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Decision-making around removal of indwelling urinary catheters after pituitary surgery

Jeanne-Marie Nollen, Anja H Brunsveld-Reinders, Wilco C Peul and Wouter R van Furth

ABSTRACT

Background: Diabetes insipidus (DI) is a common complication following pituitary surgery, causing significant health issues if left untreated. As part of the diagnostic process, accurate urinary output monitoring via indwelling urinary catheters (IDUCs) is essential, despite risks such as urinary tract infections and hindered recovery. Research on IDUC removal after pituitary surgery remains scarce. **Aim:** To explore health professionals' perspectives on IDUC management following pituitary surgery. **Methods:** Employing a qualitative design, semi-structured interviews were conducted with 15 professionals in the neurosurgical ward of a Dutch academic hospital. **Findings:** Four themes emerged: Concerns about missing identifying DI, patient–nurse dynamics, workload management, and lack of shared decision making. **Conclusion:** The findings underscore the need to balance clinical needs with patient care efficiency. There is a need for evidence-based guidelines and a multidisciplinary approach to optimise IDUC management, given the importance of patient-centred care and shared decision-making.

Key words: Diabetes insipidus ■ Pituitary surgery ■ Urinary catheterisation ■ Urinary tract infections ■ Collaboration ■ Decision-making

Diabetes insipidus (DI) is a complication following pituitary gland surgery. Various definitions are used across studies, which means that reported rates vary, but a large systematic review (Fountas et al, 2024) found the rate following transsphenoidal pituitary

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surgery to be 17%. DI is caused by a shortage of the antidiuretic hormone and results in polyuria and compensatory polydipsia in the first 12–24 hours after surgery (Prete et al, 2017). If left untreated, DI can lead to hypovolaemia, dehydration and electrolyte imbalances, which subsequently can lead to multi-system organ failure (Ajlan et al, 2018). The diagnosis of DI is based on clinical and biochemical findings, with the first step in the diagnostic process being the presence of polyuria and polydipsia, which can be detected by monitoring fluid balances (Garrahy et al, 2019).

The use of continuous bladder drainage through indwelling urinary catheters (IDUCs) has become standard practice after pituitary surgery to ensure accurate monitoring of urinary output (Edate and Albanese, 2015). This method not only minimises the loss of urinary output but also enhances the accuracy of monitoring, allowing nurses to conduct precise measurements of urinary output (Schreckinger et al, 2013; Jain et al, 2015; Prajapati et al, 2018).

Despite their utility, IDUCs are associated with an increased incidence of urinary tract infections (UTIs), carrying a 3–7% chance of UTI for each additional day the catheter is retained (Gould et al, 2010). UTIs can prolong hospital stays, amplify morbidity and mortality rates, and incur significant additional costs (Thakker et al, 2018). In addition, IDUCs may hinder patient mobility and daily activities, impacting postoperative recovery (Saint et al, 2018).

Extensive research, especially within intensive care and emergency department settings, has highlighted the importance of early IDUC removal, ideally within 24 hours after surgery, to reduce infection risks and enhance patient recovery (Harrod et al, 2013; Fakihi et al, 2014; Sadeghi et al, 2019). Despite this, the specific challenges of IDUC removal after pituitary surgery – particularly in managing the increased risk of postoperative DI – have not been thoroughly researched. Given the complexity introduced by DI, the perspectives of health professionals are crucial for understanding postoperative care in this context.

Aims

This study aimed to explore the considerations and experiences of health professionals who are central in the decision-making

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Table 1. Interview topics
1. Opening question
How would you describe the postoperative phase after pituitary gland tumour surgery? ■ Care and specific points of attention ■ Medical file management*
2. Attitude
How do you view the timing of indwelling urinary catheters (IDUC) removal in pituitary patients? ■ Diabetes insipidus? ■ Patient comfort ■ Severity of illness ■ Fluid balance ■ Nurses' position ■ Guidelines ■ Policy made by physician ■ Ability to make decisions ■ Timing ■ Patient participation*
3. Self-efficacy
What role does your intuition play in the decision to remove an IDUC in pituitary patients? ■ Knowledge ■ Experience ■ Insight ■ Norms and values ■ Inner feelings*
4. Social norm
To what extent do the written and unwritten rules on the ward influence IDUC removal in pituitary patients? ■ Role of the protocol ■ Role of physician policy ■ Shared/individual decision-making ■ Being able to discuss rules with others ■ Integrity/adherence to work-related norms and values ■ Doubts about guideline/policy/decision ■ Experience in other workplaces*

*These points were added during the research process

process regarding IDUC management on the first postoperative day for patients undergoing pituitary gland tumour surgery.

Methods

Study design

This study used a qualitative design, conducting semi-structured interviews to explore the experiences and considerations of health professionals involved in postoperative care for pituitary patients.

Sample and setting

The research was conducted in a neurosurgical ward at a university hospital in The Netherlands. The researchers adopted purposive sampling to select participants, aiming for a rich diversity of perspectives. Out of 17 professionals approached, 15 participated. This group included one neurosurgeon, four neurosurgical residents, one physician assistant (PA), and nine nurses. A conscious choice was made to include a larger number of nurses compared with other health professionals, recognising their critical role in carrying out postoperative care.

Participants were selected based on their direct involvement in the care of pituitary patients, requiring a minimum of 3 months of experience in the neurosurgical department to ensure familiarity with the specificities of pituitary care. Exclusion criteria were designed to prevent potential bias, excluding any health professional who had closely collaborated with the primary researcher within the past 6 months or those in more temporary positions such as ‘flex pools’ or students.

Data collection

Data were collected through semi-structured interviews. The interview guide (Table 1) was structured around the Attitudes, Social influence, and Self-efficacy (ASE) model, augmented with expert knowledge (Sheeran et al, 2016). Initial insights were obtained from two pilot interviews – one with a resident and another with a nurse, both from different wards within the university hospital. Feedback from these sessions led to refinements to the interview guide, specifically to enhance questions on patient participation and to clarify the concept of intuition. Subsequent adjustments were made following input from the neurosurgeon and a nurse. Interviews were conducted face to face in Dutch and audio-recorded, scheduled between April 2019 and June 2020 based on participant availability, and lasted 30–60 minutes.

Data analysis

Thematic analysis was performed on the transcribed interviews (Braun et al, 2019). Two researchers independently engaged in a rigorous coding process, identifying initial codes, and subsequently organising them into themes and subthemes (Williams and Moser, 2019). An iterative approach was used in which data collection and analysis occurred simultaneously (Chapman et al, 2015). After conducting 15 interviews, data saturation was reached (Fusch and Ness 2015). Findings were summarised and shared with participants for validation. A detailed logbook documented each step of the research. ATLAS.ti software facilitated the organisation and analysis of data (Paulus and Lester, 2016). The analysis was performed in Dutch, and quotes were later translated into English by a native speaker.

Ethical considerations

All procedures complied with relevant laws and guidelines, approved by the hospital’s Medical Ethics Committee (approval number N19.015). Participant consent was obtained; confidentiality was ensured.

Findings

Participants’ demographics are presented in Table 2. Four themes emerged: Concerns about missing DI, patient–nurse dynamics, workload management, and lack of shared decision making. Each theme is divided into subthemes and quotations are included in the text.

Theme 1: Concerns about missing DI

Health professionals unanimously expressed concern over the potential for missing a diagnosis of DI if the IDUC were removed prematurely.

Table 2. Participant demographics (n=15)	
	n (%)
Sex	
Male	5 (33.3)
Female	10 (66.6)
Age, years – mean (SD)	
20–29	9 (60)
30–39	3 (20)
40–49	0 (0)
50–59	3 (20)
Profession – distribution	
Nurse	9 (60)
Resident	4 (27)
Physician assistant	1 (7)
Neurosurgeon	1 (7)
Work experience, years	
<1	3 (20)
1–5	6 (40)
6–10	4 (26.7)
>10	2 (13.3)

Monitoring accuracy

The physician assistant explained the reliance on IDUCs for precise monitoring, especially in uncertain cases of DI:

‘If I am not sure if the patient is going to develop diabetes insipidus, I would prefer to keep the catheter in place because I feel that it is beneficial for the accuracy of the fluid balance.’

Practical issues such as incontinence, misuse of bedpan or urinal, and the lack of a scale for weighing incontinence material were cited as barriers to effective fluid balance monitoring without an IDUC. Some nurses voiced that these challenges made non-IDUC monitoring infeasible.

IDUC necessity

The necessity of using IDUCs for fluid balance monitoring was debated. A neurosurgeon, one resident, and one nurse showed a preference for non-invasive monitoring methods. The neurosurgeon mentioned:

‘In the end, the patient needs to go home, and there they don’t have a catheter either and I think if the patient is compos mentis, he should be able to monitor his fluid balance in the hospital.’

This reflects a perception that, when mentally capable, the patient has the ability to manage without an IDUC. Despite recognising IDUCs as a risk factor for delirium, delirium itself

was considered by several participants as a valid reason for using IDUCs due to the potential loss of urinary output.

Theme 2: Patient–nurse dynamics

This theme highlights how patient-specific factors and nurse perceptions shape clinical actions.

Gender and clinical factors

All participants thought that clinical deterioration and a history of urinary tract abnormalities warrant cautious consideration regarding IDUC management. Gender differences and physical abilities were also important factors. One nurse explained:

‘Gender and physical ability play crucial roles. It’s particularly strenuous for heavy female patients who need to use a bedpan, making it a physically demanding task for both the patient and me.’

All nurses and the neurosurgeon agreed that gender differences significantly influence IDUC removal decisions, noting the ease with which male patients use a urinal compared with the challenges female patients encounter with bedpans.

Physical and psychological effects

Most nurses reported that the presence of an IDUC limits physical mobility and imposes a psychological burden, manifesting as shame or fear. Some nurses observed a tendency to delay IDUC removal in patients exhibiting anxiety about mobility. The neurosurgeon and some nurses viewed IDUC-caused discomfort as a reason for removal, despite the perception that medication can manage pain. One nurse stated:

‘If the patient says the catheter hurts, I can give him pain medication. If I feel that [it] is better to retain the IDUC to monitor DI, I insist on keeping it, given my expertise and experience.’

The neurosurgeon, one resident and most nurses considered the occasional 24-hour postoperative mobility restriction as a valid reason for delaying IDUC removal, attributing this to the patient’s inability to independently use the bathroom during that period.

Empathic care

Participants highlighted their perception that nurses, distinguished by their empathy, patience and nurturing nature, tended to place greater emphasis on patient comfort, which may lead to postponed IDUC removal.

Theme 3: Workload management

This theme reflects on how IDUCs, although facilitating patient care, also pose challenges related to workload management and adherence to protocols.

Improving efficiency

Nurses unanimously acknowledged the role of IDUCs in optimising their workload by facilitating strict adherence to fluid-balance monitoring schedules. One nurse vividly described the laborious task of managing patients without an IDUC:

‘Whenever a patient needs to urinate, it requires providing them with a urinal or bedpan and subsequently collecting it, which significantly increases my workload. Walking extensive distances becomes a daily routine. In contrast, having a catheter in place simplifies this process, as it only necessitates emptying it every three hours.’

Scheduling challenges

Nurses expressed concerns over the hospital protocol that mandates early morning IDUC removal, often leading to practical dilemmas. The prescribed timing for IDUC removal at 6am was highlighted as a point of disagreement, primarily due to the difficulties in co-ordinating with medical staff and the potential discomfort caused to patients. One nurse shared:

‘No, I won’t call the resident at 6:00 to ask if I can remove the catheter. In my experience, the resident is not happy with me if I wake him up for this. Then I just leave the catheter. I just postpone removal and the dayshift can fix it.’

This illustrates the reluctance to adhere to the set timing due to anticipated negative responses from medical colleagues.

To address the challenges associated with the 6am removal, alternative strategies such as late-night removal or flexible scheduling were considered. Yet, some nurses expressed doubts about the feasibility of changing established practices within their ward:

‘I am not sure if [it] is possible to change the time of removing the catheter. We don’t look at the protocol, we just do it how we have done it for years.’

Theme 4: Lack of shared decision-making

Participants expressed divergent views on who had the authority to decide on IDUC removal, influenced by their interpretation of professional roles and responsibilities.

Role clarity and autonomy

Nurses displayed confidence in their judgment regarding IDUC management, valuing their autonomy within the collaborative care team. One nurse explained this balance:

‘I think I have enough experience to make the decision to remove a catheter on my own, without discussing with a resident first.’

Contrastingly, medical staff, including the neurosurgeon, advocated for a hierarchical decision process, emphasising their ultimate responsibility:

‘The resident can decide, of course. I think it is up to the medical staff to decide if the catheter can be removed since we are ultimately responsible for the patient.’

The division of roles brings to light the central issue of decision-making authority, as underscored by a resident’s observation:

‘I feel that nurses are the link between residents and patients. The residents will never actually remove a catheter so if we ask them [the nurses] to remove it and they don’t do it, maybe that is a sign that we should try to understand their reasons not to do so more ... because now I don’t understand it.’

Conflict and collaboration

Divergent perspectives often lead to conflict, especially when the patient’s discharge is at stake. The comment from a resident illustrates this:

‘In some cases, I experience it [nurses not obeying the orders of residents] as a hindering factor on the speed of discharging patients. Sometimes, nurses just do whatever they want, without looking at the bigger picture. If the catheter is removed one day later than what could have been possible, it can take longer before the patient can go home.’

Nurses, on their part, wanted residents to have more consideration regarding practicalities and patient readiness:

‘Sometimes a resident orders me to remove the catheter without asking me if the patient is ready for it or if the timing is convenient for me. I feel like the resident does not always think about the consequences for the patient and the nurse if a patient, for example, is tired or has bedrest.’

Shared decision-making

Opinions varied on the extent to which decisions about IDUC removal should be collaborative. Although some nurses advocated for increased patient involvement – ‘IDUC removal should be a joint decision between residents, nurses, and patients’ – some other nurses and residents preferred a more controlled approach by health professionals:

‘I prefer having control over the situation, as overly involving patients in the decision-making process may not be beneficial. Patients should have the opportunity to focus on being patients, concentrating on their recovery.’

There is a consensus on the value of interdisciplinary discussions for facilitating timely removal decisions.

Discussion

This study explored health professionals’ considerations in deciding to remove or retain IDUCs following pituitary tumour surgery, revealing decision-making processes shaped by concerns over diagnosing DI, patient characteristics, workload implication, and decision-making authority. These findings deepen our understanding of postoperative IDUC management, highlighting the balance between clinical judgement and practical considerations in a complex healthcare environment.

Concerns over accurately monitoring DI and ensuring patient safety prevailed, emphasising the vital role of IDUCs. This is aligned with Almalki et al (2021) and Prete et al (2017), who underscored the importance of precise monitoring in the

KEY POINTS

- Catheters, vital for fluid balance, pose infection risks and limit patient mobility, requiring a balanced approach to care
- Factors affecting catheter management post-pituitary surgery include diagnosing diabetes insipidus and workload
- Debate exists over who has the authority to decide on catheter removal, underlining the necessity for defined roles and nurse-led protocols
- Emphasis on patient-centred care suggests the need to educate patients on catheter risks and fostering shared decision-making

immediate postoperative period. The findings here suggest a need for clear, evidence-based guidelines that can support health professionals in making informed decisions about IDUC removal, potentially reducing the reliance on IDUCs for DI monitoring.

Divergent views on the authority for IDUC removal underscored a broader issue of role clarification within postoperative care teams, echoing the observations by Niederhauser et al (2020) on the overlap in perceived responsibilities. Implementing a nurse-driven protocol, as proposed by Arentzen (2011) and Tyson et al (2020), could streamline this process, enhancing collaboration and improving patient outcomes.

The study underscored the significance of IDUCs in enhancing nursing efficiency, reflecting the findings of Krein et al (2013). It is crucial, however, to balance these operational advantages with the wellbeing of patients, particularly considering the risks of UTI highlighted by Thakker et al (2018). Thus, optimising postoperative care involves a comprehensive approach that prioritises equally both nursing workflow and patient safety.

The findings of the present study reveal a gap in patient involvement in IDUC removal decisions, underscoring the need for more patient-centred care practices. Enhancing patient education on the risks and alternatives to IDUCs, as suggested by Safdar et al (2016), could empower patients and foster shared decision-making, in line with Coronado-Vázquez et al (2020)'s recommendations for decision-making aids.

Several issues associated with the 6am removal time, which resulted in postponed removal, became apparent. Existing literature offers no definitive guidance on the optimal timing for IDUC removal. Research slightly favours removal late at night rather than early in the morning, but evidence remains limited (Ellahi et al, 2021). Despite this lack of consensus, a common recommendation is to remove the IDUC as soon as possible after the operation (Nollen et al, 2023).

Strengths and limitations

This study's interdisciplinary approach allowed for an examination of IDUC management following pituitary surgery, enhancing the depth and quality of insights despite its nurse-centric subject. A code-recode analysis by two researchers ensured thorough data evaluation. The study's narrow focus on a specific patient group and single hospital ward limits its generalisability, yet the

findings offer valuable insights into specialised postoperative care dynamics.

Further research

Research should aim to find the optimal timing for IDUC removal using predictive modelling based on variables like surgery time, tumour type, and patient mobility, considering interdisciplinary input and patient care impact.

Conclusion

This research sheds light on the complex decision-making processes of health professionals regarding the retention or removal of IDUCs following pituitary surgery. With the findings highlighting the critical importance of accurate monitoring for DI and efficient postoperative care, the authors would advocate for clear, evidence-based guidelines to support these critical decisions. The findings emphasise the necessity of role clarification within care teams and the promotion of patient-centred approaches through enhanced education and shared decision-making. The authors would encourage interdisciplinary efforts to optimise care protocols and identify best practices for IDUC management. **BJN**

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CPD reflective questions

- How can health professionals balance the clinical necessity of indwelling urinary catheters (IDUCs) for fluid-balance monitoring with the risks associated with prolonged catheterisation, such as urinary tract infections and decreased patient mobility?
- In what ways can healthcare teams improve interdisciplinary communication and collaboration to ensure that decisions regarding IDUC management are made collectively?
- What strategies can be employed to enhance patient-centred care in the context of postoperative IDUC management, particularly in educating patients about the risks and alternatives to IDUCs, and involving them in decision-making?
- Reflect on your own practice. How can you contribute to optimising IDUC management protocols in your workplace to prevent potential complications and promote early recovery for surgical patients?

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