

### APPENDIX 3: Risk-of-Bias Assessments

#### Newcastle-Ottawa Quality Assessment Scale for Cohort and Case-Control Studies

Authors	Title	Type of Study	Selection (1 pt each)				Comparability (2 pts)	Outcome/Exposure (1 pt each)			TOTAL
			1	2	3	4	1	1	2	3	
Arai et al.	Comparative analysis of medial patellofemoral ligament length change pattern in patients with patellar dislocation using open-MRI.	Case control	1	0	0	1	0	1	1	1	5
Arendt et al.	An analysis of knee anatomic imaging factors associated with primary lateral patellar dislocations.	Cohort	1	1	1	1	0	0	1	1	6
Balcarek et al.	Vastus medialis obliquus muscle morphology in primary and recurrent lateral patellar instability	Case control	1	1	0	1	1	0	1	1	6
Balcarek et al.	Geometry of Torsional Malalignment Syndrome: Trochlear Dysplasia but Not Torsion Predicts Lateral Patellar Instability.	Case control	1	1	0	0	1	0	1	1	5
Balcarek et al.	Influence of tibial slope asymmetry on femoral rotation in patients with lateral patellar instability.	Case control	1	1	1	1	2	0	1	1	8
Barnett et al.	Patellar height measurement in trochlear dysplasia.	Case control	1	1	0	0	0	1	0	0	3
Biedert et al.	The lateral condyle index: A new index for assessing the length of the lateral articular trochlea as predisposing factor for patellar instability	Case control	1	1	1	1	0	1	1	1	7
Biedert et al.	Anterior-posterior trochlear measurements of normal and dysplastic trochlea by axial magnetic resonance imaging.	Case control	1	1	1	1	0	0	1	1	6
Brady et al.	The Tibial Tubercle-to-Trochlear Groove Distance Is Reliable in the Setting of Trochlear Dysplasia, and Superior to the Tibial Tubercle-to-Posterior Cruciate Ligament Distance When Evaluating Coronal Malalignment in Patellofemoral Instability.	Case control	1	1	1	1	2	1	1	1	9
Burke et al.	Clinical Utility of Continuous Radial Magnetic Resonance Imaging Acquisition at 3 T in Real-time Patellofemoral Kinematic Assessment: A Feasibility Study	Case control	1	1	1	1	1	0	1	1	7
Campos et al.	The trochlear isometric point is different in patients with recurrent patellar instability compared to controls: a radiographical study.	Case control	1	1	1	1	2	0	1	1	8
Cao et al.	Ratio of the tibial tuberosity-trochlear groove distance to the tibial maximal mediolateral axis: A more reliable and standardized way to measure the tibial tuberosity-trochlear groove distance	Case control	1	1	1	1	2	0	1	1	8
Caplan et al.	Is tibial tuberosity-trochlear groove distance an appropriate measure for the identification of knees with patellar instability?	Case control	1	1	1	1	2	1	1	1	9
Charles et al.	Magnetic resonance imaging-based topographical differences between control and recurrent patellofemoral instability patients	Case control	1	1	1	1	0	0	1	1	6
Chassaing et al.	Tibial tubercle torsion, a new factor of patellar instability.	Case control	1	1	1	1	0	0	1	1	6
Clark et al.	Mapping the contact area of the patellofemoral joint: the relationship between stability and joint congruence.	Case control	1	1	0	1	2	0	1	1	7
Cooney et al.	The relationship between quadriceps angle and tibial tuberosity-trochlear groove distance in patients with patellar instability	Case control	1	1	1	1	2	0	1	1	8
Daynes et al.	Tibial Tuberosity-Posterior Cruciate Ligament Distance.	Case control	0	1	1	0	0	0	1	1	4
de Oliveira et al.	Medial patellofemoral ligament anatomy: is it a predisposing factor for lateral patellar dislocation?	Case control	1	1	1	1	0	0	1	1	6
Dejour et al.	The introduction of a new MRI index to evaluate sagittal patellofemoral engagement.	Case control	1	1	1	1	2	0	1	1	8
Demehri et al.	Imaging characteristics of contralateral asymptomatic patellofemoral joints in patients with unilateral instability.	Case control	1	1	1	1	2	1	0	1	8
Deveci et al.	Are metric parameters sufficient alone in evaluation of the patellar instability? New angular measuring parameters: The trochlear groove-patellar tendon angle and the trochlear groove-dome angle	Case control	1	0	1	1	2	0	1	1	7
Diederichs et al.	Magnetic resonance imaging analysis of rotational alignment in patients with patellar dislocations.	Case control	1	1	1	1	2	0	1	1	8
Dong et al.	Evaluation of trochlear dysplasia severity using trochlear angle: A retrospective study based on computed tomography (CT) scans	Case control	1	1	1	1	2	1	1	1	9
Domacher et al.	Measurement of tibial tuberosity-trochlear groove distance: evaluation of inter- and intraobserver correlation dependent on the severity of trochlear dysplasia.	Case control	0	1	0	1	0	1	1	1	5
Gillespie et al.	Influence of posterior lateral femoral condyle geometry on patellar dislocation.	Case-Control	1	1	1	1	1	1	1	1	8
Guilbert et al.	Axial MRI index of patellar engagement: A new method to assess patellar instability	Case-Control	1	1	1	1	0	1	1	1	7
Heidenreich et al.	The contribution of the tibial tubercle to patellar instability: analysis of tibial tubercle-trochlear groove (TT-TG) and tibial tubercle-posterior cruciate ligament (TT-PCL) distances	Cohort	1	0	0	1	0	1	1	1	5

Heidenreich et al.	Individualizing the tibial tubercle to trochlear groove distance to patient specific anatomy improves sensitivity for recurrent instability.	Cohort	1	1	1	1	0	1	1	1	7
Hinckel et al.	Patellar Tendon-Trochlear Groove Angle Measurement: A New Method for Patellofemoral Rotational Analyses.	Cohort	1	1	1	1	0	1	1	1	7
Hinckel et al.	Are the osseous and tendinous-cartilaginous tibial tuberosity-trochlear groove distances the same on CT and MRI?	Case-Control	0	1	1	1	0	0	1	1	5
Hingelbaum et al.	The TT-TG Index: a new knee size adjusted measure method to determine the TT-TG distance.	Case-Control	0	0	1	1	0	1	1	1	5
Köhlitz et al.	Prevalence and patterns of anatomical risk factors in patients after patellar dislocation: a case control study using MRI.	Case-Control	1	0	1	1	2	1	1	1	8
Kuroda et al.	A new quantitative radiographic measurement of patella for patellar instability using the lateral plain radiograph: 'patellar width ratio'	Case-Control	1	1	1	1	2	1	1	1	9
Li et al.	Quantitative magnetic resonance imaging in patellar tendon-lateral femoral condyle friction syndrome: relationship with subtle patellofemoral instability.	Case-Control	1	1	1	1	0	1	1	1	7
Lim et al.	Comparative study of magnetic resonance imaging (MRI) parameters in a Southeast Asian population with symptomatic patellofemoral instability.	Case-Control	1	1	1	1	1	1	1	1	8
Ma et al.	Medial retinaculum plasty versus medial patellofemoral ligament reconstruction for recurrent patellar instability in adults: a randomized controlled trial	Cohort	1	1	1	1	2	1	1	1	9
Mohammadinejad	Value of CT scan-assessed tibial tuberosity-trochlear groove distance in identification of patellar instability	Case-Control	1	1	1	1	2	1	1	1	9
Munch et al.	Patellar Articular Overlap on MRI Is a Simple Alternative to Conventional Measurements of Patellar Height.	Cohort	1	1	1	1	1	1	1	1	8
Noehren et al.	Radiographic parameters associated with lateral patella degeneration in young patients	Cohort	1	1	1	1	2	1	1	1	9
Pozzi et al.	Middle patellar tendon to posterior cruciate ligament (PT-PCL) and normalized PT-PCL: New magnetic resonance indices for tibial tubercle position in patients with patellar instability.	Case-Control	1	1	1	1	0	1	1	1	7
Roessler et al.	Medial patellofemoral ligament reconstruction fails to correct mild patella alta in cases of patellofemoral instability—a case-control study	Case-Control	1	1	1	1	2	1	1	1	9
Roger et al.	Short lateral posterior condyle is associated with trochlea dysplasia and patellar dislocation.	Case-Control	1	1	1	1	1	1	1	1	8
Schueda et al.	Use of computed tomography to determine the risk of patellar dislocation in 921 patients with patellar instability.	Case-Control	1	1	1	1	1	0	0	1	6
Seitlinger et al.	The position of the tibia tubercle in 0°–90° flexion: comparing patients with patella dislocation to healthy volunteers	Case-Control	1	1	1	1	2	1	1	1	9
Seitlinger et al.	Tibial tubercle-posterior cruciate ligament distance: a new measurement to define the position of the tibial tubercle in patients with patellar dislocation.	Cohort	1	1	1	1	2	1	1	1	9
Skelley et al.	Inter- and intraobserver reliability in the MRI measurement of the tibial tubercle-trochlear groove distance and trochlea dysplasia.	Cohort	1	1	1	1	1	1	1	1	8
Takagi et al.	Alignment in the transverse plane, but not sagittal or coronal plane, affects the risk of recurrent patella dislocation.	Cohort	1	1	1	1	1	1	1	1	8
Tensho et al.	What components comprise the measurement of the tibial tuberosity-trochlear groove distance in a patellar dislocation population?	Case-Control	1	1	1	1	2	1	1	1	9
Tensho et al.	Lateralization of the Tibial Tubercle in Recurrent Patellar Dislocation	Case-Control	1	1	1	1	2	1	1	1	9
Tscholl et al.	Conventional Radiographs and Magnetic Resonance Imaging for the Analysis of Trochlear Dysplasia: The Influence of Selected Levels on Magnetic Resonance Imaging.	Cohort	1	0	1	0	0	1	1	1	5
Tsuda et al.	Incidence and radiologic predictor of postoperative patellar instability after Fulkerson procedure of the tibial tuberosity for recurrent patellar dislocation.	Case-Control	1	1	1	1	0	1	0	0	5
Urch et al.	Axial linear patellar displacement: a new measurement of patellofemoral congruence.	Cohort	1	1	1	1	0	1	1	1	7
Voss et al.	Quantification Of Trochlea Dysplasia Via Computed Tomography: Assessment Of Morphology Difference Between Control And Chronic Patellofemoral Instability Patients	Case-Control	1	1	1	1	0	1	1	1	7
Xue et al.	Excessive lateral patellar translation on axial computed tomography indicates positive patellar J sign.	Case-Control	1	1	1	1	2	1	1	1	9

Yamada et al.	Correlation of 3D Shift and 3D Tilt of the Patella in Patients With Recurrent Dislocation of the Patella and Healthy Volunteers: An In Vivo Analysis Based on 3-Dimensional Computer Models.	Case-Control	1	0	0	1	1	1	0	1	5
Yi et al.	Femoral Trochlear Groove Morphometry Assessed on Oblique Coronal MR Images.	Case-Control	1	1	1	1	2	1	1	1	9
Yue et al.	Patellar Height Measurements on Radiograph and Magnetic Resonance Imaging in Patellar Instability and Control Patients.	Cohort	1	1	1	0	0	1	1	1	6
Zheng et al.	Surgical medial patellofemoral ligament reconstruction versus non-surgical treatment of acute primary patellar dislocation: a prospective controlled trial	Cohort	1	1	1	1	2	1	1	1	9
Crebs et al.	Effectiveness of Fulkerson Osteotomy with Femoral Nerve Stimulation for Patients with Severe Femoral Trochlear Dysplasia	Cohort	1	0	1	1	0	1	1	1	6

7.16667

## Cochrane Risk-of-Bias Assessment for Randomized Controlled Trials

Author	Title	Domain 1				Domain 2							Domain 3					Domain 4					Domain 5				overall risk of bias		
		1.1	1.2	1	total	2.1	2.2	2.3	2.4	2.5	2.6	2.7	total	3.1	3.2	3.3	3.4	total	4.1	4.2	4	4.4	4.5	total	5.1	5.2		5.3	total
Kang et al.	Comparison of 2 different techniques for anatomic reconstruction of the medial patellofemoral ligament: a prospective randomized study	Y	PY	N	low risk	PY	Y	N	NA	NA	Y	NA	low risk	Y	NA	NA	NA	low risk	N	N	PY	PY	PN	some concerns	Y	N	N	low risk	some concerns
Liu et al.	Lateral retinaculum plasty instead of lateral retinacular release with concomitant medial patellofemoral ligament reconstruction can achieve better results for patellar dislocation	Y	NI	N	low risk	PY	Y	N	NA	NA	Y	NA	low risk	Y	NA	NA	NA	low risk	N	PN	PY	PY	PN	some concerns	Y	N	N	low risk	some concerns
Du et al.	Evaluation of different surgical methods in treating recurrent patella dislocation after three-dimensional reconstruction	NI	NI	PN	some concerns	PY	Y	N	NA	NA	Y	NA	low risk	Y	NA	NA	NA	low risk	N	PN	PY	PY	PN	some concerns	Y	N	N	low risk	some concerns

## Joanna Briggs Critical Appraisal Tool for Case-Series

Authors	Title	Type of Study	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8	Item 9	Item 10	Assessment
Falkowski et al.	Increased Magnetic Resonance Imaging Signal of the Lateral Patellar Facet Cartilage: A Functional Marker for Patellar Instability?	Case Series	Yes	Unclear	Yes	Unclear	Yes	Yes	Yes	Yes	No	Yes	Low Risk
Feric et al.	Patella Height Correlates With Trochlear Dysplasia: A Computed Tomography Image Analysis	Case Series	Yes	Unclear	Yes	Unclear	Yes	Yes	No	Yes	No	Yes	Low Risk
Francoizi et al.	Increased Femoral Anteversion Influence Over Surgically Treated Recurrent Patellar Instability Patients	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Low Risk
Graf et al.	Q-vector measurements: physical examination versus magnetic resonance imaging measurements and their relationship with tibial tubercle-trochlear groove distance.	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Low Risk
Hevesi et al.	The Recurrent Instability of the Patella Score: A Statistically Based Model for Prediction of Long-Term Recurrence Risk After First-Time Dislocation	Case Series	Yes	Yes	Unclear	Unclear	Unclear	Yes	No	Yes	No	Yes	Low Risk
Higuchi et al.	An analysis of the medial patellofemoral ligament length change pattern using open-MRI.	Case Series	No	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Low Risk
Hinckel et al.	Why are bone and soft tissue measurements of the TT-TG distance on MRI different in patients with patellar instability?	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Low Risk
Kulkarni et al.	Patellar instability in Indian population: relevance of tibial tuberosity and trochlear groove distance.	Case Series	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Low Risk
Liu et al.	Clinical Outcomes After Isolated Medial Patellofemoral Ligament Reconstruction for Patellar Instability Among Patients With Trochlear Dysplasia	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Low Risk
McDermott et al.	A clinical and radiographic approach for establishing proper tibial tubercle transfer when using quad active femoral nerve stimulation.	Case Series	Yes	Yes	Yes	No	No	Yes	No	Yes	No	N/A	Low Risk
Neri et al.	Clinical and Radiological Predictors of Functional Outcome After Isolated Medial Patellofemoral Ligament Reconstruction at Midterm Follow-up.	Case Series	Yes	Yes	Yes	Yes	No	Yes	No	Yes	No	Yes	Low Risk
Netto et al.	Study on the Patellofemoral Joint Using Magnetic Resonance Imaging: Morphological Variations of the Medial Patellofemoral Ligament	Case Series	No	Yes	Unclear	No	No	Yes	No	Yes	Yes	Yes	Low Risk
Nha et al.	Surgical Treatment With Closing-Wedge Distal Femoral Osteotomy for Recurrent Patellar Dislocation With Genu Valgum	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes	Low Risk
Nimoto et al.	Quantitative stress radiography of the patella and evaluation of patellar laxity before and after lateral release for recurrent dislocation patella	Case Series	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Low Risk
Ortug et al.	Evaluation of normal tibial tubercle to trochlear groove distance in adult Turkish population.	Case Series	Yes	Yes	Yes	Unclear	Unclear	Yes	No	Yes	Yes	Yes	Low Risk
Salzmann et al.	Comparison of native axial radiographs with axial MR imaging for determination of the trochlear morphology in patients with trochlear dysplasia.	Case Series	no	Yes	Yes	no	no	Yes	no	Yes	no	Yes	Low Risk
Shimizu et al.	Middle-to long-term outcome after medial patellofemoral ligament reconstruction with Insall's proximal realignment for patellar instability	Case Series	Yes	Unclear	Yes	Unclear	Unclear	Yes	no	yes	no	Yes	Low Risk
Smith et al.	The intra- and inter-rater reliability of X-ray radiological measurements for patellar instability.	Case Series	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	no	no	Yes	Low Risk
Swarup et al.	Patellar instability treated with distal femoral osteotomy	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no	Yes	Low Risk
Tanaka et al.	Correlation between Changes in Tibial Tuberosity-Trochlear Groove Distance and Patellar Position during Active Knee Extension on Dynamic Kinematic Computed Tomographic Imaging	Case Series	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no	no	Yes	Low Risk
Wind et al.	A combined procedure with Bereiter-type trochleoplasty leads to a stable patellofemoral joint at 5-year follow-up	Case Series	Yes	Yes	Yes	Yes	Yes	no	no	yes	no	Yes	Low Risk
Woodmass et al.	Medial patellofemoral ligament reconstruction reduces radiographic measures of patella alta in adults	Case Series	Yes	unclear	unclear	Yes	Yes	yes	no	no	no	yes	Low Risk
Yang et al.	Reconstruction of the medial patellofemoral ligament and reinforcement of the medial patellofemoral ligament is an effective treatment for patellofemoral instability with patella alta	Case series	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Low Risk
Beckert et al.	Clinical Accuracy of J-Sign Measurement Compared to Magnetic Resonance Imaging.	Case series	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no	no	Yes	Low Risk
Byani et al.	Anatomical factors influencing patellar tracking in the unstable patellofemoral joint	Case series	unclear	no	no	no	no	unclear	no	no	no	Yes	High Risk
Bonadio et al.	Plateau-patella angle: An option for the evaluation of patellar height in patients with patellar instability.	Case series	Yes	no	no	Yes	Yes	unclear	no	no	no	Yes	High Risk
Camp et al.	Individualizing the Tibial Tubercle-Trochlear Groove Distance: Patellar Instability Ratios That Predict Recurrent Instability	case series	Yes	Yes	Yes	No	No	Yes	No	Yes	No	Yes	Low Risk
Chen et al.	Arthroscopic lateral retinacular release, medial retinacular plication and partial medial tibial tubercle transfer for recurrent patellar dislocation	case series	yes	yes	yes	yes	yes	yes	yes	yes	no	yes	Low Risk
Dickschas et al.	Correlation of the tibial tuberosity-trochlear groove distance with the Q-angle.	case series	Yes	Yes	Yes	Yes	Yes	Yes	yes	no	no	Yes	Low Risk
Dragoo et al.	Medial patellofemoral ligament repair versus reconstruction for recurrent patellar instability: Two-year results of an algorithm-based approach	case series	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	no	Yes	Low Risk
Edwards et al.	TT-TG vs. modified lateral patellar edge for determination of tibial tubercle transfer distance in Fulkerson osteotomy procedures.	case series	Yes	Yes	Yes	Yes	Yes	Yes	Yes	unclear	no	no	Low Risk
Neitz et al.	Evaluation of trochlear dysplasia using MRI: correlation between the classification system of Dejour and objective parameters of trochlear dysplasia.	case series	Yes	Yes	Yes	Yes	No	No	No	Yes	no	no	Low Risk
Marzo et al.	Comparison of a Novel Weightbearing Cone Beam Computed Tomography Scanner Versus a Conventional Computed Tomography Scanner for Measuring Patellar Instability	Case series	Yes	Yes	Yes	Unclear	No	Yes	No	Yes	no	Yes	Low Risk