

## Best Practice Recommendations

*A series of evidenced-based guidelines to improve your patient care, provided by the developers of ATGenius.com.*

## PATELLA DISLOCATION

Each Best Practice Recommendation includes key elements to evaluating or treating the condition, a Strength of Recommendation (SOR) grade based on research quality, and supporting evidence.

### Best Practice Recommendation #1: RISK FACTORS

**Adolescents and females are more likely to sustain a patella dislocation. Those with trochlear dysplasia, greater TT-TG distance, patella alta, and knee malalignment are at a greater risk for patella dislocation and recurrent instability. (SOR:C)**

- First-time dislocations are most common in adolescents age 10-15 and among females.<sup>1-3</sup>
- 10-50% of patients who dislocate and do not have surgical intervention will re-dislocate, especially if less than 18 years old, female, and those with developmental abnormalities.<sup>2,4</sup>
- Higher degree of patellar and trochlear dysplasia with an increased sulcus angle, lateralized tibial tuberosity, patella alta and increased patellar tilt are at greater risk for patellar instability.<sup>1-3</sup>
- Increased tibial tubercle – trochlear groove (TT-TG) distance >20mm is a risk factor for patellar dislocation.<sup>5</sup> Normal values depend on the degree of knee flexion: 16±4mm in extension to 9±4mm in flexion.<sup>1,3</sup>
- Genu valgum/recurvatum with an increased Q-angle, vastus medialis muscle hypoplasia, ligamentous laxity, and poorly healed MPFL from a previous injury increase the risk of patellar instability.<sup>1</sup>
- The combination of a sulcus angle  $\geq 154$  degrees, patella alta and skeletal immaturity results in an 80% predicted chance of re-dislocation. The probability is 23% with one factor present and 6% if no factors are present.<sup>6</sup>

### Best Practice Recommendation #2: STRUCTURES AFFECTED

**The medial patellofemoral ligament (MPFL), medial retinaculum, structure of the patellofemoral joint surfaces, and vastus medialis obliquus muscle are key components of patellar stability (SOR:C)**

- Within the patellofemoral joint, the two patellar joint medial and lateral surfaces are normally symmetric and congruent with the femoral trochlea.<sup>3</sup>
- The MPFL and medial retinaculum are ruptured with patellar dislocation in about 90% of patients.<sup>3,4,7</sup>
- The Vastus Medialis Obliquus (VMO) muscle contributes significantly to joint stability.<sup>3</sup>

- An osteochondral “flake fracture” is the most common intra-articular associated injury.<sup>1</sup>

### **Best Practice Recommendation #3: RECOGNITION**

**Patellar dislocations commonly present with the patella situated laterally with intense pain until the patella is reduced. Medial patella pain and an effusion occurs following reduction. (SOR:C)**

- Most dislocations occur to the lateral side with intense pain while the patella is dislocated and cessation of pain when patella is reduced.<sup>3,4</sup>
- A secondary effusion occurs following reduction along with pain on medial side of the patella.<sup>3,4</sup>
- Some patella dislocations self-reduce spontaneously. Only 20% of patients require reduction of persistent dislocation.<sup>3</sup>
- The patient describes a “sense of slippage” or “felt their knee slip out of place.”<sup>3</sup>

### **Best Practice Recommendation #4: EXAMINATION**

**The ‘J-sign,’ patella apprehension test and patella glide test are useful in determining the presence of patella instability. (SOR: B)**

- The ‘J-Sign’ on clinical examination is indicative of potential patellar instability. The patella follows an inverted J-pattern while the patient moves from knee extension to flexion.<sup>8</sup>
- The patella apprehension test is considered positive when pain and defensive muscle contraction occurs as the clinician glides the patella laterally with the knee in 20-30° flexion.<sup>9</sup>
  - Sensitivity 100%, Specificity 88.4%
- The patellar glide test evaluates instability by gliding the patella medially and laterally. A positive test is a medial or lateral displacement greater than or equal to 3 quadrants.<sup>9</sup>
  - Sensitivity 49%, Specificity 83%

### **Best Practice Recommendation #5: TREATMENT & REHABILITATION**

**Patella dislocation can be reduced with a simple maneuver involving knee extension with gentle medialized patella pressure. First time dislocations can be treated conservatively with 2-3 weeks of immobilization followed by rehabilitation, bracing and functional progression. Surgical management is recommended after a second dislocation, or due to fracture or chondral injury with a first -time dislocation. (SOR:B)**

- For dislocation reduction, the knee is brought into full extension and the patella is reduced by lateral medialized pressure to slip it back into the femoral trochlea.<sup>3</sup>
- Treatment options vary among first-time vs. recurrence patients.<sup>3,4</sup>
- Non-operative<sup>7</sup>
  - First-time dislocations with no chondral lesions, fractures or major damage to the medial stabilizing structures are usually treated conservatively with a period of immobilization in orthosis.<sup>3,4,10</sup>
  - Initial immobilization for 2-3 weeks is suggested to control pain and 20° flexion to approximate the two extremities of the torn medial wing.<sup>4</sup>

- The patient may be WBAT with early mobilization to maintain joint cartilage trophicity, including closed-chain exercises and passive mobilization.<sup>4</sup>
- Rehabilitation goals include restoring normal range of knee motion and reinforcing the quadriceps to restore dynamic patellar balance.<sup>4</sup>
- Rehabilitation exercises should include strengthening of the VMO, gluteal muscles and trunk stabilizers.<sup>11</sup>
- Return to sports criteria includes full passive ROM, no effusion, no patellar instability, and quadriceps muscle strength at least 80% of the non-injured limb. Patients treated conservatively should satisfy this criteria at about 6 weeks after dislocation.<sup>12</sup>
- Functional tests such as a shuttle run, figure of 8 pattern running, single leg hop test for distance, and triple leg hop test for distance should be incorporated in return to play decisions. A maximum 10% difference between legs for hop distance is part of the criteria for return to sport.<sup>11</sup>
- When returning to sports, patellar realignment bracing can medialize the patella relative to the femur and improves patellofemoral stability, particularly in weight bearing knee flexion angles between 0-30 degrees.<sup>13</sup>
- Operative treatment is recommended after a second dislocation<sup>7</sup>
  - MPFL reconstruction with or without tibial tubercle realignment.<sup>3,4</sup>
  - Chondral and osteochondral fracture may require surgical treatment.<sup>3</sup>
  - Surgery is followed by wearing a splint for 3 weeks.<sup>14</sup>
  - WB allowed in 3 weeks.<sup>14</sup>
  - RTS after 3 months of rehabilitation.<sup>14</sup>

Information researched and provided by Marissa Breymeier, MS, ATC. Treatment decisions should be made based on the best available evidence, patient preference, and clinician expertise, in consultation with, and at the direction of a physician.

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#### References

1. Hohne S, Gerlach K, Irlenbusch L, Schulz M, Kunze C, Finke R. Patella dislocation in children and adolescents. *Z Orthop Unfall*. 2017;155:169-176. <http://dx.doi.org/10.1055/s-0042-122855>.
2. Johnson DS, Turner PG. Management of the first-time lateral patellar dislocation. *The Knee*. 2019;26:1161-1165. <https://doi.org/10.1016/j.knee.2019.10.015>.
3. Duthon VB. Acute traumatic patellar dislocation. *Orthop Traumatol-Sur*. 2015;101:S59-S67. <http://dx.doi.org/10.1016/j.otsr.2014.12.001>.

4. Hilber F, Pfeifer C, Memmel C, et al. Early functional rehabilitation after patellar dislocation – What procedures are daily routine in orthopedic surgery? *Injury, Int J care Injured*. 2019;50:752-757. <https://doi.org/10.1016/j.injury.2018.10.020>.
5. Fithian DC, Paxton EW, Stone ML, Silva P, Davis DK, Elias DA, White LM. Epidemiology and natural history of acute patellar dislocation. *Am J Sports Med*. 2004; 32(5):1114-21.
6. Arendt EA, Askenberger M, Agel J, Tompkins MA. Risk of re-dislocation after primary patellar dislocation: A clinical prediction model based on magnetic resonance imaging variables. *Am J Sports Med*. 2018;46(14):3385-3390.
7. McGee TG, Cosgarea AJ, McLaughlin K, Tanaka M, Johnson K. Rehabilitation after medial patellofemoral ligament reconstruction. *Sports Med Arthrosc Rev*. 2017;25(2):105-113.
8. Hadidi O, Ellanti P, Lincoln M, et al. The J-Sign in patellar maltracking. *BMJ Case Rep*. 2018. doi:10.1136/bcr-2017-222887.
9. Sanchis-Alfonso, V. Anterior Knee Pain and Patellar Instability. London: Springer-Verlag London Ltd.; 2011.
10. Previtali D, Roumenov S, Pagliuzzi G, Filardo G, Zaffagnini S, Candrian C. Recurrent patellar dislocations without untreated predisposing factors: medial patellofemoral ligament reconstruction versus other medial soft-tissue surgical techniques – A meta-analysis. *J Arthrosc Relat Surg*. 2020;36(6): 1725-1734. <https://doi.org/10.1016/j.arthro.2019.12.029>.
11. Respizzi S, Cavalin R. First patellar dislocation: From conservative treatment to return to sport. *Joints*. 2014;2(3):141-145.
12. Menetry J, Putman S, Gard S. Return to sport after patellar dislocation or following surgery for patellar instability. *Knee Surg Sports Traumatol Arthrosc*. 2014;22:2320-2326.
13. Becher C, Schumacher T, Fleischer B, Ettinger M, Smith T, Ostermeier S. The effects of a dynamic patellar realignment brace on disease determinants for patellofemoral instability in the upright weight-bearing condition. *J Orthop Surg Res*. 2015;10(126):1-8.
14. Chouteau J. Surgical reconstruction of the medial patellofemoral ligament. *Orthop Traumatol-Sur*. 2016;101:S189-S194. <http://dx.doi.org/10.1016/j.otsr.2015.06.030>.