Ligamentous Laxity

Peter Waller, DO
Family Medicine Resident at Advocate Lutheran General Hospital

Ligaments are bands of fibrous connective tissue in our body that connect one bone to another bone and provide support to our joints. In people with Down syndrome, these ligaments tend to be loose leading to increased flexibility of their joints. While this may be beneficial when attempting to touch your toes, the increased flexibility predisposes these joints to injury. In our bodies, joint stability and flexibility are inversely related, meaning the more flexible a joint is, the less stable it is. Two specific areas of concern for ligamentous laxity are the atlantoaxial joint because it can lead to atlantoaxial instability and the patellofemoral joint because it can lead to patellar subluxation, patellar dislocation, and patellofemoral syndrome.

The atlantoaxial joint is an articulation, or connection, between the first cervical vertebrae and the second cervical vertebrae in the neck. People with Down syndrome can have increased movement within this joint leading to atlantoaxial instability (AAI). While it is not completely known why this occurs, it is thought that ligament laxity may play a role in AAI in people with Down syndrome. AAI can be asymptomatic in some patients, while others may have significant symptoms depending on the degree of slippage present within the joint. If left untreated, severe complications including paralysis can occur from severe spinal cord compression. Currently, recommendations for screening patients for AAI are guided by symptoms. This makes identification of these signs and symptoms by the patient, family, and friends extremely important. Often, patients will need X-rays in flexion and extension to determine the degree of slippage of the AA joint. Examples of these X-rays can be seen in the picture below. Studies have found about 10% (or more) of people with Down syndrome have AAI and about 1% require surgery.
Please see your doctor if you have any symptoms that could indicate AAI.

- Weakness of arms or legs
- Clumsiness or tripping
- Walking with stiff legs
- Having a stiff neck, neck pain, and headaches
- Incontinence of stool or urine

The **patellofemoral joint** is the articulation of the patella (kneecap) and the femur (thigh bone). When the leg is bent and straightened, the knee cap normally glides within a groove located in the thighbone. This occurs frequently when walking, especially when walking up and down stairs. Because of ligament laxity and hypotonia (low muscular tone) often seen in people with Down syndrome, the knee cap can slide out of the normal groove. Several issues can occur when the knee cap slides out of the groove. If the muscles of the thigh are weak, chronic improper tracking of the knee cap can lead to knee pain, called patellofemoral syndrome. If the knee cap moves far to the side of the knee and is stuck out of position, this is termed a patellar dislocation. Patellar dislocations can be quite painful and need to be reduced, or put back into their proper place. At times this can be done by a caregiver, or the patient themselves, but certain situations will require a medical professional to reduce the dislocation. When the knee cap dislocates but goes back into place without manipulation, this is termed a patellar subluxation. Whether you are trying to prevent these injuries from happening or trying to recover from an injury described above, physical activity and strengthening the thigh muscles are of great importance.

Exercises to strengthen the knee can be found in the Families and Caregivers section of the Resources page on our website in the handout “Knee Pain from Patellofemoral Syndrome.”

**References:**
