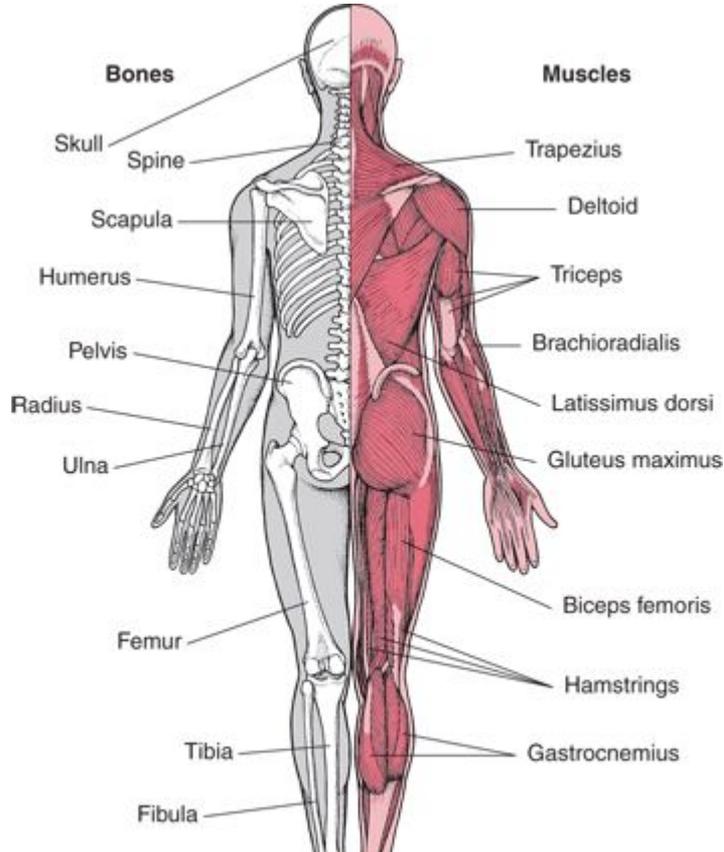


Rugby Skills 11

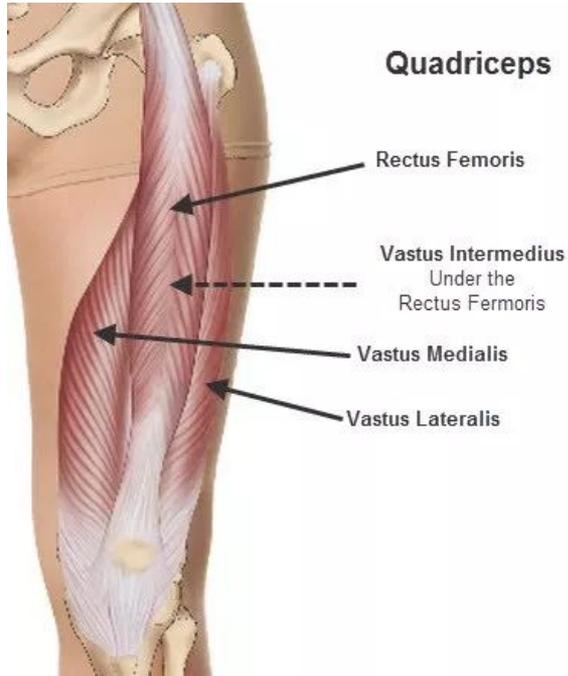
Training Guidelines

Anatomical terminology: know the main components of the musculoskeletal system



How do we train the quadriceps muscle group?

List several exercises that train the quadriceps



Connective tissue: bringing it all together

Tendons

-connect muscle to bone

Tendonitis

-inflammation of tendon

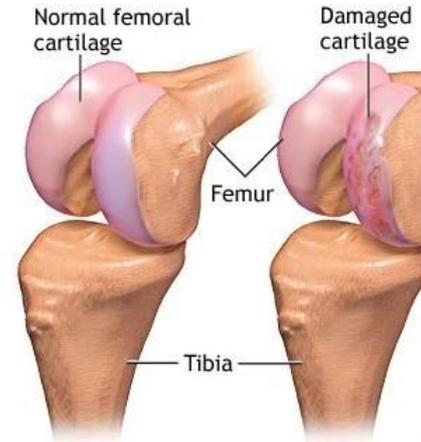
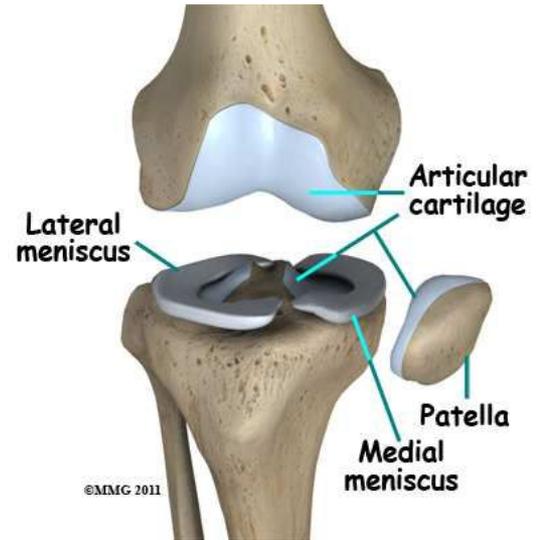


Cartilage

Provides padding between bones
in joints

Facilitates movement

Torn cartilage: may require surgery



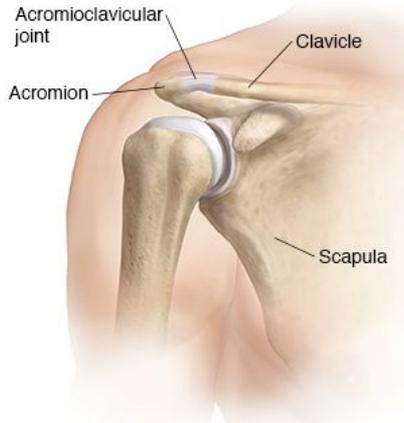
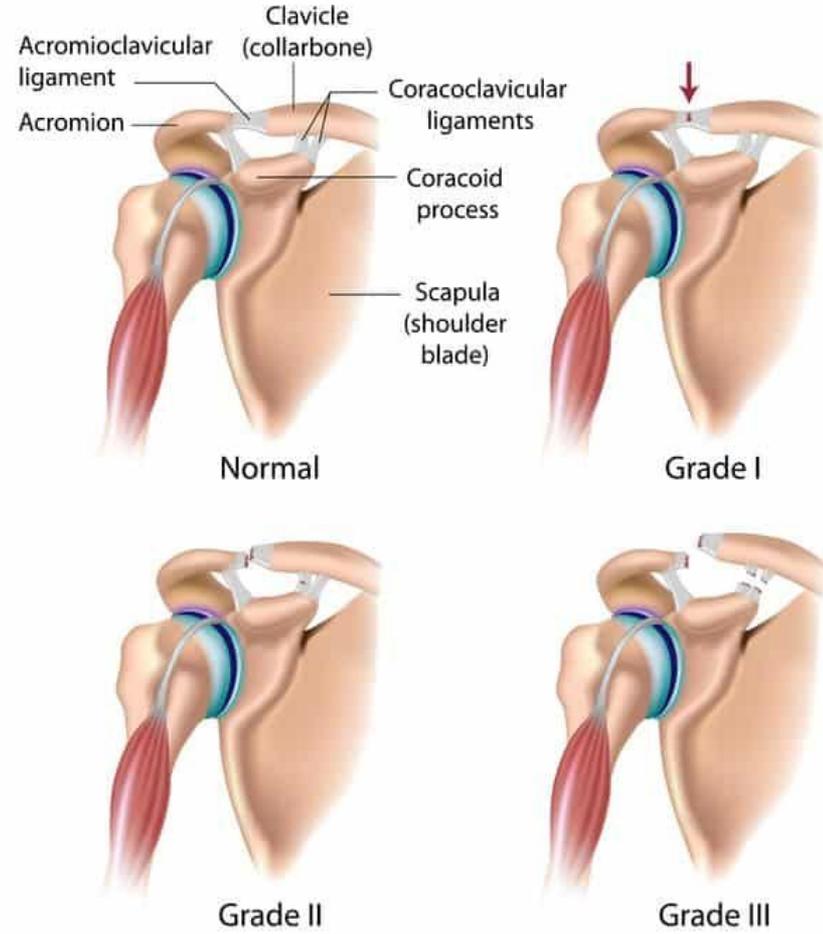
Ligaments

Connect bones together in joints

Sprain: tearing of ligaments

How do we prevent AC sprain?

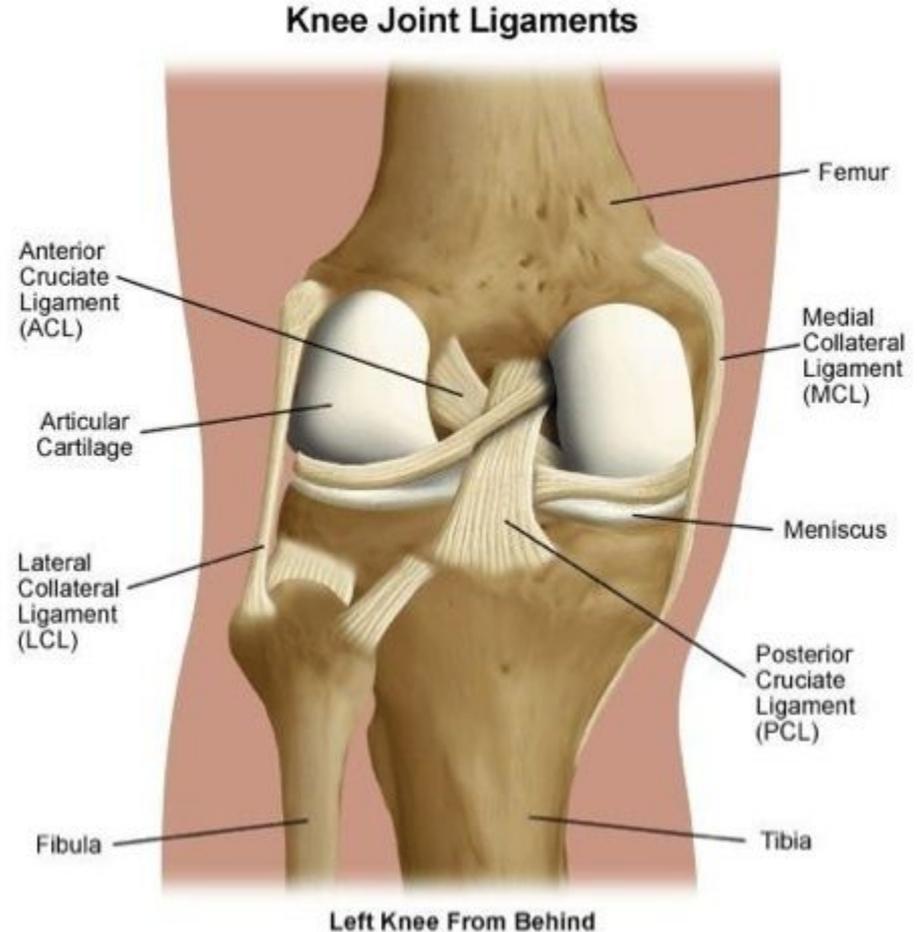
Separated Shoulder



Knee Ligaments

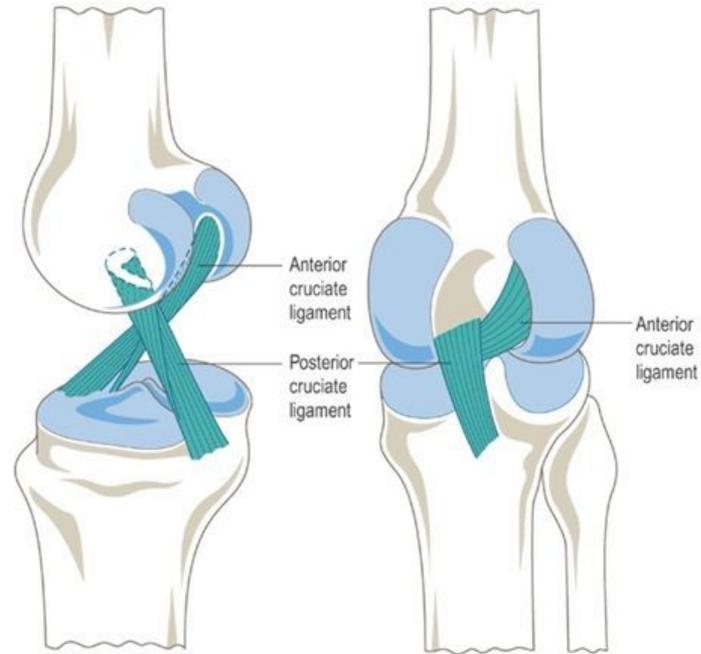
Look up the functions of the four main ligaments of the knee

How can we prevent injury?



Anterior Cruciate Ligament

- Medial tibia to lateral femoral condyle
- 2 bands
 - Anteromedial
 - Taut in knee flexion
 - Posterolateral
 - Taut in knee extension
- Resists anterior translation of tibia on femur and hyperextension of knee



Muscle fibre types

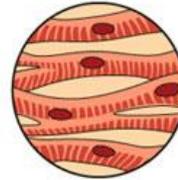
Smooth muscle: internal organs
(involuntary)

Cardiac muscle: heart (duh)

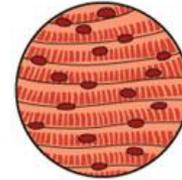
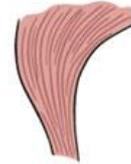
Striated muscle: skeletal muscle
(voluntary)

- Type I: slow twitch fiber
- Type II: fast twitch
- Type IIa vs IIx

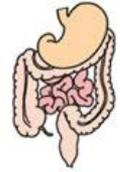
Cardiac muscle



Skeletal muscle



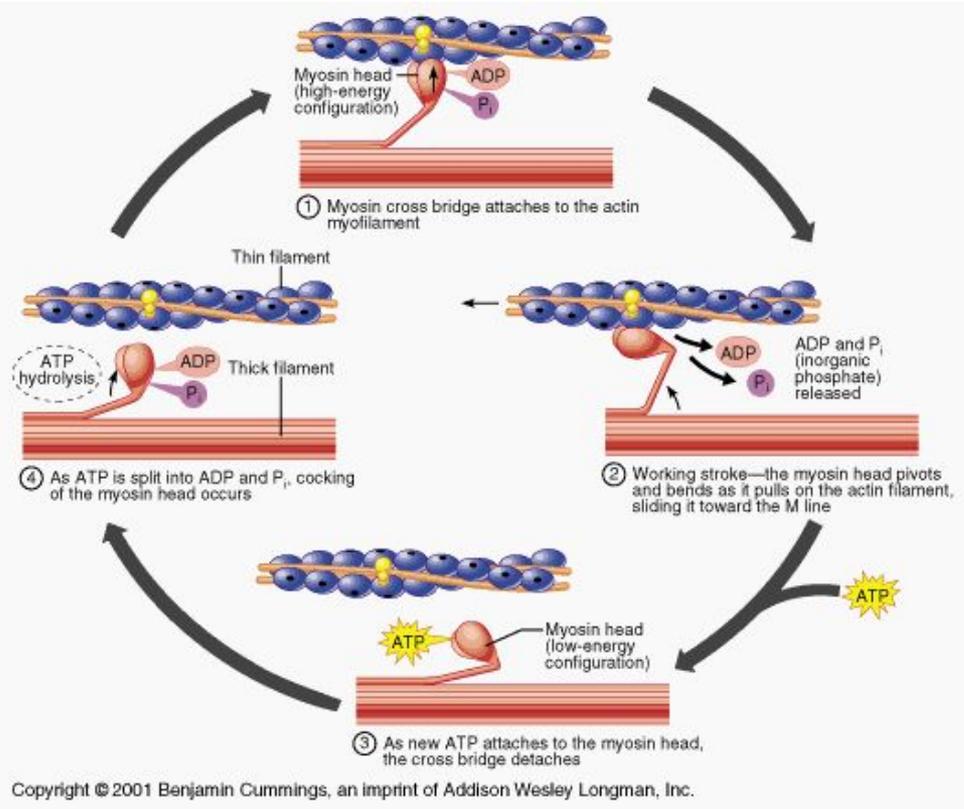
Smooth muscle



Muscle fibre types

Characteristics	Type I	Type IIA	Type IIX
Contraction Time	Slow	Fast	Very Fast
Oxidative Capacity	High	High	Low
Diameter	Small	Medium	Large
Resistance to Fatigue	High	Moderate	Small
Generating Force	Small	Moderate	Very High

How does ATP actually make our muscle fibers shorten?



<https://youtu.be/Ktv-CaOt6UQ>

ATP production

https://youtu.be/00jbG_cfGuQ

Mitochondria Structural Features

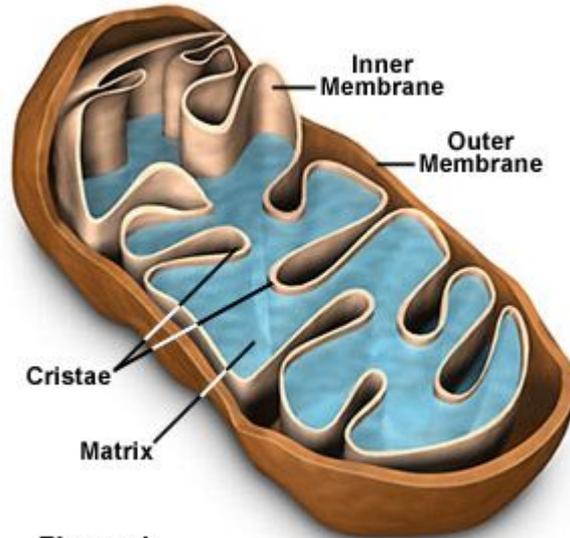
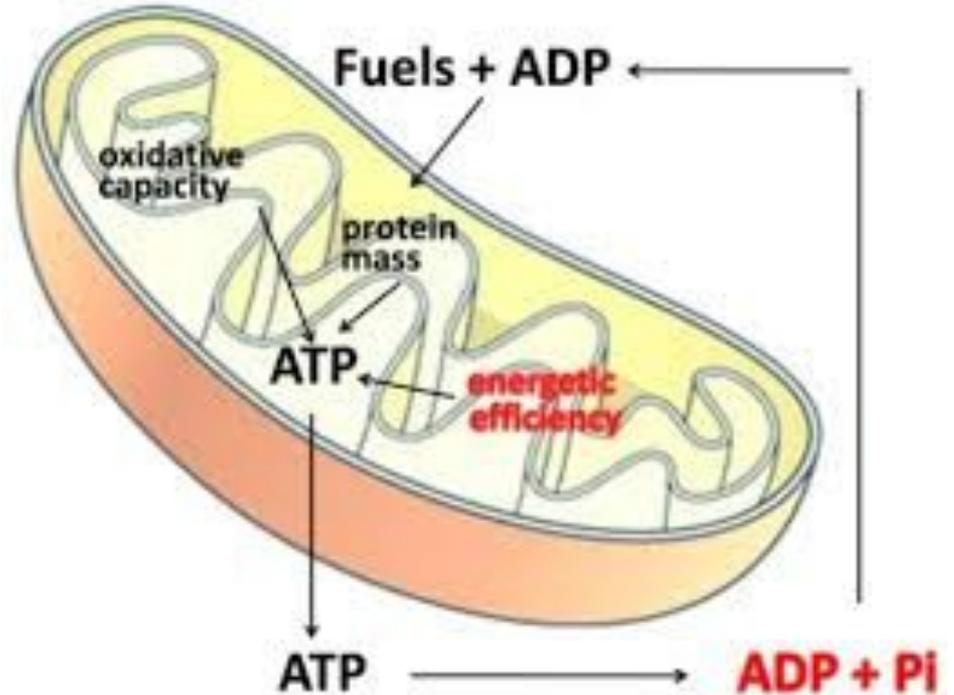
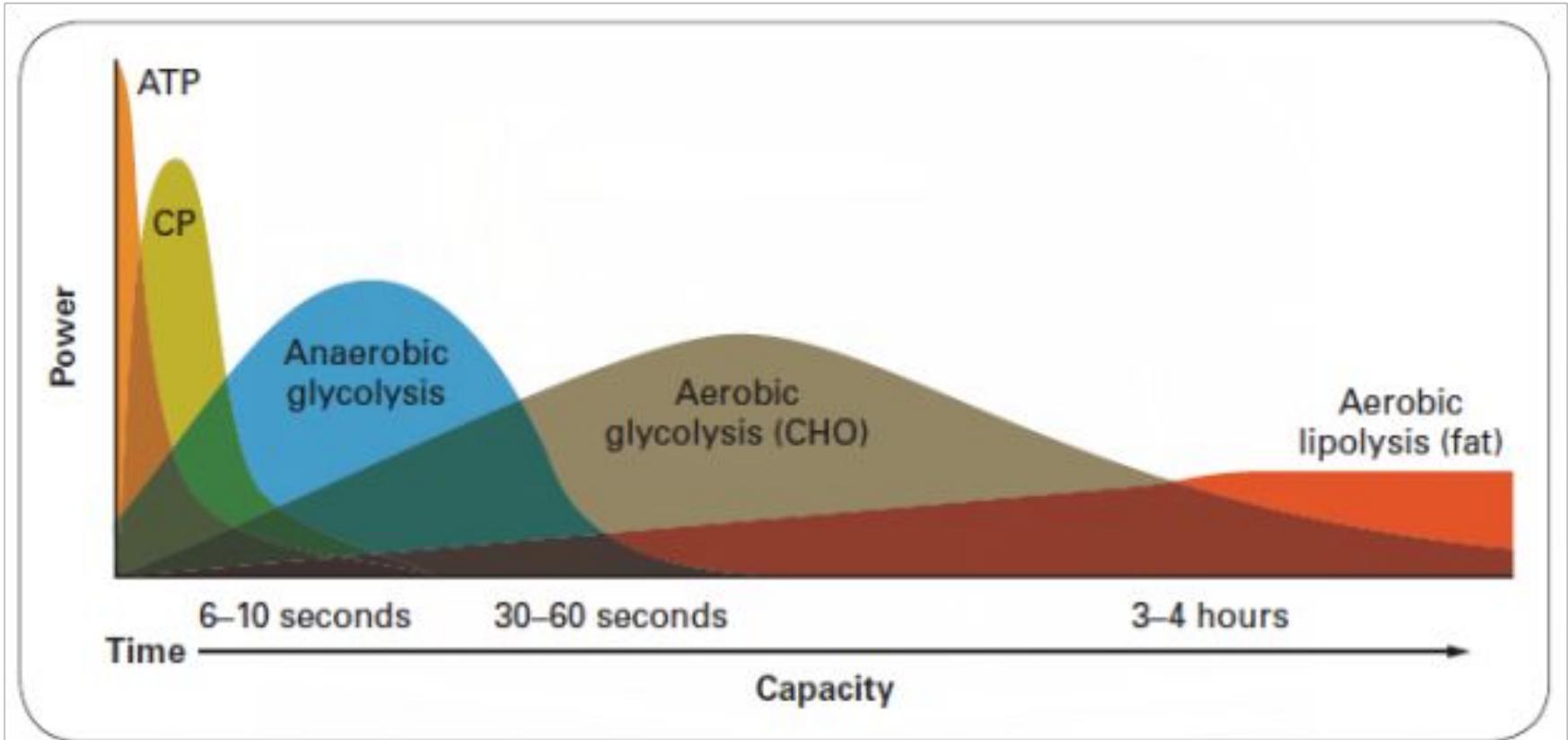


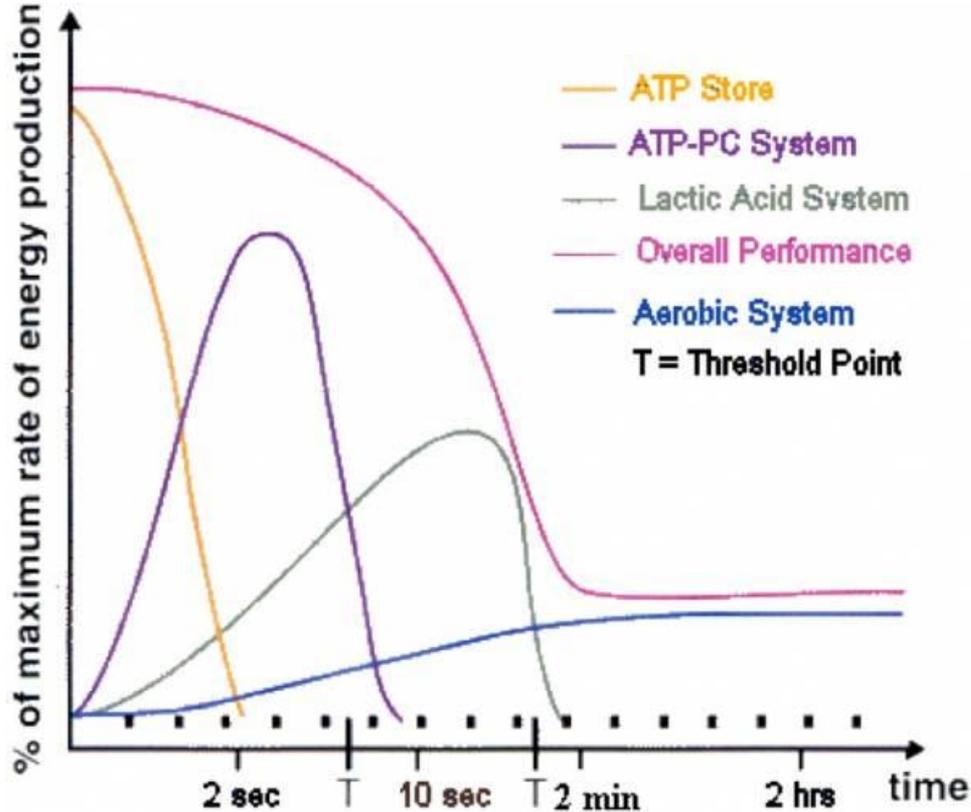
Figure 1



Energy systems



Lactic threshold



After a few minutes, lactic acid builds up in tissues faster than it can be removed

Eventually power output is decreased

This is called the lactic threshold or lactate inflection point

VO2 Max

VO2 Max Tests

Vo2 max	Sport
>75 ml/kg/min	Endurance Runners and Cyclists
65 ml/kg/min	Squash
60-65 ml/kg/min	Football (male)
55 ml/kg/min	Rugby
50 ml/kg/min	Volleyball (female)
50 ml/kg/min	Baseball (male)

Aerobic power can be measured with a VO2 Max test

Can be measured directly or indirectly (beep test)

VO2 Max by position

		TIGHT 4				6, 8 & 2				7 & 9				¾'s & 10		
RATING	VO2	3K	BEEP		VO2	3K	BEEP		VO2	3K	BEEP		VO2	3K	BEEP	
World Class for your position	55.1	11.4	12.5		57.3	11.06	13		60.8	10.3	14		58.5	10.55	13.5	
Graduation level – maintain and move on	54	11.42	12		55.1	11.4	12.5		58.5	10.55	13.5		54	11.06	13	
Adequate for international football – but needs improvement	50.5	12.45	11		51.9	12.24	11.5		55.1	11.4	12.5		57.3	11.42	12	
Needs to improve	48.5	13.1	10.5		50.5	12.45	11		54	11.42	12		51.9	12.24	11.5	

BENCH:

		FORWARDS				BACKS	
RATING	> 190 cms	110-125 kgs	95- 110kgs		>100kgs	90- 100kgs	<90kgs
World Class for your position	160	180	180		160	160	140
Graduation level – maintain and move on	150	165	165		150	140	132.5
Adequate for international football – but needs improvement	140	150	150		140	130	127.5

CLEAN:

		FORWARDS				BACKS	
RATING	> 190 cms	110-125 kgs	95- 110kgs		>100kgs	90- 100kgs	<90kgs
World Class for your position	130	140	150		140	130	120
Graduation level – maintain and move on	120	130	140		130	122.5	115
Adequate for international football – but needs improvement	110	120	130		120	115	110
Needs to improve	100	110	120		110	110	100

SAID Principle

How does the principle of SAID apply to rugby training?

Give an example of an exercise that is an ideal match for each energy system.

Which energy systems should rugby players focus on? Rank for your position :)

Which type of exercise trains which: long distance, Interval training, plyometrics?

Which type of muscle fiber matches each energy system: oxidative aerobic, anaerobic lactic, anaerobic alactic (phosphocreatine)

Game analysis

How many tackles are made? Broken?

How many rucks are won by offence? Lost?

	Tackles (defence)		Rucks (offence)	
Team	Made	Missed	Won	Lost
New Zealand	IIII	II		
Ireland			IIII	II

Game analysis

How many times does your team (on offence)
succeed in making it past the gain line? Fail?

	Offence			
Team	Succeed	Fail		
New Zealand	IIII	II		

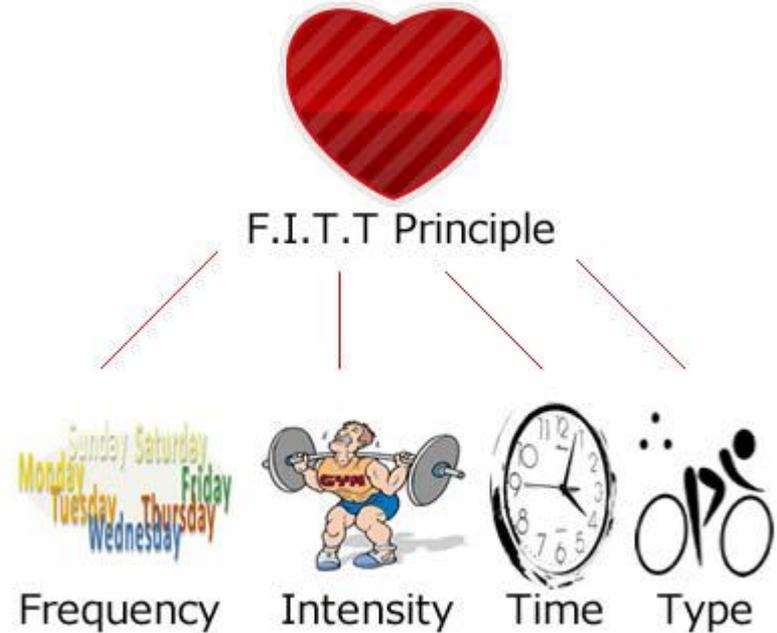
FITT Principle

Frequency: how many workouts per week?

Intensity: what % of maximal effort?

Time: What is the duration of the exercise?

Type: What kind of movements?



Click on an image to learn more about the F.I.T.T. Principle

	CARDIOVASCULAR	FLEXIBILITY	MUSCULAR ENDURANCE	MUSCULAR STENGTH	BODY COMPOSITION
FREQUENCY	<ul style="list-style-type: none"> • 3-5 TIMES WEEKLY 	<ul style="list-style-type: none"> • DAILY • WARM UP • COOL DOWN 	<ul style="list-style-type: none"> • EVERY OTHER DAY WITH WEIGHTS • 3-4 TIMES PER WEEK 	<ul style="list-style-type: none"> • EVERY OTHER DAY • 3 TIMES PER WEEK 	<ul style="list-style-type: none"> • DAILY EXERCISING • FOLLOW CANADA'S FOOD GUIDE • CALORIE REDUCTION OF 500 CAL/DAY IS MAX
INTENSITY	<ul style="list-style-type: none"> • 60-90% OF MAX HEART RATE{21-31 B/10 SEC FOR AGE 14 } 	<ul style="list-style-type: none"> • HOLD 15-30 SEC • TOTAL BODY • 1-3 REPS 	<ul style="list-style-type: none"> • 15 REPS PLUS • <50%MAX WEIGHT • BODY WEIGHT • 1-3 SETS • 8-12 EXERCISES 	<ul style="list-style-type: none"> • 8-12 REPS • 70-90% OF MAX. LIFT • 1-3 SETS • 8-12 EXERCISES 	<ul style="list-style-type: none"> • LIGHT TO MODERATE • HEART RATE 21-31 B/10 SEC FOR AGE 14
TIME	<ul style="list-style-type: none"> • 15-60 MIN OF CONTINUOUS ACTIVITY • PROGRESSIVE 	<ul style="list-style-type: none"> • 10-20 MIN 	<ul style="list-style-type: none"> • 30-60 MIN • PROGRESSIVE 	<ul style="list-style-type: none"> • 15-60 MIN • PROGRESSIVE 	<ul style="list-style-type: none"> • 30-60 MIN • PROGRESSIVE
TYPE	<ul style="list-style-type: none"> • LARGE MUSCLE GROUPS • CONTINUAL RHYTHMIC • RUNNING, CYCLING, SWIMMING • GAMES 	<ul style="list-style-type: none"> • STATIC STRETCH • CONTROLLED DYNAMIC STETCHING 	<ul style="list-style-type: none"> • RESISTANCE TRAINING {FREE WEIGHTS/ MACHINES} • BODY WEIGHT • CIRCUIT TRAINING 	<ul style="list-style-type: none"> • RESISTANCE TRAINING {FREE WEIGHTS/ MACHINES} 	<ul style="list-style-type: none"> • AEROBIC ACTIVITY • WALKING, CYCLING, SWIMMING, RUNNING

Your turn!

Use the FITT principle to design a weekly workout schedule for off-season rugby training (December). Be sure to address:

- What components of fitness should we be focusing on?
- What are some crucial aspects for your own position?
- Do you have adequate rest built into your program?
- How does the program fit into your schedule? Be sure to take school, work, other commitments into consideration

EPOC?

Why are we out of breath after a set of power cleans?

If we use primarily anaerobic energy systems to perform a movement, why should we have an “oxygen debt”?

Answer: We need to bring the body back to a resting state, which means processes such as topping up stores of ATP and creatine phosphate

Oxygen debt is now known as Excess Postexercise Oxygen Consumption (EPOC).



DOMS caused by:

- eccentric muscle action
- structural muscle damage
- inflammation in the muscle
- overstretching and overtraining

Prevented/minimized by:

- reducing the eccentric component
- properly warming up, cooling down after exercise

WHAT IS DELAYED ONSET MUSCLE SORENESS (DOMS)?

Ever feel achy a couple of days AFTER a workout or physically demanding day?

DAY 1

The Workout
You have intense physical activity.



DAY 2

The Calm
You feel tired, but strangely okay.



DAY 3

The Storm of Pain
BAM! You feel incredibly achy and sore. That's DOMS!



Game analysis

How many times does your scrum half (on offence) choose the following options? What factors affect his decision?

	#9			
Team	Run	Pass (open)	Pass (blind)	Kick
Chiefs	I	I /	I	
Stormers		II		I

Sport Psychology: how can we use our mind to help our body?

Intrinsic vs extrinsic motivation

Visualization

Positive self-talk

- Use these principles to design a helpful pre-game routine for yourself



"Your inability to turn off your critical voice, combined with your fear of disappointing your overbearing, demanding father, is causing you to lose faith in your fastball."

Skill acquisition

Abilities have been thought of as stable traits but a more modern perspective understands that people have a genetic potential for each ability and that their level of performance in a particular ability can be influenced by a number of factors such as life experience or coaching.

Skill acquisition

Discuss the differences between a skilled and a novice performer.

-Limit to consistency, accuracy, control, learned, efficiency, goal-directed and fluency.

Describe the phases (stages) of learning.

Cognitive/verbal (early phase), associative/motor (intermediate phase), and autonomous (final phase).

Motor Skill Learning

Learning is a long term change in the ability of an individual to display a particular skill. We can develop motor skill learning with a series of practice sessions specifically targeted towards either the cognitive, associative, or autonomous phase (Williams, 2010). The cognitive phase is characterized by deliberate conscious movement guided mostly by visual cues. During the associative phase, the athlete begins to associate correct movement with proprioceptive feedback and improve from gross motor skill towards fine tuning of technique. If the athlete is able to reach the autonomous phase, the movement has become purely automatic, and the focus switches towards augmented feedback from the coach.

Discuss factors that contribute to the different rates of learning.

3 Limit to physical maturation, physical fitness, individual differences of coaches, age, difficulty of task, teaching environment and motivation.

5.3.6 Outline the types of transfer. 2 Limit to positive and negative, as they apply to:

- skill to skill
- practice to performance
- abilities to skills
- bilateral
- stage to stage
- principles to skills. Refer to an example in each case.

5.3.7 Outline the different types of practice. 2 Limit to distributed, massed, fixed (drill), variable and mental.

Works cited

Williams, J. M. (2010). *Applied sport psychology: Personal growth to peak performance*. New York: McGraw-Hill.