

# Injury Bulletins

## Adolescent Overuse Injuries



### Description

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A combination of increasing levels of exercise and “growth spurts”, lead to overuse injuries and are extremely common in the adolescent. Characterized by pain, swelling and discomfort during or following exercise, these injuries require careful management whilst a phase of increased growth (growth spurt) is occurring.

### Anatomy

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Adolescents are predisposed to different types of injuries because of various musculo-skeletal differences to a mature adult.



The presence of a growth plate is a key factor. The growth plate is a region towards the ends of bone where growth occurs. Immature bone cells divide to form more bone cells and mature to enlarge the bone both in diameter and length. Due to the immaturity of the growth plate, it is highly susceptible to injury. When participating in high level sports, overuse injuries involving this region occur in adolescents.

Ligament and tendon injuries are less common than growth plate injuries since they are stronger. In fact the joint capsule and ligament in an adolescent can be up to five times stronger than the growth plate.

During the adolescent growth spurt, bones grow faster than muscles and ligaments causing muscle-tendon tightness, a relative loss of flexibility and increase risk of overuse injuries.

### Types of Injury

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The most common three injuries include ***Osgood-Schlatter's Disease*** (knee), ***Sinding-Larsen-Johansson Disease*** (knee), and ***Sever's Disease*** (heel). Less common, but also affecting adolescents in high levels of exercise is ***mechanical low back pain*** which occurs in both running athletes/sports and swimmers.

## Osgood-Schlatters Disease

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Osgood-Schlatters Disease is one of the most common causes of knee pain in young athletes and occurs mostly in boys who are having a growth spurt whilst involved in high levels of sport or exercise. It causes swelling, pain and tenderness just below the knee, over the tibial tubercle (the point of bone where the quadriceps muscles attach to the tibia). There is a small growth plate present at the tibial tubercle and constant pulling of the quadriceps muscle on this region causes inflammation and in severe cases enlargement (a characteristic “bump”) or avulsion (pulling off the bone) of the growth plate. One or both knees can be affected simultaneously.

## Sinding-Larsen-Johansson Disease

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Sinding-Larsen-Johansson Disease occurs from a similar process to that of Osgood-Schlatters disease where the pull of the quadriceps tendon causes a traction injury to the growth plates on the patella (knee cap). It is located on the top or bottom edge of the patella and is again characterized by swelling, pain, inflammation and is often worse before and after exercise with less pain during competition. Although rare, the more severe cases can cause an avulsion (pulling off the bone) of the growth plates or more commonly a bony enlargement results.

## Sever's Disease

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Sever's Disease causes swelling, pain and tenderness usually at the back of the heel at the site of the Achilles tendon attachment to the calcaneus (heel). Similar to above, this is an overuse type problem associated with constant pulling of the calf muscles (rather than the quadriceps) on their attachment at the heel around the site of a growth plate. A bony lump, area of swelling, redness, pain and inflammation are again classic symptoms with a bony avulsion occurring in more severe cases.

## Mechanical Low Back Pain

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An alteration to normal lumbar spine curvature and abnormal loading leads to injury to the facet joints, muscles and ligaments of the low back. This causes muscle spasm and localized pain in the lower back, which can occasionally radiate into the buttocks. A combination of poor flexibility in the muscles attaching to the low back and pelvis (due to a growth spurt) and overuse of the low back during sporting activities, drives the condition. Biomechanical analysis of running patterns can assist in rectifying the problem.

## Treatment

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Immediate care for these conditions involves removing the athlete from the aggravating activity and employing the RICE routine: **Rest, Ice, Compression and Elevation**. Anti-inflammatory medication is sometimes prescribed but be sure to follow your doctors advice.

Since these conditions are generally caused by overuse, without an appropriate rest period (often at least 1-2 weeks) from the aggravating activity (usually any running or jumping) little improvement can be expected. Rest is vital in the early stages of treatment and may be necessary again when an accelerated period of growth (spurt) occurs once again.

Physiotherapy will allow the fastest and safest return to activity. Following assessment, your physiotherapist may incorporate some of the following treatment techniques:

- Specific stretching and flexibility program
- Biomechanical analysis and running correction
- Liaise with coaching staff or training modification
- Massage, joint mobilization
- Referral to sports medicine physician or podiatry as required

These conditions may flare intermittently until closure of the growth plates which varies between 16-19 years old for females and 18-21 years for males. They are often managed as a chronic condition with acute episodes of pain requiring immediate care and rest. Rest and seek appropriate physiotherapy treatment during episodes of pain in order to expedite recovery and return to sport sooner. Your physiotherapist will advise you when and how it is most appropriate to return to activity.

**Please feel free to discuss any problems or queries with your physiotherapist or get up to date treatment options by subscribing online at [www.rehabonthenet.com](http://www.rehabonthenet.com).**