Surgeon and physiotherapist approaches to surgical referrals for people with recurrent patellar dislocation: a UK survey

Running Title: MANAGEMENT OF PATELLAR DISLOCATIONS

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Acknowledgements

The authors would like to thank all clinicians and statisticians for helping to formulate, disseminate and analyse this survey. We would also like to extend our gratitude to the British Patellofemoral Society, the iCSP network, and all who shared the survey on social media.

Funding

This project forms part of a master's in clinical research through Newcastle University; for which the first author received funding from Clinical Research Network (CRN) Northeast North Cumbria (NENC) and Health Education North (HEE). This funding covered the course tuition and part time paid study leave. No other funding was received.

Declaration of Competing Interest

The authors declare there are no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Abstract

Background: Physiotherapists are often key decision-makers on when to refer patients with recurrent patellar dislocation for surgical opinion. Limited guidance exists to aid this decision. Differences in orthopaedic surgeons' and physiotherapists' views on which patients and when to refer people for surgical consideration or non-operative care may affect outcome. This study aimed to explore orthopaedic surgeons and physiotherapists decision-making surrounding treatment opinions for patients with recurrent patellar dislocation.

Methods: An online survey performed. UK registered and practicing orthopaedic surgeons and physiotherapists were invited to participate. The survey utilised two vignettes and a series of related questions to ascertain respondents' views on decision-making to surgical referral for people with recurrent patellar dislocation. Data were analysed using descriptive statistics and inferential statistical tests to explore factors related to responses.

Results: 84 respondent surveys were analysed (38 surgeons, 46 physiotherapists). Overall, there was a low level of agreement amongst respondents for the management of the vignettes ($k = 0.215$, $p =< 0.0005$). Some disparity existed between the professions on the definition of recurrent patellar dislocations and the clinical features which may require an early surgical assessment. Physiotherapists were three times more likely to delay a surgical opinion for the vignettes presented in this study than the surgeons.

Conclusion: This is the first study to investigate orthopaedic surgeons' and physiotherapists' views on decision-making around surgical or non-operative management for recurrent patellar dislocations. High-quality research is required to underpin explicit guidance on decision-making regarding management of recurrent patellar dislocation.

Keywords: Knee, recurrent patellar dislocation, patellofemoral instability, surgery, physiotherapy, agreement

1. Introduction

The incidence of primary patellar dislocation has been reported as between 5-7 per 100,000 people per year with between 15 and 80% of people experiencing recurrent dislocations (Fithinan et al 2004, Thompson & Metcalf 2019). The factors thought to contribute to recurrent dislocation are complex and multifactorial. This often requires a multidisciplinary approach to management.

Treatment for recurrent patellar dislocation is either operative or non-operative. Physiotherapy is the cornerstone of non-operative management. At present, there is a lack of high-quality research on-which to base management decisions. There is little evidence to guide the decision-making on surgical consideration. Special interest groups have produced guidelines based on expert opinion (Liu et al 2018, Bailey et al 202). The International Patellofemoral Study Group (IPSG) (Liu et al 2018) suggested recurrent patellar dislocations should be managed surgically whilst The British Association for Surgery of the Knee (BASK) (Bailey et al 2021), advocated non-operative measures including physiotherapy should be considered as first-line, but did not offer guidance on when surgery may be preferable to physiotherapy.

Many clinicians follow the principle that operative interventions are considered once non-surgical interventions i.e., physiotherapy, have been exhausted (Moiz et al 2018). Physiotherapists often become key decision-makers regarding when to refer these patients for a surgical opinion. Disparity of opinion between surgeons and physiotherapists on the timing of surgical assessment can have negative impacts for both patient and healthcare provider. It is currently unknown whether there is agreement between the two professions on whom to refer for surgical consideration and when.

The purpose of this study is to explore the management and opinions of UK physiotherapists and orthopaedic surgeons in relation to recurrent patellar dislocations, with a particular focus on decision-making surrounding surgical referral.

2. Materials and Methods

2.1 Design

This was a cross-sectional observational study using an online survey. It has been reported in accordance with the STROBE Statement (Vandenbroucke et al 2007).

The online survey is presented as **Supplementary File 1, Table 1** shows the vignettes presented. It was designed by the research team (LI, DD, TS). Questions and potential responses were derived from literature pertaining to the management of patellar dislocations (Thompson &Metcalf 2019, Liu et al

2018, Boast 2020, Bailey et al 2021. Moiz et al 2018, Elmajee et al 2020, Weber et al 2016, Smith et al 2011, Matsushita et al 2017, Smith et al 2011, Smith et al 2010, Smith et al 2015).

The survey was piloted with two knee surgeons within South Tyneside and Sunderland NHS (National Health Service) Trust, three physiotherapists from neighbouring NHS Trusts within the North East of England with a known special interest in patellar dislocations and one physiotherapist from East Anglia with research experience on the topic of patellar dislocations. This showed the survey took an average of 10 minutes to complete and pilot respondents were satisfied that there were no confusing or leading questions.

Ethical approval was granted prior to commencing the study from the Newcastle University Research Ethics Committee (REF:8403/2020).

The survey consisted of 19 questions including two vignettes. Questions posed gathered data on: demographic characteristics (profession, experience, area of work, location, special interest); methods of clinical assessment (special tests, outcome measures, definition of recurrent dislocations, definition of 'failed physiotherapy'); and determinants of decision making regarding surgical referral. Special tests and outcome measures were either well known in clinical practice or taken from the current literature on recurrent patellar instability. Responses were recorded using Likert scales or multiple-choice questions.

2.2 Participants and Dissemination

The survey was open to any UK registered and practising orthopaedic surgeon or physiotherapist. Potential respondents were currently practicing and reported treating people with recurrent patellar dislocation in their caseload. Prior to answering any questions, on the online survey opening page, potential respondents were provided with information regarding the study followed by a consent page. As part of the consent stage, participants declared they met the above inclusion criteria and consented to participate.

The survey was hosted on Surveymonkey.com. The hyperlink to the survey was shared on social media (Twitter and Facebook) and by email to members of the British Patellofemoral Society and the Musculoskeletal (Msk) network within the interactive CSP (Chartered Society of Physiotherapy) website, a platform for sharing information within the UK physiotherapy profession.

No power calculation was performed. Previous surveys of musculoskeletal practice evaluation reported sample size of 100 participants to be adequate in answering research questions pertaining to current practice. Neither of these studies provided power calculations (Bury & Littlewood 2018, Bateman et al 2019, Smith et al 2017, Carter et al 2021). This was therefore the target sample size. The survey was therefore to close once this target had been reached. The survey was open between 28th March 2021 – 21st June 2021.

2.3 Data analysis

Primary objective of the project was to compare the decision-making between the two professions using two vignettes. Respondents were asked to choose one of six management plans for each vignette. Descriptive statistics (frequencies and percentages) were calculated for each management plan and compared between the two professions. A chi-square test was applied by dichotomizing the management plans into early or delayed surgical opinion groups to test for an association between profession and management. To gain a better understanding of the decision-making process and to ascertain whether any specific assessment findings altered the management, the clinical findings of each vignette was altered, and respondents were asked to state their management decision for each change. For example, for Vignette A, respondents were asked to formulate a treatment plan where there was no osteochondral defect and a plan for when an osteochondral defect was present, but all other clinical features remained the same. Agreement amongst all respondents and within the two professions for the differing clinical scenarios were analysed for agreement using Fleiss Kappa (Lared 2019).

Secondary objectives were to determine whether a level of agreement exists on when physiotherapy has been exhausted using the umbrella term 'failed physiotherapy'; the degree of agreement on the definition of recurrent patellar dislocations and the assessment tools used by the two professions.

The term 'failed physiotherapy' is a term often used clinically to describe patients who are considered to have exhausted all non-surgical options and have not achieved their treatment goals I.e., remain symptomatic of instability and are seeking further treatment options.

Respondents were asked to rate their agreement with eight definitions of 'failed physiotherapy' on a five-point Likert scale from 'strongly agree' to 'strongly disagree'. These were classified into three groups (strongly agree/agree, neither agree nor disagree, strongly disagree/disagree). The frequencies and percentages of each group were calculated for both professions and compared. A chi Squared calculation was used to test for an association between professions strongly agreeing/agreeing and strongly disagreeing/disagreeing (Lared 2019).

To assess the degree of agreement on the definition of recurrent patellar dislocations, we presented six definitions of recurrent dislocations. Respondents were asked to choose which definition they felt was the minimum requirement for a patient to be diagnosed with recurrent patellar dislocations. The frequencies and percentages of each profession choosing each statement were calculated and compared.

We presented a list of objective assessment tools and asked respondents to state how often they used each one when assessing patients following a patellar dislocation. Scores were on a five–point Likert scale from always – never. These were grouped into three categories (always/often, sometimes/rarely, and never). Frequencies and percentages were calculated for each category for both professions and compared.

Respondents were given a list of 10 Patient Reported Outcome Measures (PROMS) and asked to rate how often they used these in their clinical practice for patients with recurrent patellar instability. This was scored on a five-point Likert scale (1=-always, 2=-often, 3=-sometimes, 4=-rarely, 5=-never). The Likert scale was grouped into three categories: always/often, sometimes/rarely, and never. Frequencies and percentages for each category were compared for both professions.

Analyses were performed using IBM SPSS Statistics version 27 (SPSS, IBM Corp, New York, USA).

3. Results

3.1 Survey Response

In total, 109 responses were collected (108 consented, one respondent did not consent). In total, 73 professionals fully-completed the survey. Eleven partially completed at least one clinical question. Twenty-two provided demographic characteristics only and two were ineligible, 84 (38 surgeons, 46 physiotherapists) were included in the analysis providing responses to at least one vignette.

3.2. Respondent Characteristics

Table 2 and **Table 3** present the demographic characteristics of respondents. Seventy-three respondents (87%) worked in the NHS as their primary job. Two physiotherapists described themselves as 'other' (one clinical lead trauma, one allied health professional clinical academic lead). Several participants described additional areas of work as 'other'. These included: education (n=3), voluntary work (n=1), medicolegal (n=1).

3.3 Case Studies

Respondents were asked to choose a treatment plan for two vignettes (**see Table 1). Table 4** shows the summary of the respondent's views on surgical decision-making for both vignettes.

For Vignette A, the surgeon respondents were divided between early physiotherapy and early surgical opinion (37%), early physiotherapy and surgical opinion depending on physiotherapy outcome (24%) and to investigate further (32%). Over half of the physiotherapists opted to consider a surgical opinion depending upon the outcome of a course of physiotherapy (61%) with the second highest proportion recommending early physiotherapy and early surgical opinion (17%).

For Vignette B, over half of the surgeon respondents (56%) opted for an early surgical opinion, compared to approximately a third of physiotherapists choosing this option (36%). For both vignettes a greater proportion of physiotherapists opted for physiotherapy only than the surgeon respondents (**Table 4**).

There was a statistically significant association between profession and preference for delaying a surgical opinion for both vignettes ($X^2(1) = 7.555$, $p=0.006$, $X^2(1) = 3.873$, $p= 0.049$ respectively). There was a greater probably for a delayed surgical decision from a physiotherapist compared to surgeon for both Vignette A (Odd Ratio (OR): 4.33) and Vignette B (OR: 3.07).

Low agreement was found between all respondents *k = 0.215 (95% CI 0.21 - 0.22) p=< 0.0005* and within each profession; surgeons *k=0.226 (95% CI 0.20 - 0.25) p=<0.0005;* physiotherapists *k=0.200 (95% CI 0.18 - 0.21) p=0.0005*.

The presence of an osteochondral injury for Vignette A highlighted a clinically relevant disparity in the decision making of the two professions. Seventy-one percent (n=27/38) of surgeons and only 26% (12/46) of physiotherapists felt an early surgical opinion should be sought before starting physiotherapy when an osteochondral injury was noted on x-ray. Twenty-nine percent of surgeons (n=11/38) and 54.3% (25/46) physiotherapists chose to start physiotherapy and have an early surgical opinion. No surgeons chose to delay a surgical opinion whereas 20% (9/46) of the physiotherapist respondents opted to start physiotherapy and consider a surgical opinion depending on the outcome.

Anxiety about surgery was a key finding which influenced the decision-making of the surgeon respondents. For Vignette B, the presence of anxiety about surgery caused the number of surgical respondents to delay a surgical opinion depending on the outcome of physiotherapy by over 40% (from 23.6% to 65.8%).

There was little consistency from the surgeons when degenerative changes were present in both vignettes. For Vignette A, 66% (25/38) of surgeons opted to start physiotherapy and consider a surgical opinion depending on the outcome whereas for Vignette B, only 39% (n= 14/38) of surgeons chose to delay a surgical opinion depending on the outcome of physiotherapy.

3.4 Definition of 'Failed Physiotherapy'

The results of the definition of when an individual had 'failed physiotherapy' is presented in **Table 5**. As this illustrates, the highest percentage of respondents agreed or strongly agreed with Statement 4 (91% of surgeons/ 83% of physiotherapists). The highest percentage of respondents disagreed or strongly disagreed with Statement 7 (91% surgeons /76% physiotherapists*).* Statements 5 and 8 showed statistically significant associations between profession and agreement with surgeons more likely to agree with both statements (Statement 5, 79% surgeons/51% Physiotherapists *p*=0.003 and Statement 8, 21% surgeons/2% physiotherapists *p*=0.01).

3.5 Definition of Recurrent Patellar Dislocations

Almost 40% of surgeon respondents (39%; n=13) indicated that a patient who reports two patellar dislocations should be defined as recurrent dislocations. Similar numbers of respondents suggested more than two dislocations (24%; n=8). Eighteen percent (n=6) suggested recurrent dislocation should be defined by one patellar dislocation and two or more patellar subluxations (18%; n=6). Over half of the physiotherapists suggested patellar dislocation should be defined as more than two patellar dislocation (61%; n=25), whilst 24% suggested this should be defined as two patellar dislocations (24%; n=10). Twice as many surgeons (24%; n=8) than physiotherapists (9.7%; n=4) considered patellar subluxation to be a clinical feature of a recurrent patellar dislocation (**Table 6**).

3.6 Assessment Tools

The most frequently reported tests used always or often by respondents for assessing recurrent patellar dislocation were: hypermobility, (surgeons 97% n=32/33; physiotherapists 71% n=29/41), patella apprehension (surgeons 94% n=31/33; physiotherapists 68% n=28/41) and patellar positioning (surgeons 90% n=30/33; physiotherapists 73% n=30/41). Similarly common tests included: lower limb muscle strength (surgeons 82% n=27/33; physiotherapists 97% n=40/41), functional movement quality (surgeons 76% n=25/33; physiotherapists 90% n=37/41) and presence of an effusion (surgeons 82% n=27/33; physiotherapists 81% n=33/41). These data indicate that there was a difference between the most frequently used tests between the professions.

Several respondents reported not being aware of some of the tools listed. Two surgeons reported not being aware of 'patellar glide' and two surgeons the 'lower leg muscle length'. One surgeon reported not being aware of the 'patient reported outcome measure'. Four physiotherapists were not aware of the 'J-sign' and two physiotherapists were not aware of hip 'anteversion/retroversion'.

Twelve surgeons reported never using four items, (lower limb muscle length (9% n=3/33), Q angle (6% n=2/33), functional movement quality (3% n=1/33) and hip anteversion/retroversion (3% n=1/33).

Twenty-one physiotherapists reported never using nine items (Q angle (22% n=9/41), patella glide (5% n=2/41), hip anteversion/retroversion (5% n=2/41), patellar positioning (5% n=2/41), lower leg muscle length (5% n=2/41), palpation of medial retinaculum (2% n= 1/41), J-sign (2% n=1/41), patient reported outcome measures (2% n=1/41), presence of effusion (2% n=1/41).

3.7 Patient Reported Outcome Measures (PROMS)

Of the 10 PROMs presented to the respondents, surgeons reported using the Tegner Activity Level Scale (Tegner & Lysholm 1985) most frequently (36%; n=11/31) reporting they use this scale always/often with 8% (n= 3/38) of physiotherapists using this scale always/often. Physiotherapists reported using the patient reported satisfaction scale most often with 59% (n=23/39) reporting using this scale always/often whilst 29% (n=8/28) of surgeons reported using this scale always/often. The least used scale for both groups was the Fulkerson Knee Instability Scale (Fulkerson & Shea 1990) with 82% (n=23/28) of surgeons and 84% (n=31/37) of physiotherapists reported never using this scale.

4. Discussion

The findings of this study showed a similarity between the assessments of orthopaedic surgeons and physiotherapists of patellar dislocations and when physiotherapy has been exhausted. Disparity between the professions on the definition of recurrent patellar dislocation and on the decision-making around surgical consideration was found.

The reasons for the disparity in management of the vignettes in this study are unclear. One explanation may be the study respondents mirrored the ambiguity in the literature on how many recurrent

dislocation episodes need to occur before surgery should be considered. This is also reflected in the disparity seen between the professions on the definition of recurrent patellar dislocations.

Vignettes are techniques which explore variations in practice and adherence to best practice guidance (Converse et al 2015). Due to the complex nature of this topic and the limited evidence-base only limited assumptions can be made regarding adherence to best practice and any clinical implications on variation should be viewed judiciously. The low level of agreement amongst the respondents of this study reflects the literature which shows a wide variation in clinical care for patellar dislocations (Bailey et al 2021, Blond 2017).

The differences in opinion on the timing of a surgical opinion between the professions is new information. Little evidence exists to suggest when surgery may be more beneficial than physiotherapy (Moiz et al 2018), it is not possible therefore to conclude whether the preference of the surgeons or the physiotherapists is the optimum choice. A definitive randomised control trial for recurrent patellar instability has been shown to be feasible (Rahman et al 2020); and this study highlights this as a research priority.

The disparity found between the professions suggests a need for more robust guidance/education. In particular, around the presence of an osteochondral injury. A small (20%) cohort of physiotherapists felt an osteochondral defect did not warrant a surgical opinion. The literature supports the use of both surgical and conservative management of these lesions; however, this is dependent upon various factors such as size, depth, and location of the lesion (Howell et al 2021). Giving the link between an osteochondral injury and the development of arthritis, this study suggests the need to promote the importance of an early surgical referral when an osteochondral defect is present following recurrent patellar dislocations.

This survey showed both professions agreed improving strength and movement control is a key goal of physiotherapy, and 'failed physiotherapy' constitutes persistent symptoms despite achieving this. This opinion aligns with current evidence which advocates the use of strength and movement retraining for patellofemoral pathologies (Rahman et al 2020, Barton et al 2015), the survey did not measure the respondents understanding of this terminology.

The results suggested that physiotherapists were less likely to consider a feeling of instability or mistrust as symptoms of recurrent patellar dislocations than orthopaedic surgeons. This reflected the level of agreement regarding the definition of recurrent patellar dislocations. Physiotherapists were less likely to consider patella subluxations as a clinical feature without multiple patellar dislocations.

The clinical importance of patellar subluxations in this cohort remains unknown. A feasibility study for a randomised control trial (Rahman et al 2020) comparing surgery and physiotherapy used an inclusion criterion of "self-reported two or more patellar dislocations or one dislocation with a minimum six-month history of subjective patellar instability". It is outside the scope of this study to define recurrent patellar dislocations; this is an area where some disagreement exists and requires further guidance.

The results indicate that hypermobility and patellar positioning, both recommended tests for the assessment of patellar instability (BOAST 2020) are used in UK practice. Both tests were utilised by over 80% of all respondents always/often. As discussed above movement patterning has a key role in patellar

instability. This is often assessed using a single leg squat. This study found 90% of respondents used this functional test, this contrasts with an earlier paper (Smith et al 2011) which found only 3% of physiotherapists reported using a single leg squat as an assessment for first-time dislocations. This study found the assessment tools utilised by surgeons and physiotherapists are similar when assessing patients with recurrent patellar dislocations and align with current best evidence.

This study presents with two important limitations which should be considered. Firstly, the sample size was relatively low despite utilising similar methodology to previously successful research (Bury & Littlewood 2016, Bateman et al 2019, Smith et al 2017, Carter et al 2021). This was exacerbated by the restricted data collection and potential pressures on respondent's time due to the COVID-19 pandemic. There is also limited geographical spread throughout the UK making it difficult to gauge the generalisability to the wider population. Secondly, the recruitment methods excluded clinicians who do not engage with social media or special interest groups, it is also difficult to measure engagement with the study from this methodology. Control was limited over clinicians completing the survey, respondents had to confirm they were eligible during consent and a further screening question was in place before full access to the survey, however, we cannot guarantee only orthopaedic surgeons or physiotherapists completed the survey.

5. Conclusion

This paper explores the decision-making between UK based orthopaedic surgeons and physiotherapists on the timing of a surgical assessment for recurrent patellar dislocations. Variations in practice is well known and differences between professions is to be expected. Optimum management of patellar dislocations is considered to be multidisciplinary, agreement between the MDT is paramount to good clinical practice. Results showed assessment methods were similar for both professions and aligned with current best evidence. Some agreement exists surrounding the interpretation of 'failed physiotherapy'. However, there was low level of agreement found between the professions on the timing of a surgical opinion and the key findings which would prompt a surgical referral. Future guidelines and clinical recommendations should involve both surgical and physiotherapy professionals to improve agreement for the management of this complex patient group.

Declaration of Competing Interest

The authors declare there are no competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

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Vignette A	Vignette B
25-year-old male with a 2nd time patellar dislocation 2 weeks ago. His patella dislocated during a football match and was relocated in the emergency department. His first dislocation was 5 years ago during a football match. He had a course of physiotherapy and was able to return to sport without any issues until today. He is keen to have a surgical opinion as he feels he can no longer trust his knee and feels he 'needs something done about it' A post-reduction x-ray showed a haemarthrosis, no obvious bony injury and normal patella positioning. In clinic he had an effusion, full extension, he was able to activate his quads but struggled to straight leg raise. He was tender to palpate the medial boarder of his patella, medial retinaculum, and medial femoral condyle. His patella glide was > 3 quadrants with apprehension compared with his opposite knee which had a glide of 1 quadrant.	38-year-old female with a history of recurrent bilateral patellar dislocations since she was a teenager. Right knee is the worst. She has had multiple courses of physiotherapy which did not help and were mainly quadriceps exercise based. She used to play a lot of hockey but stopped because her right knee felt too unstable. She tries to do her physiotherapy exercises when she remembers. Since the birth of her 1st child 18 months ago her right knee feels more unstable. Pre-pregnancy she would self-re-locate her patella 2-3 times a year which would leave her with some pain, but she would not seek medical attention and would return to her usual level of activity. Recently she has had more episodes of dislocations and no longer trusts her knee. She can remember seeing a doctor when she was a child who told her she was hypermobile and that she would need an operation on her knee in the future. She is worried that her knees have deteriorated and that she now needs the operation. Examination findings: Beighton score 8 marked reduced quads bulk poor hip knee and trunk control with single leg squat muscle weakness in glutei and quads 4/5 positive patellar apprehension bilaterally patella glide >3 quadrants mild J sign X-ray showed patella alta, no degenerative changes

Table 1: Vignettes presented in the online survey

Respondent Number *n*(%)	Question					
	What is your primary job role?					
	Consultant Orthopaedic Surgeon	Consultant Orthopaedic Knee Surgeon	Consultant Orthopaedic Knee Surgeon with special interest	Orthopaedic Registrar		
n=38	14 (36.8)	14 (36.8)	7 (18.5)	3 (7.9)		
	What area is your primary job?					
	NHS	Private Medical Provider	Own Practice/Self-employed	Sport		
n=38	34 (89.5)	2 (5.4)	1 (2.5)	1 (2.5)		
	Please indicate any other areas you work in					
	Private Medical Provider	Own practice/self employed	Charitable Organisation	Sport	Non-NHS Public Sector	other
n=42*	18	9	1	7	2	5
	What is the location of your primary work?					
	England	Northern Ireland	Scotland	Wales		
n=38	36 (94.8)	1 (2.5)	1 (2.5)	0		
	In a typical year, how many patellofemoral stabilisation surgeries do you perform?					
n=38	Consultant Orthopaedic Surgeon	Consultant Orthopaedic Knee Surgeon	Consultant Orthopaedic Knee Surgeon with special interest	Orthopaedic Registrar	Total *n*(%)	
I do not perform this operation	3	0	0	1	4 (10.5)	
<3	2	1	0	0	3 (7.8)	
3-5	0	1	0	1	2 (5.2)	
6-10	1	3	0	0	4 (10.5)	
11-15	1	4	3	0	8 (21)	
15-20	3	1	1	1	6 (15.8)	
>20	4	4	3	0	11 (29)	
	In a typical year what % of your recurrent dislocation patients do you operate on?					
n(%)	Consultant Orthopaedic Surgeon	Consultant Orthopaedic Knee Surgeon	Consultant Orthopaedic Knee Surgeon with special interest	Orthopaedic Registrar	Total *n*(%)	
0%	4	0	0	1	5 (12.5)	
1-4%	0	0	0	0	0 (0)	

5-15%	2	3	0	1	6 (15)
16-30%	3	3	1	0	9 (22.5)
30-50%	1	3	3	0	7 (17.5)
>50%	4	5	3	1	13 (32.5)

T**able 2**: Surgeon characteristics * Respondents worked in more than one secondary area

Respondent number	Question					
	What is your primary job role?					
	Equivalent NHS Band5	Equivalent NHS Band 6	Equivalent NHS Band 7	Equivalent NHS Band 8a or above	Other	
n=46	1 (2.1)	11 (23.9)	17 (36.9)	15 (32.6)	2 (4.3)	
	What area is your primary job role?					
	NHS	Private Medical Provider	Own Practice/Self Employed	Non-NHS public sector	Sport	
n=46	39 (84.7)	3 (6.5)	2 (4.3)	1 (2.1)	1 (2.1)	
	Please indicate any other areas you work in					
n=19	Private medical provider	Own practice/self employed	Non-NHS Public Sector	Sport	Other	
	4	7	0	4	4	
	What is the location of your primary job?					
n=46	England	Northern Ireland	Scotland	Wales		
	41 (89.2)	2 (4.3)	2 (4.3)	1 (2.1)		
	In a typical year, what % of your monthly caseload would you estimate are recurrent patellar dislocations?					
n=46	Equivalent NHS Band 5	Equivalent NHS Band 6	Equivalent NHS Band 7	Equivalent NHS Band 8/above	Other	Total *n*(%)
<3	1	4	6	2	0	13 (28.4)
3-5	0	5	7	4	0	16 (34.7)
6-15	0	2	3	6	2	13 (28)
16-30	0	0	1	2	0	3 (6.5)
30-50	0	0	0	0	0	0 (0)
>50	0	0	0	1	0	1 (2.1)
	In an average year, what % of your recurrent patellar dislocation patients do you refer for a surgical opinion?					
n=46	Equivalent NHS Band 5	Equivalent NHS Band 6	Equivalent NHS Band 7	Equivalent NHS Band 8a/ above	Other	Total *n*(%)
I cannot refer directly on	0	5	5	0	1	11 (24)
1-3%	0	3	7	6	0	16 (34.7)
3-9%	1	0	1	2	1	5 (11)
10-15%	0	1	1	4	0	6 (13)
16-30%	0	1	2	1	0	4 (8.6)
31-50%	0	1	1	1	0	3 (6.5)
>50%	0	0	0	1	0	1 (2.1)

Table 3: Physiotherapist's characteristics

Which management plan do you feel most appropriate for Case Study A and B?				
	Surgeons		Physiotherapists	
	Case A	Case B	Case A	Case B
1. Early Physiotherapy and early surgical opinion	36.8%	55.6%	17.3%	35.7%
2. Early physiotherapy and surgical referral depending on outcome	23.6%	16.7%	60.8%	35.7%
3. Early surgical opinion and delay physiotherapy depending on surgical outcome	0%	5.6%	0%	7.1%
4. Physiotherapy only	0%	8.3%	4.3%	16.6%
5. Investigate further	31.5%	13.8%	8.7%	4.7%
6. other	7.9%	0%	8.7%	0 %

Table 4: Results from the surgeon and physiotherapist responses to the decision-making for Case Study A and B.

	Definitions of 'Failed Physiotherapy'	Frequency of response Agree/strongly agree (%)		*P*-Value
		Surgeon	Physiotherapist	
Statement 1	Patient has completed 6 sessions of physiotherapy and remains symptomatic of instability	15%	7%	.45[1]
Statement 2	Patient has completed 6 months of physiotherapy and remains symptomatic of instability	64%	56%	.63[1]
Statement 3	Patient has optimum strength and movement control and still experiences feelings of instability	85%	59%	.18[2]
Statement 4	Patient has optimum strength and movement control but has experienced further dislocations	91%	83%	1.0[2]
Statement 5	Patient has optimum strength and movement control but does not trust their knee	79%	51%	.003[2]
Statement 6	Patient's ability to progress in physiotherapy is limited but pain and swelling	42%	41%	.90[1]
Statement 7	Patient does not wish to engage in physiotherapy as it is a waste of their time	9%	12%	.71[2]
Statement 8	Patient would like to stop seeing physiotherapy and see a surgeon whilst still having poor strength and control	21%	2%	.01[2]

Table 5: Agreement of definition of 'failed physiotherapy' [1] Chi Square test with Yates Correction Continuity [2] Fishers Exact Test

	Surgeon *N=33 (%)*	Physiotherapist *N=41 (%)*	Total *N=74 (%)*
1. 1 patellar dislocation and 1 patellar subluxation	1 (3)	1 (2.4)	2 (2.7)
2. 1 patellar dislocation and 2 or more subluxation episodes	6 (18.2)	2 (4.9)	8 (10.8)
3. 0 patellar dislocations but 2 patellar subluxation episodes	1 (3)	1 (2.4)	2 (2.7)
4. 0 patellar dislocations but > 2 patellar subluxation episodes	0 (0)	0 (0)	0 (0)
5. 2 patellar dislocations	13 (39.4)	10 (24.4)	23 (31)
6. >2 patellar dislocations	8 (24.2)	25 (61)	33 (44.5)
Other	4 (12.1)	2 (4.9)	6 (8.1)

Table 6: Frequency of definition of a recurrent patellar dislocation