

Gymnast Wrist Information

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Over the last month I have had an increase of questions (and controversy) concerning gymnasts with wrist pain. I decided to refresh myself on the literature to be sure I am "gymnastics friendly" and also "medically sound" with my recommendations. Below is an interpretation of the information. The bottom line is:

Current strategy to treat gymnast wrist if athlete sees Dr. Goldstein:

- a) **Rest phase:** If gymnast wrist is decided the cause for the athlete's wrist pain there will be a period of rest from pounding (it is often casted/braced to ensure they aren't "cheating"-- but using no cast and simply reinforcement and compliance with no impact/pounding would result in the same outcome)
- b) **Return to Sport phase:** There will be a protocol back to sport with least pounding skills first, progressing to more impact skills until back to full sport in about 4 weeks after the rest phase
- c) Total time away from full impact/pounding is approximately 8 weeks in most cases (4 weeks or so rest, and 4 weeks or so slow progress back to sport) Some cases will be longer based on the amount of time to keep the athlete out of pain.
Recurrences of gymnast wrist type pain can occur as long as the growth plate is open and the impact activity is resumed- thus any gymnast who is still growing could get gymnast wrist once, or more than once.
:the more gymnastics friendly medical recommendations suggest a protocol back to gym which starts with minimal pounding and progresses to more impact over several weeks after rest
- d) **Surveillance phase:** Rechecking xrays (to watch the growth plate) throughout the athlete's career is requested (but the majority of athletes don't return for rechecks- which makes follow up difficult)

Bullet Points for Gymnast Wrist

- **What is gymnast wrist?** "Gymnast wrist" (growth plate injury at distal radius) is a real diagnosis- it is pain at the growth plate due to repeated impact (thought to be the cause of injury) to this more fragile area of the radius (the radius endures 80% of the impact forces during upper extremity sport while the ulna endures 10% of the impact, 20% at the TFCC (cartilage))
(gymnast wrist is not when there is pain at the wrist joint (from a sprain, soft tissue injury, or ganglion cyst for example), or pain at the forearm, or hand)- it must be in a specific area to "count" as gymnast wrist and thus some gymnasts have wrist pain for other reasons that would require different treatments. Sometimes gymnast wrist might be "blamed" for a gymnast's wrist pain however another cause may be the source of the pain. **Source: b, e**

GYMNAST WRIST GRADES:

- Grade 0 does not show up on xray but the history and where the pain is diagnoses the cause of pain as gymnast wrist- and treatment should be rest of the growth plate until not painful (a few weeks perhaps) before a gradual return to impact sport
- Grade 1 does show up on the xray as a growth plate injury (haziness or widening of the growth plate sometimes requiring a comparison view of the uninjured wrist to see the difference as it can be subtle) and a longer treatment time is necessary (perhaps 4-6 weeks- or more depending on the source read- before gradual return to impact restarts

- Grade 2 has more extensive xray changes of the growth plate at the radius (cystic changes, sclerosis) and this may require more time off of sport (amount of time varies depending on the source read) for the growth plate to rest/heal **Source: b**
- **What is ulnar variance positive?** Ulnar variance is a measurement of the height of the ulna in comparison to the radius in a patient/athlete. In a typical patient the measurement would be ulnar variance neutral- less than one millimeter difference between the radius and ulna. When the ulna is greater than 1mm longer than the radius it is considered ulnar variance positive. Some patients with ulnar variance positive will have stress injuries to their hand (the carpal bones) (ulnar impaction syndrome) and/or tears of cartilage in the wrist (TFCC tears). Surgery is required to fix these issues if they arise. While difficult to prove, research suggests that previous gymnast wrist injuries (growth plate injury to the distal radius) in some athletes cause the radius to stop growing (or grow at a slower rate) than the ulna resulting in ulnar variance positive problems once the athlete is mature (the growth plates are closed). Patients with ulnar variance positive could also have a genetic risk (unrelated to the sport or injury). **Source: b, d**

- **What the research says about treatment and possible prevention**

- Repeated xrays to see if the distal radius growth plate healed and is growing at the same rate as the ulna is recommended (I offer it every 4-6 months or so if the athlete is in the sport and has open growth plates) **Source: b**
- The research **doesn't** state if braces during exercise is helpful (like Tiger paws)- but it also doesn't say that it isn't helpful and perhaps should be considered in certain circumstances **Source: a, b**
- The research **doesn't** say how long to protect the growth plate in a gymnast wrist type injury to decrease the risk for ulnar variance positive (that may require surgery) down the road (if indeed ulnar variance positive is an outcome from gymnast wrist)
 - Some doctors will protect for 4-6 weeks (or until pain decreases) then progress slowly back to sport (especially with Grade 0 and I), the literature doesn't state this is "the right amount of time" to protect
 - Some doctors will protect for much longer, up to 4 months out of the sport, the literature doesn't state this is "the right amount of time" to protect, (the research is vague if longer times of protection is indeed helpful to decrease the possible "negative outcomes" in the long term) **Source: a**
- **What the research says about risk**
 - Training load (and hours) do not directly correlate with risk of ulnar variance positive but some research considers longer training hours a possible risk to getting a gymnast wrist type injury **Source: e**
 - Some studies suggested taller, older athletes had more problems than younger, shorter athletes
 - Some research suggests genetics could contribute to ulnar variance positive and not only impact/ pounding is a possible cause **Source: b**
 - Gymnasts between 10-14 years old complain about gymnast wrist type pain more frequently than other age groups- therefore growth spurts (and activity at the growth plate during this time) could be a factor **Source: a,b,c**
 - The height/weight/ and age (and perhaps even genetics) of the athlete may have more to do with ulnar variance (changes in final ulnar length compared to the radius): rather than the skills, hours, or level of the athlete **Source d,e**

- **The research doesn't state that those with gymnast wrist (growth plate changes to the radius) will have ulnar variance positive in the future** (or those found to have ulnar variance positive have it because of a previous gymnast wrist- as there are other possible causes of ulnar variance positive)
 - In fact two research studies oppose each other with that question-
 - **DiFiori et al** found that the growth plate injury to the distal radius (suspected during impact in gymnastics) resulted in the ulna longer than the radius once the growth plates closed (ulnar variance positive)
 - **Claessens et al** reported that the ulna becomes relatively shorter (not longer as reported in the previous research study) than the radius in follow up xrays compared to initial xrays four to five years later in gymnasts
 - So if you are confused (and perhaps it seems that medical recommendations conflict with this topic depending on where your athlete gets care)- it would seem, the researchers seem confused as well! **Source: a, b**
- Xrays are found abnormal in about 10-13% of gymnasts that have NO symptoms of wrist pain at the growth plate(would you treat these athletes for gymnast wrist?- I wouldn't) **Source: b**
 In another study: 67% of those gymnasts **with** wrist pain had xray changes noted but 31% of those **WITHOUT** any wrist pain also had xray changes noted **Source e**
- Up to 80% of gymnasts complain of wrist pain during their career. Some of these are from gymnast wrist- some are from other causes NOT related to the growth plate at the distal radius. Which ones deserve minimal treatment (such as lowering numbers of impact skills in the gym for a period of time) and which deserve conservative treatment (casting) is largely dependent on the diagnosis (is it truly gymnast wrist or another cause of wrist pain), the stage of gymnast wrist (use xray as a guide - along with the story and physical exam), and the risk the athlete and family is willing to take after educated on the research- which is not absolute (as well as the risk the medical provider is willing to take considering the vagueness of the medical literature).
 A small percentage of athletes (braced or not braced) will have long term problems, some of which result in surgery due to ulnar variance positive (and could have originated from previous gymnast wrist type injuries among other possible etiologies coinciding with the athlete's sport). **Source: a,b**

Perhaps it depends on which medical provider the athlete chooses to go to : the doctor's recommendations will "be right" (even if it differs from another medical provider's recommendations) when dealing with gymnast wrist because there isn't convincing research to prove one doctor's recommendation is wrong (or right)!

Goals from my perspective as a gymnastics interested doctor is a balancing act of considering the available science/research, weighing the athlete's risks with benefits, and offering an individual plan:

1. **Protect the growth plate as much as reasonable to allow for normal health of the radius**
2. **Listen to the goal of the athlete- educate the family and weigh**
 1. **the risk of possible (yet difficult to prove) ulnar variance positive as a consequence from a gymnast wrist injury (if indeed the cause/effect relationship exists) with**
 2. **the athlete's goals in the sport of gymnastics (realize that return to impact makes if plausible for return of a gymnast wrist type injury)**

3. **Don't injure something else because the athlete is not doing a skill properly due to their hurting wrist**
 4. **Limit pain during sport to keep the athlete from burning out, or not having fun, or not realizing their potential because of an injury that could be treated (rested)**
Indeed "overtreatment" (removal from sport beyond what is necessary) can similarly effect an athlete's attitude (burn out, not having fun, not realizing their potential)
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Studies read to create this email

- a. Gymnastic Wrist Injury, Sports Medicine Rep, 2008
- b. Wrist Pain, Distal Radial Physeal Injury, and Ulnar Variance in the Young Gymnast, American Journal of Sports Medicine, 2006
- c. Nonspecific Wrist Pain in Gymnasts and Cheerleaders, Clinical Sports Medicine, 2015
- d. Gymnasts wrist: an epidemiologic survey of ulnar variance and stress changes in elite female gymnasts, American Journal of Sports Medicine, 1994
- e. Wrist Pain, Distal Radial Physeal Injury, and Ulnar Variance in the Young Gymnast, Does a Relationship Exist? American Orthopedic Society of Sports Medicine, 2002