

Clinical reasoning for the continuation or discontinuation of hip precautions after total hip arthroplasty in Switzerland: a qualitative study

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Summary

BACKGROUND: Growing evidence raises doubts about the need for routine hip precautions after primary total hip replacements to reduce the risk of postoperative dislocation. However, hip precautions are still routinely and widely prescribed in postoperative care in Switzerland. We aimed to investigate experts' clinical reasoning for hip precaution recommendations after total hip arthroplasty.

METHODS: Using a convenience sampling strategy, 14 semi-structured expert interviews were conducted with surgeons, physiotherapists, and occupational therapists in the vicinity of an inpatient rehabilitation clinic in Switzerland. Data analysis followed Mayring's principle of inductive and deductive structuring content analysis.

RESULTS: Expert statements from the interviews were summarised into four main categories and 10 subcategories. Categories included statements on the incidences of dislocation and underlying risk factors; current preferences and use of hip precautions; their effect on physical function, anxiety, or costs; and patient's adherence to the movement restrictions. Hip surgeons routinely prescribed hip precautions, although in different variations. Fear of dislocation and caution are barriers to changing current practice. Some surgeons are considering individualised prescribing based on patients' risk of dislocation, which therapists would welcome.

CONCLUSION: A lack of clear instructions from the surgeon leads to ambiguity among therapists outside the acute hospital. A shared understanding of the need for and nature of hip precautions, guidelines from societies, or at least specific instructions from surgeons to therapists are warranted.

Introduction

Performed for over 100 years, total hip arthroplasty is one of the most common orthopaedic operations performed worldwide. It involves replacing the femoral head and components of the hip joint with a new artificial joint [1, 2]. Since 2015, the Swiss National Hip and Knee Joint Registry (SIRIS) has documented more than 100,000 primary total hip arthroplasties, with osteoarthritis as the primary indication in 83.9% of cases [3]. While total hip

arthroplasty has been described as the surgery of the century and the treatment of choice for hip arthritis [4], adverse events requiring revision cannot always be prevented. According to the SIRIS data from 2016–2019, 2.6% of cases required a first revision within 24 months after primary total hip arthroplasty. The most common reasons for early revision were infection (25.0%), periprosthetic fracture (18.9%), femoral loosening (18.3%), and dislocation (14.5%) [3].

Postoperative care traditionally includes hip precautions to reduce the risk of dislocation. Patients are advised to avoid certain movements such as hip flexion beyond 90°, hip adduction beyond the midline, and external (anterior approach) or internal (posterior approach) hip rotation beyond 20° from neutral. Patients are often provided with assistive devices, such as furniture raises and dressing aids, to enable or facilitate compliance with these restrictions [1]. However, there is limited evidence on the effectiveness of hip precautions in preventing dislocation. Systematic reviews and meta-analyses found low dislocation rates (<2.2%) regardless of whether hip precautions, minimal hip precautions, or no hip precautions were prescribed [5, 6]. Other studies not included in these meta-analyses reached the same conclusion and questioned the benefit of prescribing hip precautions in postoperative care after total hip arthroplasties [7–10].

In contrast, studies on the effect of hip precautions on patients' functional capacity and self-reported outcomes have reported conflicting findings. Some studies found an earlier return to work, better resumption of activities of daily living, higher patient satisfaction, and greater sleep time [5, 10, 11] in patients without hip precautions. However, some studies found no effect of hip precautions on functional recovery and patient-reported outcomes [9, 12]. A qualitative study investigating patients' perceptions of hip precautions found that discontinuing precautions may reduce patients' fear of dislocation. In contrast, patients perceived precautions as reassurance and guidance in postoperative care [13].

Despite the lack of evidence of additional benefit, strict hip precaution protocols are still commonly used in the postoperative care of patients after total hip arthroplasties. A qualitative study in the UK explored the clinical reasoning of surgeons, physiotherapists, and occupational therapists

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as to why they continued or discontinued recommending hip precautions. Clinicians continued to prescribe hip precautions to minimise the risk of dislocation. In their view, there is insufficient evidence to justify a change in practice. They also pointed to the devastating consequences for patients in the event of dislocation. Clinicians who no longer routinely prescribed hip precaution justified their decision with the low risk of dislocation due to advances in surgical techniques, better patient experience, and costs associated with hip precaution [14].

Clear guidelines from societies advising for or against hip precautions are missing. In Switzerland, whether or not hip precautions are prescribed depends largely on the treating surgeon and clinic. Therefore, in this study, we aimed to investigate hip surgeons' clinical reasoning for recommending hip precautions to patients after hip replacement surgery. In addition, we aimed to explore the perceptions of experts in physiotherapy and occupational therapy regarding hip precautions.

Materials and methods

Study design

This study used a descriptive design with qualitative content analysis. Qualitative content analysis can be used to describe the manifest content (the visible, surface components of a text) or interpret the latent content (the underlying meaning of a text), resulting in varying degrees of depth and abstraction [15].

Following common research practice, this study used expert interviews to acquire information. Therefore, qualitative content analysis was chosen because it focuses on reconstructing information on circumstances or processes around a phenomenon [16].

Sampling and recruitment

A convenience sampling strategy was used among the surgeons with the highest referrals of patients to the inpatient rehabilitation clinic Berner Reha Zentrum in Switzerland after primary hip arthroplasty. This clinic treats more than 100 patients per year after hip replacement.

The inclusion criteria were a senior position or higher and regularly performing primary hip replacement surgeries. We aimed to conduct 12–15 interviews with surgeons or until theoretical saturation was reached. Thirty surgeons were contacted by e-mail; nine agreed to participate, and 21 did not respond.

In Switzerland, since physiotherapy and occupational therapy are usually provided on medical prescription, a close collaboration between physicians and therapists is essential, especially in rehabilitation. To include the therapists' perspective, two physiotherapists and two occupational therapists from inside and outside the rehabilitation clinic were recruited using a convenience sampling strategy. The inclusion criteria were a senior position to ensure extensive experience with patients after primary hip arthroplasty. All participants were informed about the study's purpose and procedures and provided written informed consent.

Data collection

The research team developed a semi-structured interview guide (supplementary materials in the appendix, tables S1 and S2) based on previous literature [14]. The questionnaire comprised open-ended questions relevant to clinical practice to elicit the experts' opinions and knowledge. The topics covered were the surgery and associated risk of dislocation, the patient's perspective, the advantages and disadvantages of hip precaution, and advances in surgery and therapy. The interview guide was reviewed after the first interview. Since only minor changes (order of questions and prompts) were necessary, the interview was included in the analysis.

Interviews were conducted online, by phone, or in person at the hospital according to the respective expert's preference. All interviews occurred between June and September 2021 and were conducted by one investigator (JK), who holds a Bachelor of Science (BSc), candidate Master of Advanced Studies (MAS) in Physiotherapy and is Deputy Head of Therapy at the Berner Reha Zentrum. One investigator (LR) with extensive experience in qualitative research provided methodological training. The interviewer knew one of the surgeons professionally since they regularly referred patients to the investigator for physiotherapy. However, it was made clear that the interview was not work-related and for research purposes only. There was no direct contact between the investigator and other surgeons before the interviews. One of the physical therapists and one of the occupational therapists were coworkers of the interviewer at the rehabilitation clinic. Interviews lasted between 16 and 57 minutes and were audio-recorded and then transcribed verbatim. One interview was repeated due to technical problems during the first attempt. The transcripts were provided to participants for comments and corrections.

Data analysis

Data analysis followed Mayring's principle of inductive and deductive structuring content analysis [17]. Main categories and subcategories were deductively set based on the thematic blocks of the interview guide and previous literature [14]. A coding guide with a definition, an anchor example, and a coding rule for each subcategory was created (table 1). Next, all transcripts were read, and the meaning units were allocated to subcategories. The meaning units could range from one word (smallest coding unit) to multiple sentences. Inductively formed categories were included in the coding guide if relevant text passages could not be assigned to any existing category. After reviewing 50% of the material, the research team critically discussed and revised the coding guide. Subcategories were specified or merged to achieve sufficient discriminating power between categories. Finally, all material was coded using the final category system. Coding was managed using the f4analyse software (dr. dresing & pehl GmbH). For this manuscript, some categories were consolidated or omitted if not considered relevant to its aim (e.g. surgery details), resulting in the final categories shown in table 1. One investigator (JK) performed all coding.

Ethical consideration

This study on human participants did not require ethical approval based on local legislation. Confidentiality and data protection were ensured, and only the interviewer could access the de-identified data stored on a local computer. Written informed consent was obtained from all study participants.

Results

The experts' characteristics, including details of their professional experience and use of hip precautions, are shown in table 2. All data provided in table 2 were self-reported by the expert during the interview. Eight surgeons primarily use the minimal invasive anterolateral approach for hip replacements, while one (S9) uses an anterior ap-

proach. All surgeons stated that they test the dislocation tendency during the surgery by bringing the hip with a test joint into extreme dorsal and ventral motions, including rotations, before applying the final prosthesis. Further interview findings were summarised into the four main categories and 10 subcategories shown in table 1. Representative quotes (translated from German and Swiss German into English) are provided for each category, as appropriate.

Hip dislocations

The incidence of dislocation was generally reported to be low. Its decreasing incidence over the years has been attributed to the advent of anterolateral and anterior surgical ap-

Table 1:
Coding categories based on the interviews and coding guide.

Category	Subcategory	Description
1. Hip dislocations	1.1 Incidence	<i>Explanations for the current low incidences of hip dislocations</i>
	1.2 Causes of dislocation	<i>Factors that enhance the risk of postoperative hip dislocations</i>
	1.3 Consequences	<i>How experts perceive hip dislocations and their consequences</i>
2. Preferences and use of hip precautions	2.1 Own attitude towards hip precautions	<i>Statements if and why they have questioned the evidence and use of hip precaution measures</i>
	2.2 Patient-targeted prescriptions	<i>If and based on what factors they use or would consider individualised hip precaution recommendations</i>
	2.3 Surgeon – therapist information transfer	<i>If and how information on hip precaution prescriptions gets from the surgeon to the therapist</i>
3. Perceived effects of hip precautions	3.1 Physical functioning	<i>Effects of the use or non-use of hip precaution on physical functioning, such as strength or mobility</i>
	3.2 Anxiety	<i>Patients' anxiety of postoperative dislocations and the influence of hip precautions on anxiety</i>
	3.3 Cost	<i>Financial, personnel, or time costs for hip precaution instructions</i>
4. Adherence	4.1 Adherence	<i>Patients' willingness and ability to follow hip precaution measures</i>

Table 2:
Interviewed experts' characteristics.

	Setting	Professional experience (in years)	Primary hip replacement surgeries per year	Number of dislocations	Hip precaution prescription			Physiotherapy prescription
					Movement restrictions	Duration	Frequency	
S1	Private hospital	26	40	None in 15 years	Hip flexion >90° Hip adduction	Six weeks	Routinely	Set individually
S2	Private hospital	23	80–100	None in 15 years	Hip flexion >90° Hip adduction	Six weeks	Routinely	Routinely
S3	Public hospital	20	50	One in six years	Hip flexion >90° Active straight leg raise	Five weeks	Routinely	Routinely
S4	Private hospital	16	80	Two in five years	Hip flexion >90° Hip adduction Hip rotation	Six weeks	Routinely	Routinely
S5	Public hospital	15	50	Three in six years	Hip flexion >90°	Four weeks	Routinely	On patient request
S6	Public hospital	25	150	One in three years	Hip flexion >90° Internal hip rotation	Set individually	Set individually	Routinely
S7	Public hospital	20	300	Two per year	Hip flexion >90° External hip rotation	Six weeks	Routinely	Routinely (passive therapy only)
S8	Private hospital	31	40–50	One in two years	Hip flexion >90° Hip adduction	Six weeks	Routinely	Routinely
S9	Private hospital	18	80	None so far	Hip flexion >90° External hip rotation	Six weeks	Set individually	Routinely
P1	Public hospital	13	–	–	–	–	–	–
P2	Self-employed	16	–	–	–	–	–	–
O1	Reha clinic	29	–	–	–	–	–	–
O2	Rehab clinic	22	–	–	–	–	–	–

S1–S9: surgeons; P1–P2: physiotherapists; O1–O2: occupational therapists.

proaches, the growing experience with these surgical techniques, and the use of larger joint implant heads and offset reconstruction.

“(….) it is combined two things (….) that we see less dislocations nowadays. On the one hand the approach and on the other hand bigger heads.” (S1)

“The main reason for less dislocations is that offset reconstruction has simply become more important (….)” (S3)

Both patient and surgeon characteristics have been identified as risk factors for postoperative hip dislocations. For example, unfavourable soft tissue leverage may cause dislocations in patients with severe obesity. Inactivity, hemiparesis, spondylosis or muscular insufficiency in patients were also considered risk factors.

“(….) if someone had a back surgery and a stiffening, then the pelvic tilt can change in a sitting position which can be dangerous (….)” (S7)

“(….) you can dislocate a hip only with soft tissues, with the upper thigh in highly obese patients (….)” (S1)

One surgeon also noted the timing of dislocations and that most occur relatively soon after surgery, probably due to anaesthesia and low muscle tension. However, some surgeons identified errors during surgery as the main factor for dislocations.

“(….) that means, the main factor for dislocations is simply the surgeon. That needs to be said.” (S9)

“The most frequent cause is probably a malpositioning of the prosthesis components, that something went wrong or not optimal during the primary implantation (….)” (S5)

Despite the low incidence of postoperative hip dislocation, surgeons remained concerned about dislocations, given the consequences for patients and surgeons.

“(….) but when it happens, it's very inconvenient for everyone, for patients and for surgeons.” (S8)

“(….) basically any complication is a problem that I take personally.” (S1)

Preference and use of hip precautions

An overview of surgeons' use of hip precautions is shown in table 1. There was some heterogeneity among surgeons in the use of hip precaution measures. While all surgeons recommend that patients avoid hip flexion of more than 90°, only some recommend restricting hip rotation, hip adduction, or both as part of their hip precaution routine.

Eight of the nine surgeons routinely prescribed hip precautions for 4–6 weeks postoperatively, while only one reported prescribing hip precautions on an individual basis. Most hip surgeons did not consider strict adherence to hip precautions essential but rather as a relic of a long tradition. Nonetheless, they were still reluctant to discontinue hip precautions in general.

“I think that it is just in the clinical routine of many [surgeons] from earlier(….) it might indeed be important to reconsider this topic (….)” (S4)

“I feel that it [omitting hip prophylaxis] is possible. But it is simply dangerous (….) Because if you don't do it, I think you have more dislocations.” (S7)

Two surgeons suggested that older surgeons may be more reluctant than younger surgeons to waive hip precautions

because of their experience with the risk of earlier surgical approaches.

“I grew up in a generation with the minimally invasive approach (….) the corresponding implants (….) and very many colleagues (….) they just experienced different times. They primarily performed surgeries using the transgluteal or dorsal approach (….)” (S5)

The surgeons also emphasised that changes in practice may be easier in a public hospital with hierarchical structures than in a private hospital with affiliated physicians.

“(….) we agree on a scheme. (….) I think there is a difference between an affiliated doctor system and a public hospital, where the boss says that's the way it is (….)” (S9)

Some surgeons would consider an individualised prescription based on patient and/or surgery characteristics as best practice.

“(….) if you know the risk could be higher, that you explicitly prescribe [hip precautions] there, but with all other prostheses becomes much more generous.” (S4)

One surgeon even suggested that the decision to prescribe hip precautions be left to a physiotherapist. However, therapists prefer individual prescriptions by the surgeon based on the complexity of the patient and surgery, or at least an assessment by the surgeon of the importance of hip precautions for the respective patient.

“It should be done (….) by a physiotherapist who might do a brief assessment and then provide adapted measures.” (S8)

“It would be good, of course, if we knew directly from the surgeon (….) ok, here it's really delicate (….) and to treat others, without considering certain movement restrictions.” (O1)

“(….) perhaps depending on how the surgeon performed the operation or how complex the procedure was.” (P1)

One surgeon does not prescribe active physiotherapy to avoid potential damage due to torsional forces. Others leave the decision to stop hip precautions to the treating therapists. However, therapists agree that surgeons do not include specific information regarding hip precautions in their therapy prescriptions. Sometimes, surgeons mention a treatment scheme but without specifics, leading to uncertainty about further treatment.

“(….) they have control appointments with the physiotherapist already two weeks after (….) then it depends on how well the people are.” (S4)

“They [the surgeons] assume that we know it [the treatment scheme] and instruct accordingly. But I have never read any hip precaution instructions on a prescription.” (P2)

“(….) if nothing is written, then you already ask yourself (….) do they [patients] have to pay attention to anything?” (O1)

Effects of hip precautions

All interviewed experts agreed that hip precautions do not affect patients' strength. While some surgeons believed that a patient's flexibility might be restored more quickly without hip precautions, others believed that the range of motion in flexion and extension is not reduced after surgery. In contrast, therapists agree that hip precautions prevent patients from regaining mobility after surgery.

“(...) I could imagine that omitting hip precautions might have a positive effect on the range of motion later on. That they have a better range of motion earlier.” (S1)

“I have not seen any hip prosthesis with a bad range of motion as far as flexion extension is concerned.” (S3)

“(...) If they do not bend more than 90° for six weeks and then try to bend all the way to their shoes, they will probably have some problems (...).” (P1)

Surgeons and therapists reported that patients often fear dislocation and that hip precaution instructions sometimes increase this fear. Seven surgeons also mentioned the negative impact of preoperative patient education about dislocation.

“First, I talked about it [risk of dislocations] in the information meeting prior to surgery (...) and at time of surgery, their greatest concern was that their hip might dislocate.” (S4)

“There are patients who are already a bit anxious and reserved anyway, and with them, you would not need to instruct [hip precaution] at all. Just say: you are allowed to do that and this (...).” (O1)

Surgeons and physiotherapists estimated the financial impact of hip precautions to be relatively low and the time needed to instruct hip precaution measures in the postoperative hospital setting as 3–30 minutes. In contrast, hip precautions are a major part of the therapy plan for occupational therapists and are repeatedly discussed and trained with patients during activities of daily living.

“I would say the influence there is small. Actually, not really present, and if it is, it is marginal.” (S4)

“You would have to calculate half an hour per patient during the entire hospitalisation.” (S5)

“(...) with the geriatric patients, it can quickly be five hours during rehab for these things, because that is an important part of the rehabilitation, these hip precautions.” (O2)

One therapist noted that some patients may need home care if they are limited in activities of daily living due to hip precautions, which may lead to health costs. Otherwise, the experts agreed that costs for aids are low (80–100 CHF) and that hip precautions do not affect the hospital stay length.

Adherence

According to the surgeons, adherence to hip precautions varies substantially between patients. While some patients are compliant after one instruction, others would not understand its importance or how to follow the recommendations in their daily lives.

“(...) there are patients with good body awareness. You have to tell them once. And then there are patients (...) you already think: Ok, they have understood, but they are in a posture that actually does not work. There's the whole range there.” (S7)

After observing how patients completely ignore the precautions when performing everyday activities, therapists involved in postoperative care question the value of hip prophylaxis. Patients often do not comply with hip prophylaxis despite repeated instructions, and it is considered a

success if patients only remember not to bend the hip more than 90°.

“I always have my doubts with patients who are doing everything anyway. In the acute hospital, nobody intervened, and now they come to us, and we have to instruct hip precautions. (...).” (O1)

“If we get them to understand not to bend the operated leg over 90 degrees, but show them another method, then we have already achieved a lot (...).” (O2)

Discussion

Main findings

This study provides insight into experts' clinical reasoning and experience regarding the need for hip precautions after primary hip arthroplasty. All surgeons acknowledged the paucity of evidence for the benefit of hip precautions, given the novel surgery approaches and the associated low incidences of dislocation. They noted that continuing to routinely prescribe hip precautions is based on customs rather than evidence. However, to avoid any risk, most interviewed surgeons would be reluctant to waive hip precautions in general. Nonetheless, some surgeons would instead give individual recommendations based on patient characteristics and how well their surgery went. Therapists would welcome an individualised, explicit hip precaution prescription from the treating surgeons, including specific measures, because hip precautions may impede patient recovery, and the instruction takes up a significant amount of therapy time, especially during inpatient rehabilitation.

The statements from the surgeons regarding the current low incidence of dislocations and underlying risk factors such as age, lumbosacral pathology, or femoral head size are consistent with the literature [18]. Despite increasing evidence that hip precautions do not reduce dislocation rates, most surgeons are unwilling to change their practice. Despite their confidence in their own skills and materials, most hip surgeons would like to continue with hip precautions to ensure the best possible patient safety and avoid any risk and possible litigation. These findings are nearly identical to comparable studies conducted in the UK [14, 18]. Clinicians in the UK who do not routinely advise hip precautions similarly stressed that they would still provide individualised advice to those patients at high risk of dislocations. Surgeons in our study and the previous studies described above had a precise idea of patients they consider at risk for dislocations and named patient- and surgery-related characteristics. While Mandel et al. also interviewed experts from clinics that had discontinued routine hip precautions [14], only one surgeon in their study prescribed hip precautions on a case-by-case basis. Unlike our study, they found a general agreement on the definition of standard hip precautions. However, in our study, the definition of hip precautions differed between surgeons regarding the type of movement restriction and the duration.

The interviewed therapists would prefer to instruct hip precautions only for patients at risk of dislocation, given the potential negative consequences of hip precautions and the time required for instruction. Based on their experience, hip precautions limit patients in their daily activities and may impede them in restoring their range of motion. This

perception is supported by studies that found an earlier return to work, better resumption of activities of daily living, higher patient satisfaction, and greater sleep time [5, 10, 11]. However, a recent before-and-after study found better physical function and less pain in the first week after surgery when hip precautions were omitted, but no differences in recovery of physical function six weeks and three months after surgery [9]. Both surgeons and therapists agree that hip precautions may increase patient's anxiety and fear of dislocation, especially if they were already anxious before surgery. This observation is consistent with a study on patient perception that found greater fear of dislocations in patients who received hip precaution measures compared to patients who did not [13].

The time spent instructing patients seems to differ between settings and/or professions. Surgeons estimated the time needed to instruct hip precautions as relatively low (3–30 minutes), while the instruction and monitoring of hip precautions comprise a considerable part of the treatment time for occupational therapists in inpatient rehabilitation clinics. Both surgeons and therapists observed that patients did not always adhere to the hip precautions despite instructions. However, evidence regarding adherence to hip precautions is sparse. In a recent study, 24% of the patients reported being unable to adhere to precautions for more than 90% of the time. Supine sleeping was reported as challenging to adhere to, whereas the recommendations to avoid crossing legs and use an elevated chair are easy to follow [20]. To our knowledge, there are no objective measures of adherence to hip precautions and their successful implementation in daily life.

Relevance for practice

Without strong evidence (i.e. large, well-conducted multicentre randomised clinical trials) showing that discontinuing hip precautions does not lead to higher incidences of postoperative dislocations, it is unlikely that the current practice will change and hip precautions will be omitted entirely from aftercare. However, given the potential negative consequences of hip precautions, it may be beneficial to prescribe hip precautions only to those for whom it is considered essential to prevent hip dislocations. There seems to be an agreement between experts that it may be safe to prescribe hip precautions on a case-by-case basis, considering the risk of dislocation for the individual patient.

Surgeons generally seem to have very different perceptions of physiotherapists' competencies. While one surgeon in our study suggested leaving the decision regarding hip precautions entirely to physiotherapists, another does not prescribe any active physiotherapy. If the risk of postoperative dislocations depends mainly on how the surgery was performed, as mentioned by some of the surgeons, it may be infeasible for therapists to identify all patients at risk.

Nonetheless, the importance, type, and duration of the hip precautions recommended by the surgeon should also be communicated to therapists outside acute hospital care. Our study has shown that the prescribed types and duration of movement restrictions seem to differ among surgeons. Consequently, therapists in the outpatient setting or tertiary inpatient rehabilitation clinics are currently faced with patients with different hip precaution prescriptions without

any further information or dislocation risk assessment from the surgeon. Standardised hip precautions protocols or guidelines may be beneficial to facilitate interprofessional collaboration.

However, an organisational-level change in practice is likely required. One surgeon noted that a change in practice might be especially challenging in private hospitals with an affiliated physician system, where surgeons have to agree upon a postoperative treatment scheme, compared to public hospitals with hierarchical structures. In contrast, Mandel et al. hypothesised that a steep organisational hierarchy might inhibit changes in postoperative instructions, particularly since orthopaedic surgeons will suffer the consequences of litigation claims [14]. A recent UK study explored clinicians' experiences regarding implementation strategies when routine hip precautions were discontinued for selected individuals after primary total hip replacement [21]. Staff education and training in multi-disciplinary teams were considered to facilitate such a change in standard care. They found that "Hip Champions" acting as role models for other staff were crucial for the new rehabilitation protocol being widely accepted.

Clear guidelines from societies may further support changes in current practice. To our knowledge, there are no clear guidelines regarding hip precautions after primary total hip arthroplasty.

Limitations

Our study followed a descriptive qualitative methodology, and its generalizability is limited due to the small number of experts interviewed from one region in Switzerland. We planned to conduct 12–15 interviews with surgeons. However, only nine agreed to participate. It cannot be excluded that additional interviews may have revealed aspects not mentioned here. The opinions presented here cannot be considered representative of the general opinion of surgeons and therapists. However, our findings are very much consistent with comparable studies, including experts from the UK. In addition, our sample included fewer therapists than surgeons, which may limit the breadth of information on the therapist's perspective. However, the focus was set on surgeons because they are considered responsible for hip precaution prescriptions in clinical practice. Another limitation may be that all interviews were conducted and coded by one investigator with a background in physiotherapy, which may have influenced the interviews with surgeons and the understanding of the material. Moreover, we cannot exclude that the working relationship between the interviewer and some of the interviewed experts may have influenced the interviews. However, analyses were performed using predefined coding rules, and frequent discussions within the interprofessional team were used to address any underlying assumptions. In addition, we did not obtain any feedback from study participants on the findings and did not prepare a publicly available study protocol before conducting the study.

Conclusion

Almost all interviewed hip surgeons routinely recommend hip precautions to their patients. Fear of dislocation and caution are barriers to changing current practice for most

hip surgeons interviewed. Some hip surgeons would consider individualised prescribing of hip precautions, which the interviewed therapists would welcome. Hip surgeons generally seem to have different ideas about postoperative care, especially regarding the type and duration of hip precautions. Combined with a lack of clear instructions from the surgeon, this leads to ambiguity among therapists outside the acute hospital. Postoperative patient care could benefit from a common understanding of the need and nature of hip precautions. Therefore, recommendations from corresponding societies could provide clarity. If there is a shift towards individualised post-surgery rehabilitation strategies, flawless communication between hip surgeons and therapists may ensure adherence to the individualised prescribed regimen and, thus, the best possible surgical outcome.

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Potential competing interests

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References

- Smith TO, Jepson P, Beswick A, Sands G, Drummond A, Davis ET, et al. Assistive devices, hip precautions, environmental modifications and training to prevent dislocation and improve function after hip arthroplasty. Cochrane Musculoskeletal Group, editor. Cochrane Database of Systematic Reviews [Internet]. 2016 Jul 4 [cited 2020 Dec 2]; Available from: <http://doi.wiley.com/10.1002/14651858.CD010815.pub2> <http://dx.doi.org/10.1002/14651858.CD010815.pub2>.
- Knight SR, Aujla R, Biswas SP. Total Hip Arthroplasty - over 100 years of operative history. *Orthop Rev (Pavia)*. 2011 Sep;3(2):e16.
- SIRIS Report 2022 Annual Report of the Swiss National Joint Registry, Hip and Knee, 2012-2021.
- Learmonth ID, Young C, Rorabeck C. The operation of the century: total hip replacement. *Lancet*. 2007 Oct;370(9597):1508–19. [http://dx.doi.org/10.1016/S0140-6736\(07\)60457-7](http://dx.doi.org/10.1016/S0140-6736(07)60457-7).
- van der Weegen W, Kornuijt A, Das D. Do lifestyle restrictions and precautions prevent dislocation after total hip arthroplasty? A systematic review and meta-analysis of the literature. *Clin Rehabil*. 2016 Apr;30(4):329–39. <http://dx.doi.org/10.1177/0269215515579421>.
- Reimert J, Lockwood KJ, Hau R, Taylor NF. Are hip movement precautions effective in preventing prosthesis dislocation post hip arthroplasty using a posterior surgical approach? A systematic review and meta-analysis. *Disabil Rehabil*. 2022 Jun;44(12):2560–6. <http://dx.doi.org/10.1080/09638288.2020.1845404>.
- Peters A, Ter Weele K, Manning F, Tijink M, Pakvis D, Huis In Het Veld R. Less Postoperative Restrictions Following Total Hip Arthroplasty With Use of a Posterolateral Approach: A Prospective, Randomized, Noninferiority Trial. *J Arthroplasty*. 2019 Oct;34(10):2415–9. <http://dx.doi.org/10.1016/j.arth.2019.05.038>.
- Allen FC, Skinner DL, Harrison J, Stafford GH. The effect of precautions on early dislocations post total hip arthroplasty: a retrospective cohort study. *Hip Int*. 2018 Sep;28(5):485–90. <http://dx.doi.org/10.1177/1120700018762175>.
- Lightfoot CJ, Sehat KR, Coole C, Drury G, Ablewhite J, Drummond AE. Evaluation of hip precautions following total hip replacement: a before and after study. *Disabil Rehabil*. 2020 Feb;1–8.
- Tetreault MW, Akram F, Li J, Nam D, Gerlinger TL, Della Valle CJ, et al. Are Postoperative Hip Precautions Necessary After Primary Total Hip Arthroplasty Using a Posterior Approach? Preliminary Results of a Prospective Randomized Trial. *J Arthroplasty*. 2020 Jun;35(6 6S):S246–51. <http://dx.doi.org/10.1016/j.arth.2020.02.019>.
- Mikkelsen LR, Petersen MK, Soballe K, Mikkelsen S, Mechlenburg I. Does reduced movement restrictions and use of assistive devices affect rehabilitation outcome after total hip replacement? A non-randomized, controlled study. *Eur J Phys Rehabil Med*. 2014 Aug;50(4):383–93.
- Crompton J, Osagie-Clouard L, Patel A. Do hip precautions after posterior-approach total hip arthroplasty affect dislocation rates? A systematic review of 7 studies with 6,900 patients. *Acta Orthop*. 2020 Dec;91(6):687–92. <http://dx.doi.org/10.1080/17453674.2020.1795598>.
- Lightfoot CJ, Coole C, Sehat KR, Drummond AE. Hip precautions after total hip replacement and their discontinuation from practice: patient perceptions and experiences. *Disabil Rehabil*. 2020 Feb;1–7.
- Mandel RT, Bruce G, Moss R, Carrington RW, Gilbert AW. Hip precautions after primary total hip arthroplasty: a qualitative exploration of clinical reasoning. *Disabil Rehabil*. 2020 Nov;1–7.
- Graneheim UH, Lundman B. Qualitative content analysis in nursing research: concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today*. 2004 Feb;24(2):105–12. <http://dx.doi.org/10.1016/j.nedt.2003.10.001>.
- Bogner A, Littig B, Menz W. Interviews mit Experten [Internet] Wiesbaden: Springer Fachmedien Wiesbaden; 2014. [cited 2023 Jan 17]; Available from <http://link.springer.com/10.1007/978-3-531-19416-5> <http://dx.doi.org/10.1007/978-3-531-19416-5>.
- Mayring P. (2014). Qualitative content analysis: theoretical foundation, basic procedures and software solution. Klagenfurt. <https://nbn-resolving.org/urn:nbn:de:0168-ssao-395173>
- Rowan FE, Benjamin B, Pietrak JR, Haddad FS. Prevention of Dislocation After Total Hip Arthroplasty. *J Arthroplasty*. 2018 May;33(5):1316–24. <http://dx.doi.org/10.1016/j.arth.2018.01.047>.
- Coole C, Edwards C, Brewin C, Drummond A. What Do Clinicians Think about Hip Precautions following Total Hip Replacement? *Br J Occup Ther*. 2013 Jul;76(7):300–7. <http://dx.doi.org/10.4276/030802213X13729279114898>.
- Theaker J, Oldham J, Callaghan M, Parkes M. Assessment of patients' self-reported levels of adherence to postoperative restrictions following total hip replacement. *Physiotherapy*. 2022 Dec;117:1–7. <http://dx.doi.org/10.1016/j.physio.2022.04.001>.
- Lightfoot CJ, Coole C, Sehat K, Brewin C, Drummond A. Clinicians' experiences of discontinuing routine hip precautions following total hip replacement surgery: a qualitative analysis. *Disabil Rehabil*. 2022 Aug;44(16):4227–32. <http://dx.doi.org/10.1080/09638288.2021.1884759>.

Appendix

Table S1:
Interview guide: surgeons

Topic 1 (Initial questions)	Since when have you been operating on total hip arthroplasty? Since when as the responsible hip surgeon?
	How many primary total hip arthroplasties are performed by you each year?
Topic 2 (Surgery)	What is the most common surgical approach/implant type for primary total hip arthroplasty?
	Has anything changed in terms of technique, technology, approach, or implant used (or head size) from what was used at your centre in the past? If so, what?
	How is stability tested at the end of surgery?
Topic 3 (Hip precautions)	What do you mean by hip precautions, and do you use it for primary total hip arthroplasty?
	What do you think is the general rationale for using or not using hip precautions for primary total hip arthroplasty?
	What reasons would there be for prescribing individual hip precautions in the future, or how did the decision to dispense with hip precautions come about?
	Why do you think hip precautions is still so widely used?
	Have you ever questioned the hip precautions in your daily life? Why (not)?
Topic 4 (Dislocations)	What is the rate of dislocation for primary total hip arthroplasty in your clinic?
	What are the most common causes of dislocation, and when do they happen?
	If the surgery is performed well, do you think it is likely that the hip endoprosthesis will dislocate during general motion?
Topic 5 (Future)	What is the trend regarding hip precautions in 5 and 10 years? Is there a new development?
	Can you imagine that the elimination of hip precautions will lead to a shortening of the postoperative hospital stay? Why (not)?
Topic 6 (Patient)	How does the hip precautions affect the patient's anxiety level?
	How does hip precautions affect a patient's range of motion and strength postoperatively?
Topic 7 (Advantages and disadvantages)	What advantages and disadvantages do you see for patients with/without hip precautions?
	What advantages and disadvantages do you see for hospitals and rehabs with/without hip precautions?
	What is the financial impact of implementing hip precautions on your hospital?
Topic 8 (Closure)	Are there any other plans at your hospital for future changes that are relevant to our discussion?
	What would you have liked to have said more about or talked about in more detail?
	How did you feel about the conversation?
	What questions did you miss?
	Which ones were difficult to answer?

Table S2:
Interview guide: therapists

Topic 1 (Initial questions)	When did you finish your physio/ergo studies/training?
	How long have you been post-treating patients after primary total hip arthroplasties?
	What is the most common surgical approach for primary total hip arthroplasties in your clinic/practice?
	What is the dislocation rate for primary total hip arthroplasties in your clinic/practice? If yes, what was the reason for the dislocation?
Topic 2 (Hip precautions in general)	What is your personal opinion as a therapist about hip precautions after primary total hip arthroplasties?
	Is there any information from patients who say they are unaware of hip precautions?
	In your opinion, what is the general rationale for using hip precautions for primary total hip arthroplasties?
	How and what information do you receive from surgeons regarding hip precautions?
	Are instructions on hip precautions clearly communicated by hip surgeons (e.g. to patients and therapists)?
	Do you have information that there are hip surgeons who do not require hip precautions after primary total hip arthroplasties?
Topic 3 (Effort)	How much time do you spend instructing hip precautions to a patient?
	What is the importance of hip precautions in your post-treatment regimen?
	Do you think they influence the length of stay?
Topic 4 (Costs)	What are the financial costs for assistive devices?
Topic 5 (Personal experiences)	What are the goals you pursue with your patients?
	Do you usually achieve these goals?
	In your experience, how do patients deal with hip precautions?
	What impact do hip precautions have on how patients feel?
	Do you think the hip precautions affect the range of motion or strength in patients postoperatively?
	Have you noticed any financial impact related to the hip precautions for the total hip arthroplasties? For example, cost of assistive devices, length of hospital stay, or cost of a caregiver?
	In your opinion, what is the argument for or against a general recommendation for hip dislocation prophylaxis?
	Could you imagine prescribing individualised hip precautions in the future? Why (not)?
	Do you think discontinuing hip precautions for total hip arthroplasties would affect therapy use? If so, in what way?
Topic 6 (Closure)	Are there any plans at your centre for future changes that are relevant to our discussion?
	What would you have liked to say more about or talk about in more detail?
	How did you feel about the conversation?
	What questions did you miss?
	Which ones were difficult to answer?