

GROWTH PLATE INJURIES

A GUIDE FOR CLIMBERS, COACHES, AND PARENTS



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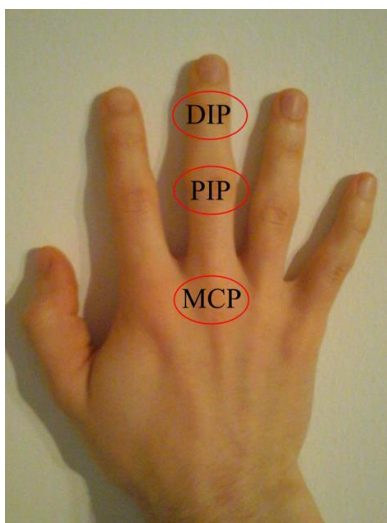
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1. WHO IS AT RISK?

Commonly known as Growth plate injuries, Primary Periphyseal Stress injuries (PPSI) usually occur in teenage climbers at the time of the pubertal growth spurt, often around the timing of breast growth for girls and pubic hair in boys. The key joints for concern in climbing are the fingers. The fingers don't finish growing until around age 17. PPSI's are a serious injury and must be treated as such.

2. WHAT CAUSES GROWTH PLATE INJURIES?

PPSI's of the finger are most often reported in the middle and ring fingers because they are the longest. They tend to affect the finger joint nearest the hand, the proximal interphalangeal joint or PIP joint. These injuries often result in a fracture although they may present in other ways. They are not unique to the fingers of climbers and may be seen in other sports and in other joints.



Joints of the fingers: the PIP joint is the joint most commonly damaged.

The bone grows from the growth plate and is weakest at this point. Growth plates are significantly weaker than the surrounding tendons and ligaments and so are at increased risk of injury from any activity which loads the finger.

The majority of injuries are caused by micro traumas that build up over time as the result of persistent overloading of the PIP joint. However, a significant number of acute cases that appear to be the result of a single event have been reported. Research into these single acute events is currently limited and therefore the causes and full extent of them are not yet fully understood. It is suspected that these acute cases are also caused by microtraumas which are subclinical and therefore don't present any of the normal signs and symptoms.

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3. SIGNS & SYMPTOMS

Injured climbers normally complain of a gradual onset of pain in the joint and sometimes a reduced range of movement. A visible loss in the range of movement when compared to the other fingers can be a strong indicator of a problem. They may have PIP joint swelling and dorsal (back of finger) tenderness. Symptoms are often reproduced on the extremes of passive flexion and extension of the fingers. The fracture is normally on the dorsal aspect as the dorsal part of the epiphysis fuses last. Because these injuries are the result of a build-up of micro traumas it is impossible to predict when they might occur. Consider also that some injuries reported have presented no previous symptoms. If any symptoms are experienced, you should seek medical advice. Catching these injuries early is the best way to prevent problems further on.

4. TREATMENT

Pain = STOP! If a young climber exhibits any level of finger pain they SHOULD NEVER BE ALLOWED TO “work through the pain”. They should be assessed by a doctor to ascertain whether they have an acute injury (one that has just happened) or pain due to overuse. If finger epiphyseal injuries are left untreated, they can lead to disruption of bone growth, which may lead to permanent damage.

If young climbers experience the symptoms described above following training, they are likely to have an epiphyseal stress fracture and they MUST see their GP and insist on being referred to a hand surgeon urgently for experienced clinical review and further imaging. Even if nothing is seen on x-rays a focused MRI scan may confirm a stress fracture. We can't emphasize enough that this type of injury can cause long term problems and must be treated seriously.

It is normally recommended that you stop climbing for 6-8 weeks following an injury. It is important to seek reimaging after 8 weeks to confirm healing.

5. PREVENTION

The greatest stresses are caused by crimping holds, whether they be straight upward pulls, side pulls or “gastons”. Unfortunately, these techniques are core techniques to hard climbing and are therefore difficult to avoid. Where possible don't use full crimps, use half crimps or open grips. A good coach will help you to develop your finger strength in a safe way and will be able to teach you the nuances of crimp style holds. It is also best to avoid dynamic moves onto crimps. Good footwork is essential in reducing the strain on the fingers. If footholds are poor be especially aware of the feelings in your fingers. Self-awareness is vital in limiting growth plate injuries, Pain = Stop.

It is important if you are training hard that you seek advice from a Coach. Repetitive stress training such as on campus boards is a likely cause of these types of injuries. Be aware if you are going through a growth spurt as that is when you are most vulnerable.

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Full crimp



Half crimp

6. CONCLUSION

Climbing is a great sport but it is not risk free, many of the risks are self-evident but Primary Periphyseal Stress injuries are less obvious. Coaches and parents have a role to play in recognising the symptoms and when you are most vulnerable but you, as the climber, also must be aware of how your body is feeling.

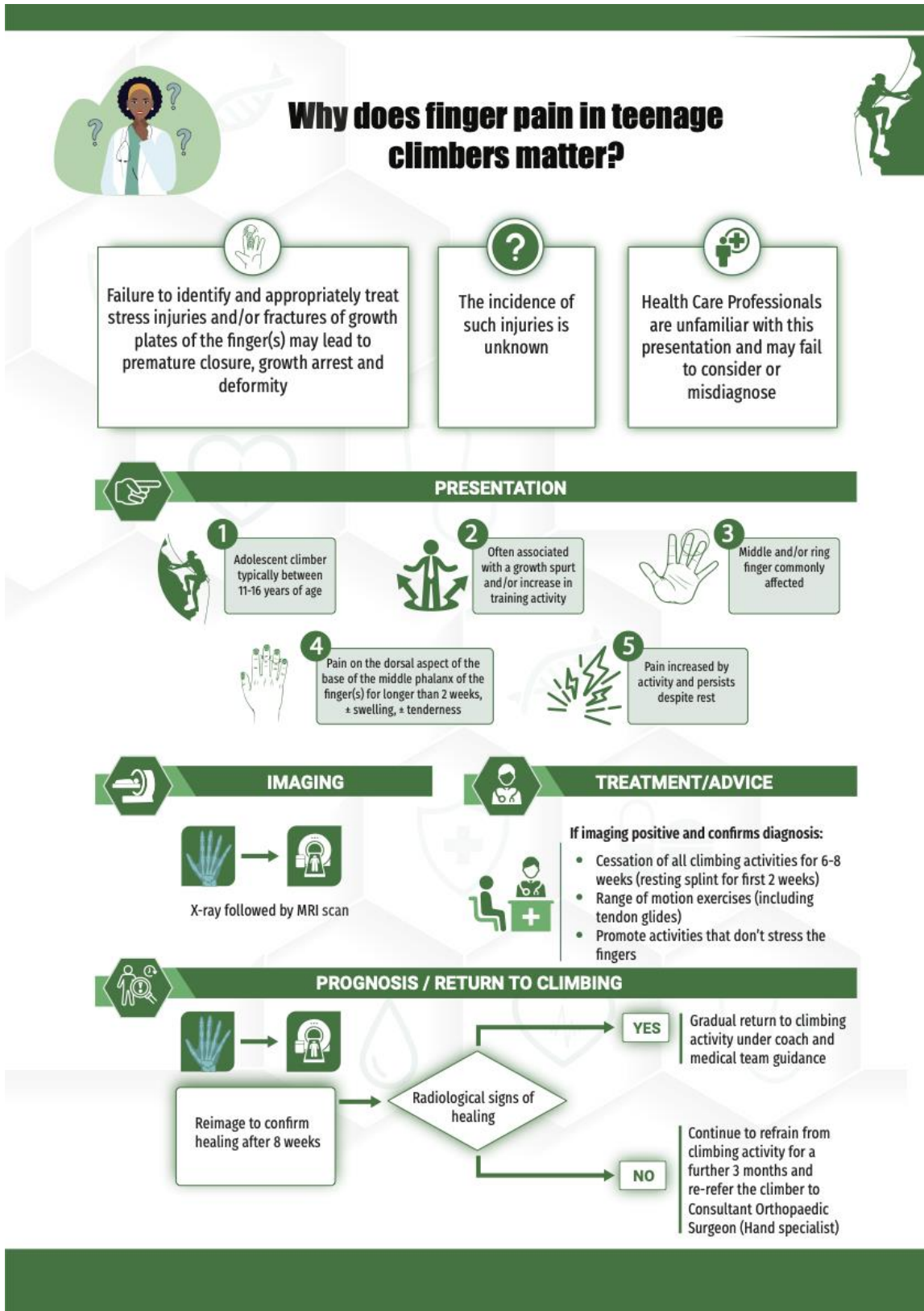
It's hard, your focus is on making the next move/sequence, everything else doesn't matter because you want to make the sequence, but you must try to listen to your body as well and remember.

PAIN = STOP.

¹ Photo credit: Kilian Reil (<http://www.lilianreil.com>)

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Further reading:

1. <https://eprints.leedsbeckett.ac.uk/id/eprint/9856/1/PrimaryPeriphysealStressInjuriesOfTheFingersInAdolescentClimbersACriticalReviewAM-JONES.pdf>
2. <https://pubmed.ncbi.nlm.nih.gov/34817275/#:~:text=Conclusion%3A%20The%20proposed%20management%20algorithm,these%20injuries%20in%20the%20future>
3. <https://blogs.bmj.com/bjism/2023/09/08/when-to-be-concerned-about-finger-pain-in-an-adolescent-climber/>
4. BMC website: Should U18s use campus boards?
5. "One move to many" (Sharp End publishing, Boulder, CO, USA)
6. Climbing Medicine" (Springer)