

INJURY PREVENTION FOR THE THROWING ARM



INTRODUCTION

- Overview on the importance of the rotator cuff exercises and scapula stabilizers
 - Why we do them.



ANATOMY

- The muscles that make up the cuff and it's support staff, the scapula stabilizers

Rotator Cuff

S – Supraspinatus

I – Infraspinatus

T – Teres Minor

S – Subscapularis

Scapular Stabilizers

Latissimus Dorsi

Rhomboids

Serratus Anterior

Lower Trap

Pectoralis Minor

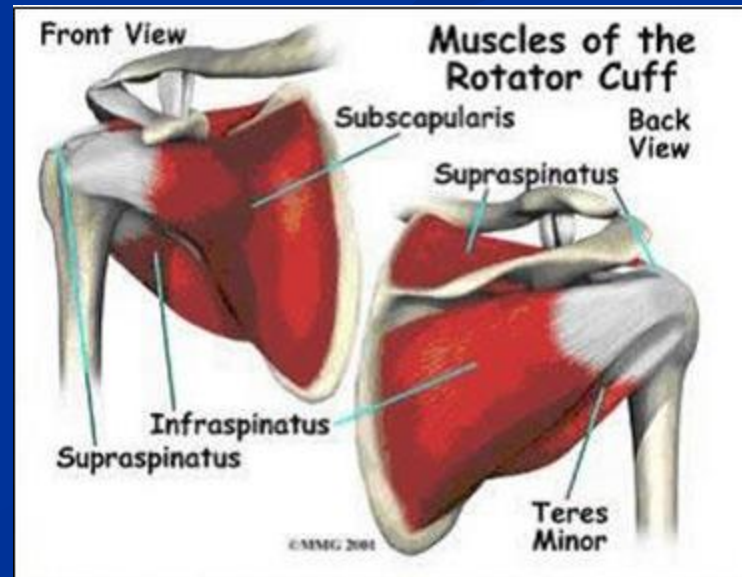
MUSCLE VS FUNCTION

MUSCLE

- Supraspinatus
- Infraspinatus
- Teres Minor
- Subscapularis

FUNCTION

- Abducts arm
- External Rotator of Arm
- External Rotator of Arm
- Internal Rotator of Arm



EXTERNAL ROTATORS

- “The Brakes of the Arm”
- After ball release, the external rotators decelerate or stop the arm much like the parachute on the back of a dragster.

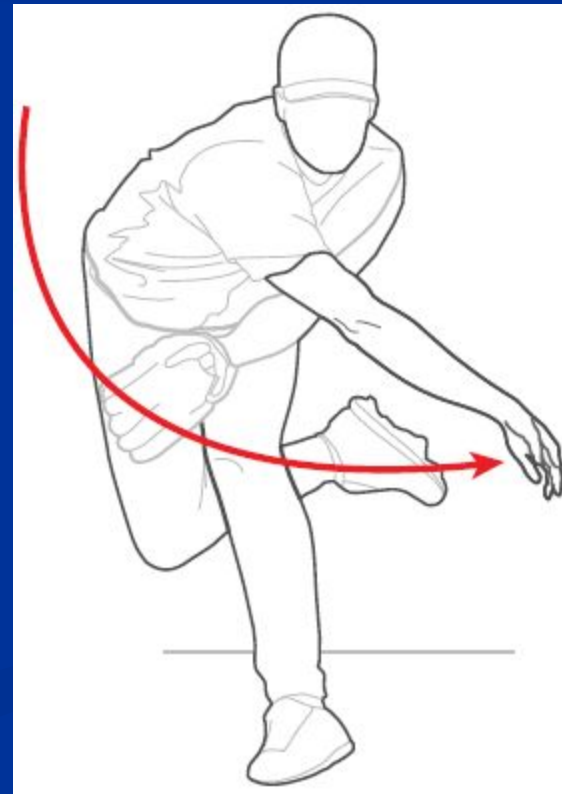


EXTERNAL ROTATORS

- The Brakes
 - Infraspinatus
 - Teres Minor
 - Posterior Deltoid

ACCELERATORS

- Internal Rotators act as accelerators
- Initiate the forward motion of the arm
- Increase Velocity



INTERNAL ROTATORS

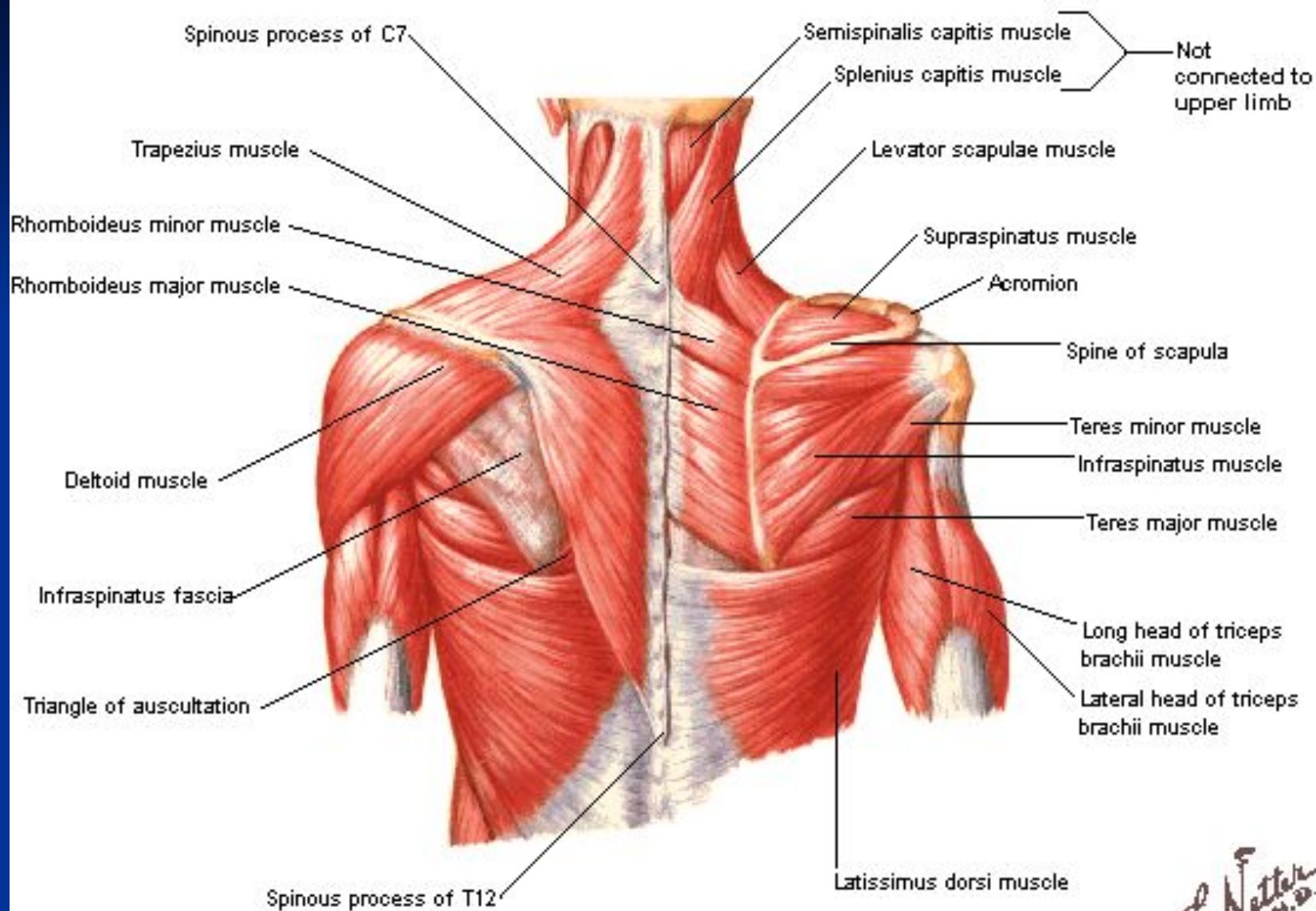
- Accelerators
 - Latissimus Dorsi
 - Anterior Deltoid
 - Subscapularis
 - Pectoralis Major
 - Teres Major

SCAPULAR STABILIZERS

- Act as the support staff
 - Rhomboids – elevation, retraction, and downward rotation of scapula
 - Serratus anterior – Protraction, upward rotation of scapula
 - Lower Trapezius – Depresses scapula
 - Pectoralis Minor – Depresses scapula
 - Deltoid
 - Anterior (front) – abducts arm
 - Middle – (mid) – assists internal rotation of the arm
 - Posterior – (back) – assists external rotation of arm

Muscles of Shoulder

Posterior View



SCAPULA MOVEMENTS

- Scapula Elevation – upward movement of the shoulder blade
 - Trapezius
 - Levator scapula
- Depression – downward movement of shoulder blade.
 - Pectoralis Minor
- Lateral Rotation – Away from spine
 - Trapezius
 - Serratus Anterior
- Medial Rotation – is towards spine
 - Rhomboid major and minor
 - Levator scapula
 - Pectoralis Minor

SCAPULA MOVEMENTS

- Retraction – retracing a punch
 - Trapezius
 - Rhomboid major and minor
- Protraction – punching action
 - Pectoralis Minor
 - Serratus Anterior



WRIST ACTION

- Flexion
- Extension
- Radial Deviation
 - Hammering motion
- Ulnar Deviation
 - Reverse hammering
 - ***most important in pitching**



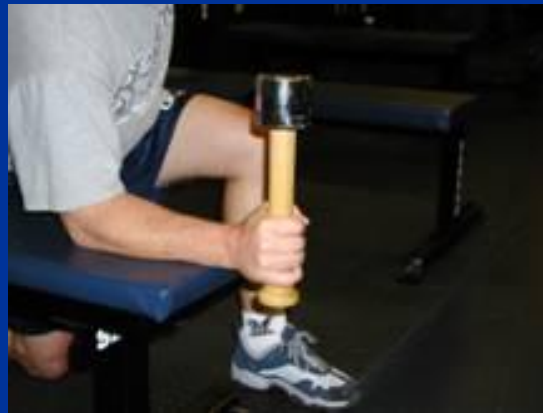
SUPINATION

- Supination – Rotation of the forearm and hand so that the palm is up .



PRONATION

- Pronation – Rotation of the forearm and hand so that the palm is down.



THINGS TO DO

- Work your external rotators – as much as you can
- Pull 3 times more than you push
- Work your scapula stabilizers to take the stress off the cuff
- Train for long, lean muscle.
 - High reps, light weight

THINGS NOT TO DO

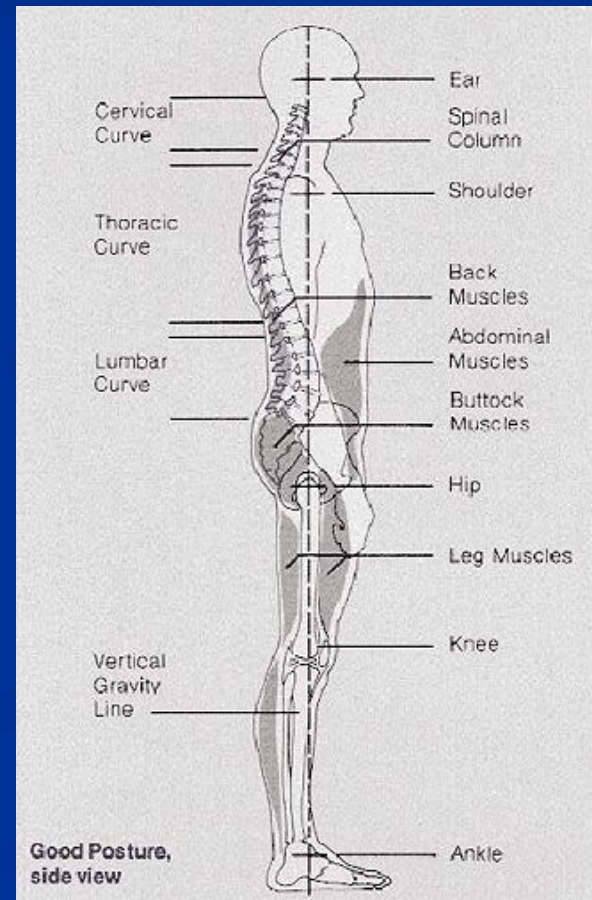
- Do not overwork deltoids – these muscles pull humeral head up into socket (could impinge cuff)
- Do not push more than you pull – you are strong up front naturally, therefore, you would create a muscular imbalance – this in-turn causes a slow bat and possibly throwing arm problems.
- Do not train with heavy weight and low-reps

WAYS TO WORK THE CUFF

- Train for the long haul. Endurance training which the strength coaches will demonstrate
- Train slow and deliberate – tempo 2:4 ratio
- Mix it up with weights, PNF Manuals, and Tubing, etc.
- Stay limber and flexible, do not let yourself get tight – you may need to be manually stretched by a trainer.

POSTURE

- Proper posture in standing and sitting will protect you from abnormal wear and tear.
 - Chin tucked in
 - Retracted scapulae
 - Hip, knee, and ankle in line



FLEXIBILITY AND STABILITY

- Flexibility and Stability of the shoulder is paramount for the dynamic throwing action.
 - The arm is not made to throw, so we have to prepare it for an unusual overhand act in order to have a smooth, injury free delivery.

BALANCE

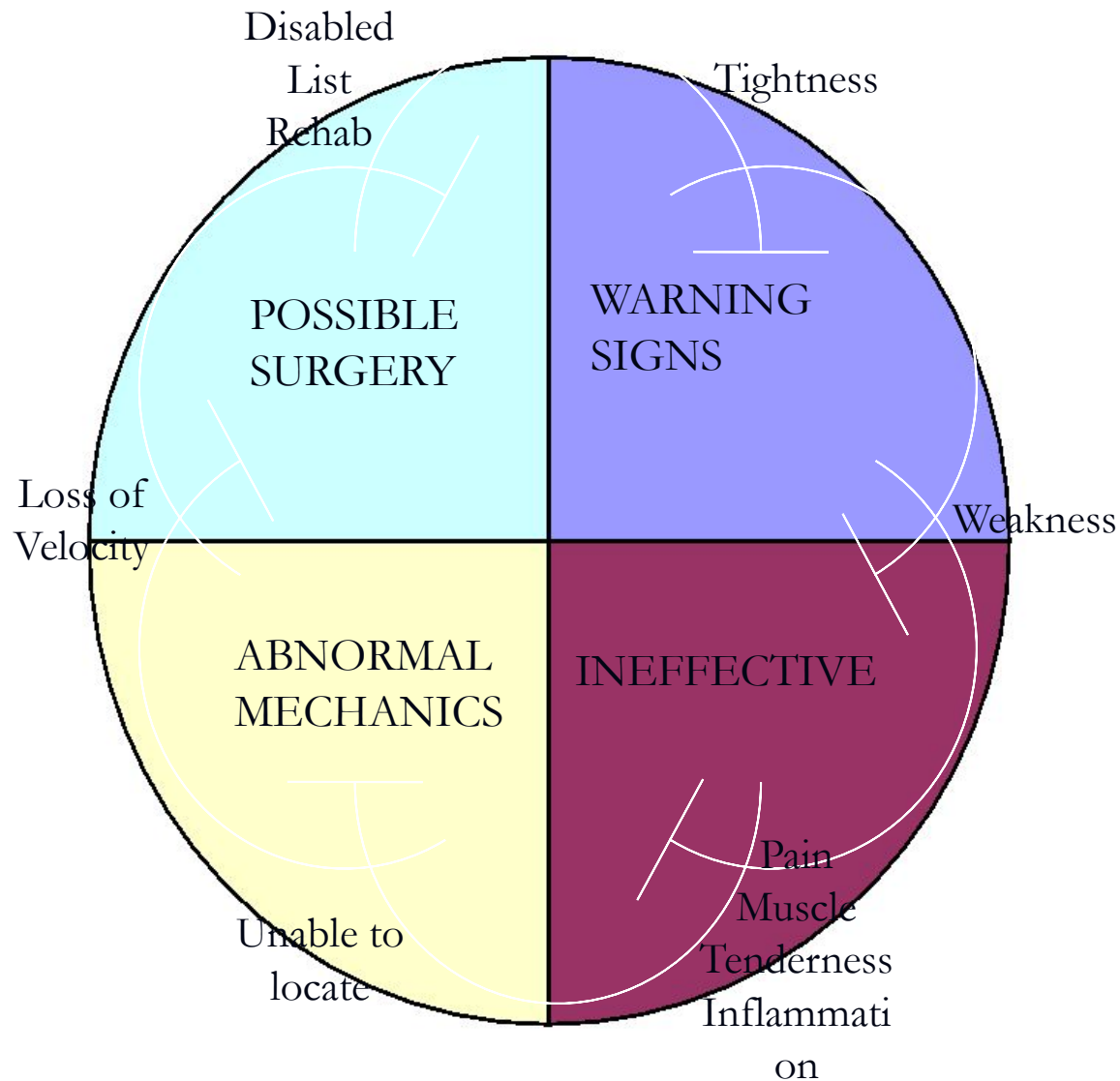
- Good balance between the anterior (front) and posterior musculature must exist so that the shoulder will not be at risk for injury.
 - Naturally strong up front. (pecs, etc)
 - Back gets neglected.
 - Must train posterior cuff eccentrically which we will teach over time.

BALANCE IS KEY

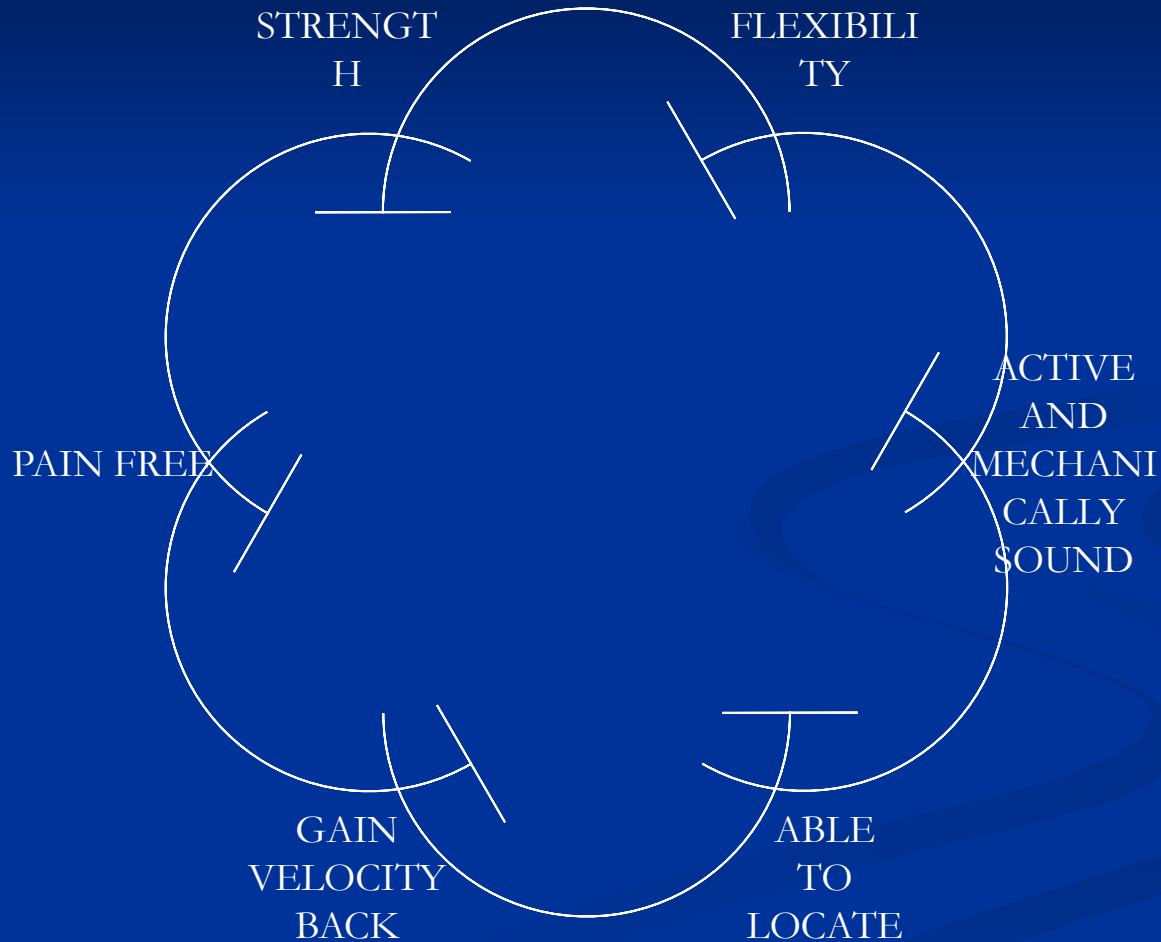
- When we have optimum muscular balance the ball is centered within the socket and is down and back.
- As we become weaker it rides up and forward causing problems that may eventually lead to instability, or a loose shoulder.



CYCLE LEADING UP TO INJURY



REVERSING THE CYCLE!



ESSENTIALS FOR A HEALTHY ARM

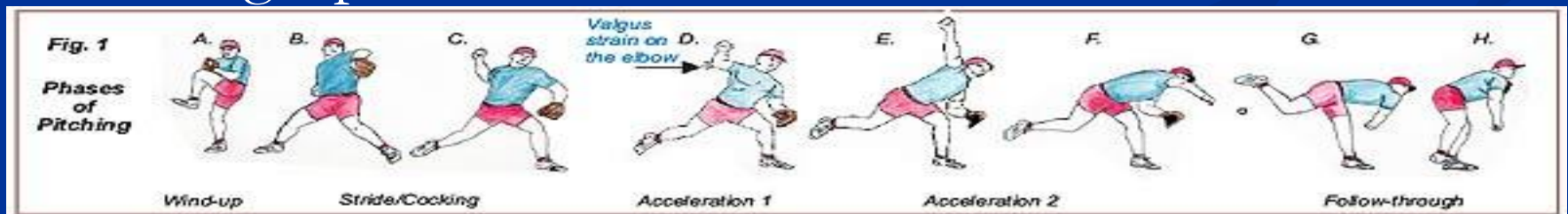
- Mental downtime
 - Rest, and play a leisure sport in the off-season
 - Recognize rest is as important as work
- Year – round conditioning in interval fashion
- Low level off-season conditioning: allow for tissue healing

MUSCLES ARE A TEAM

- Scapulothoracic muscles must be properly conditioned.
- All muscles and joints plus connective tissue must work together, in a kinetic chain fashion to allow the complex throwing motion to be accomplished repeatedly without injury.

KINETIC CHAIN

- The body is one big kinetic chain linked together by muscle and connective tissue.
- These links start from the ground and work up.
- If you have a weak link in the chain, then your power will be short circuited or lost before you can utilize the force in the act of throwing.
- Even with strong arms and strong legs, if you have a weak core, you will lose some power that would be normally transferred throughout the kinetic chain while making a pitch.



MAXIMIZE YOUR OPPORTUNITIES

- We **MUST** train the whole body “link by link” in order to utilize all of the power that can be produced during the throwing, hitting, or running motions.

