

# Gymnastics Medicine: Rehabilitation, Prevention, and Releasing the Athlete

Presented at:

2013 University of Chicago 9<sup>th</sup> Annual Current Concepts in Primary Care Sports  
Medicine

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# Disclosure:

- I have no financial relationships to currently disclose that would bias my presentation
- I will not discuss off label use and or investigational use of any product in this presentation.

# Outline

- Rehabilitation
  - Traumatic Injury
  - Surgical
- Prevention
  - Low back pain – Hinge Theory
  - Ankle flexibility
  - Elbow issues – Pannars, OCD
  - Wrist pain
  - Knee
- Releasing the Athlete- Concerns
  - In the gym at all times
  - Other body parts
  - Same limb strength
  - Aerobic

# Injury Summary

- Most common injuries misdiagnosed by PrimCare:
  - Shin pain = shin splints
    - Really post tib tend
  - Knee pain = patellar tend/ jumpers knee
    - Really is osgoods, bipartite pat, chondo, malalign
  - Back pain = repetitive stress
    - Really is spondy, misdiag on false neg xray film
  - Elbow = insertional tricep tendinitis
    - Really is panners/OCD, you just see S&S of compens
  - Wrist = jamming carpals
    - Really is TFCC

# Part 1: Rehabilitation

- Traumatic Injury
- Surgery

# Rehab Pearls

- If Lower body injury, even in straight leg brace, can still do strength of all EXCEPT knee
- If spine injury, abs are OK to do as well as spine in isometrics
  - Do not force psoas/iliacus work due to tug from anterior attachment T<sub>12</sub> and down
- Return to sport after immobilization requires PT. Joints do not move properly, proprioception is 'off,' neural patterns need to be re-established, and bad habits prevented biomechanically

# Part 2: Prevention

- 1. Back
- 2. Ankle
- 3. Elbow
- 4. Wrist
- 5. Knee

# Prevention: Back

- Abs

- Isometric (hollow holds, bar work) vs. sit up based
- Standard: hollow hold for 10 seconds x level (level 5 = 50 seconds)
- Press handstand – same # as level (most level 8-10 cannot even do 1-2)

- Shoulder flexibility and hip flexibility

- See Hinge Theory information on [Medgym.net](http://Medgym.net)
- Compensation of Verticality (COV)
- Hip flexibility – two joint muscles vs. allowing turnout

# Prevention: Ankle

- Unstable surface training
- Closed eyes = gymnastics is often a blind landing sport
- Strengthening of the calves in BOTH straight knee and bent knee position
  - Back squat with heel raise, front lunge with front foot heel raise
- Flexibility- Closed Chain DorsiFlexion (CCDF)
  - Average human needs 25-30 degrees for proper stooping, stair descending, etc
  - Gymnast needs 45-50 past neutral!
- Shin (ant tib) as much as plantar flexors
- Rolling- suggest TP products (no affiliation!)

# Prevention: Elbow

- Injuries common:
  - UCL and RCL
  - Hyperextension injury
  - Hyperextension ROM allowing ligamentous laxity
  - OCD
  - Pannars
    - Effects the developing bone within the capitellum of the humerus
    - Normal growth on the lateral edge does not happen
    - This results in the bone flattening out

# Prevention: Wrist

- Common gymnastics related injuries:
  - TFCC tear
  - DRUJ injury
  - Hypermobility of the carpals
  - Forearm “splits” (ulna), pulling away of muscles from the longitudinal periosteal tissue of the ulna
- Prevention
  - Flexibility – elbow straight and elbow bent
  - Strength
    - Shoulder- protractors, shruggers, tricep elbow extension (prevention of elbow hyperextension in WB which causes stress to wrist, changes hand positioning, etc.)

# Prevention: Knee

- ACL prevention is key
  - Gymnastics has unilat and bilat landings, and uneven surfaces
- Glut med strength
- Hip ER strength
- Knee not beyond toe position
- Hamstring/quad balance
- Stretching- two joint hip muscles
- Strength- explosive
  - Working eccentric 2x more than concentric
    - This is where injuries happen

# Part 3: Releasing the Athlete

- 1. In the gym at all times
  - Unless there is contagiousness, or post surgical days, the athlete is in the gym with varied goals
- 2. Slow ramp up
  - Latent day to see if DOMS which makes athlete weaker in skill/force production
  - Pain- muscles = OK, bones where injury was/sharp = bad
- 3. Skill Progression
  - Varied surfaces
  - Domino skills
    - Back extension rolls before free hips on bars before Tkatchevs, etc.

# Release Cont.

- 4. Specific Joint Concerns- see following slides
- 5. Jump progression protocol for LE injury (knee, ankle, calf, foot, fracture, post-boot, etc.

# Specific Release Concerns:

## Spine

- 1. Slowly introducing arching/lordosis to the athlete
  - Swiss ball, foam roll, kick overs, back bends on elbows, back bends with partner
- 2. Vertical loading
  - Rebounding surfaces (tramp, TumbTrak)
  - Intro spring board jumping
  - Soft surfaces (ResiPit, 8" over loose foam)
  - Hard with pad (Air Floor, Sting)
  - Hard

# (Spine cont.)

- 3. Proper positioning
  - Inverted handstand position- static proper, or dynamic will only be worse
  - Bars- casting to handstand- need spot, proper shoulder strength so feet do not go backwards beyond vertical to force “arch/lordosis” before proper muscles kick in
- 4. Hip flexor flexibility
  - Watch turn out
  - Back leg position on leaps, backwalkovers, back handspring step outs, layout step out air position (split)

# Spine Techniques

- Taping
  - Vertical CoverRoll, no leukotape necessary
  - Top anchor: rib cage, below underwire level
  - Bottom anchor: skin at/above ASIS/Iliac crest
  - Done in Supine, neutral, skin flacid on abs/ribs
  - Goal: if ribs posterior tilt or hips anterior tilt, or both, tape will “tug” at the skin and be a physical cue for the athlete, who may not know they are doing this

## Specific Release Concerns: Knees

- Watch Hip-Knee-Toe alignment
- Jump Progression (see later slide)
- Check foot position- orthotic
- Make sure gluteals are firing for eccentric control, especially unilateral jump and landing

# Knees: Tricks

- Barefoot Orthotics
  - Measured by PT
  - Sent to company for fabrication
  - Applied to athlete
    - 1. taped on- CoFlex
    - 2. Velcro or glue into gymnastics shoes
    - 3. Tape plus shoe for extra security
  - Goal: align all joints above if foot position/ankle is causing knee malalignment, no matter what the hip strength you provide
    - Why: variable surfaces provide valgus to foot floor angle at times
    - Hips strength of “glutes” as always prescribed, sometimes just not enough to counter gravity + forces

# Barefoot Orthotic Pictures

Orthotic



Applying before tape



# (Orthotics cont.)

Taping with CoFlex



Completed



# Jump Progression

- Leg press partial weight bilateral
- Leg press full weight bilateral + partial weight unilateral
- Leg press over BW Bilat + full BW unilat + low BW jump bilat
- Leg press continues, and raise jump Bilat + add jump low weight unilat
- When reach FBW press Bilat, then progress to standing jump-eccentric and concentric- Double leg up to land bilat, single leg take off to 4" to land bilat
- Single leg Jump on Leg press FBW + eccentric off platform single to single
- Single plane double leg foot jumping, front-back, side-side
- NOW start jogging!
- Start agility (grapevine, jog forward, jog backward, ski jumps, cross front/back jumping jacks, etc.

# Summary

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# CV/Resume

- Former member, USA Gymnastics National Health Care Referral Network, Almost 10 yrs
- Owner/Manager- Accelerated Physical Therapy, Willowbrook/Darien- Through 2011
- Owner/President- MedGym, LLC.
- Writer/Medical Editor- *Inside Publications* (Inside Gymnastics, Inside Cheerleading, Inside Volleyball Magazines)
- Published- *Irish Dance and Culture Magazine, Technique Magazine, USECA*
- Medical Consultant- TumbTrak Products
- National and International Performing Arts Medicine Speaker and researcher