An exploration of the roles and perspectives of direct-care neurorehabilitation nurses on the process and actions of visual observation and safety monitoring for high risk brain injury patients

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Abstract

Aim This study aimed to produce preliminary evidence to inform the development of a framework for a consistent approach to downgrading frequent visual observations (FVO) monitoring in acquired brain injury (ABI) patients.

Design A purposive sample of 12 neurorehabilitation nurses participated in a two-stage, mixed-method design that involved a modified nominal group technique (NGT) and focus groups.

Results An agreed-upon 15 factors, converged into four categories, were identified as important to decision-making for downgrading FVO and monitoring. The mean percentage agreement across all 15 factors was 41% (95% confidence interval = 36% to 46%), indicating, on average, that there was moderate agreement between nursing staff ratings. The qualitative analysis produced two main themes – dimensions of the decision-making process, and strategies to streamline decision-making.

Conclusion Any intervention to support decision-making must be adaptable enough to suit highly variable clinical situations, and flexible enough to accommodate a range of patient-relevant factors that affect decision-making. Further research in this specialised area of rehabilitation needs to allow for consistent rather than uniform risk assessments and review processes and supported clinical decision-making to assist nurses when determining if and when to downgrade a patient's FVO.

Introduction

Brain injuries constitute a health problem of increasing concern internationally (Headway, 2015). Acquired brain injury (ABI) is defined as any type of brain damage acquired after birth (Barker, Gibson, & Robinson, 2018). ABI encompasses both traumatic and non-traumatic type injuries, from causes such as motor vehicle accidents, stroke and hypoxia, which result in decreased cognitive, physical and emotional functioning (Australian Institute of Health and Welfare, 2014).

Rehabilitation after ABI is costly, accounting for approximately 6% of specialist disability service funding in Australia (Australian Institute of Health and Welfare, 2007). Injury-related changes can affect both an individual's recovery experience in inpatient brain injury rehabilitation, and day-to-day service delivery. For example, physical disabilities such as ataxia, uncoordinated gait or impaired balance have been shown to contribute to an increased risk of falls and a longer length of stay (LOS) (McKechnie, Pryor, & Fisher, 2017; Wong, Brooks, & Mansfield, 2016). Further, a limited ability to control emotions can lead to agitation and aggressive behaviour that may further extend LOS and reduce the likelihood of returning home, instead requiring alternative long-term care and accommodation (McNett, Sarver, & Wilczewski, 2012). These both directly contribute to higher costs of rehabilitation (McNett et al., 2012).

Clear decision-making and care coordination are important within the rehabilitation team to provide safe, high quality care on a daily basis. How nursing staff interact with other nurses and health professionals is integral to this safe, high quality care (Oldland, Botti, Hutchinson, & Redley, 2020). The preservation of nurses' decision-making is imperative in critically thought-out individual care plans. Further, the fluctuating nature of ABI patients' functional status often requires nurses to regularly modify how individual patients are nursed and monitored as well as how patient care decisions are made.

To ensure patient safety in brain-injured patients, registered nurses initiate and all nursing staff conduct additional monitoring if needed alongside standard observations such as vital signs. Enrolled nurses may initiate discussion with a registered nurse or above to downgrade before adjusting documentation. Monitoring options include wandering patient technology and beds with built-in exit alarm systems. Frequent visual observations (FVO) may also be initiated, which entails increased frequency of intentional rounding on a patient when not involved in therapy sessions. Depending on the reason for additional monitoring, FVO may

comprise of a visual check only, a physical check of positioning, or checking a bed alarm ensuring it continues to be activated. A 24-hour one-to-one nursing special may be allocated together with an implemented behaviour support plan as an alternative for individual patients if FVO are clinically assessed as unsuitable.

FVO on ABI patients with ongoing significant impairments is resource-intensive and clinically challenging. It can also become intrusive to patients who no longer need such close monitoring. Unfortunately, there is currently no evidence-based framework that objectively determines appropriate pathways to downgrade or cease (henceforth 'downgrade') FVO. In most cases, final decisions are made in conjunction with the clinical nurse consultant (CNC) or nurse unit manager (NUM) using a process that may involve a clinical chart review, multidisciplinary team discussion and problem-solving with the nursing team caring for such patients. Currently, there are no existing policies or clinical framework regarding FVO, and assessment is based on clinical knowledge and experience. The clinical decision for a nursing special requires the CNC or NUM to conduct a clinical review of other strategies, and assess the risk of harm to the patient or others before presenting this request to the nursing director for approval. These discussions are often raised by direct-care staff who have seen improvement in the patient's behaviour. However, nurses are often reluctant to make the decision to downgrade FVO, despite their high-level expertise, appropriate specific clinical experience and critical thinking skills within this nursing specialty area. Yet a risk-averse approach to high-risk patients whose status is improving results in unnecessary treatment burden for patients who no longer need this level of care. It also adds to staff workload and diverts already scarce resources.

Aims

This pilot study aimed to produce preliminary evidence to inform the development of a framework for a consistent approach to downgrading FVO as a patient's status improves in inpatient brain injury rehabilitation. First, we aimed to identify and rank the factors that nurses assess when determining if FVO should be downgraded for patients currently participating in a rehabilitation program in a brain injury setting. Second, we aimed to understand how nurses use these assessments to make confident clinical decisions to modify the visual observation routine for individual patients. The study also explored direct-care nurses' views regarding strategies and recommendations to support the decision-making process when downgrading FVO.

Methods

Design

This study used a mixed-method qualitative design. The first stage comprised a discussion forum using a nominal group technique (NGT), and stage 2 involved focus groups. The NGT method was chosen because it uses a structured face-to-face environment for experts to achieve consensus on how to resolve a difficult problem, and because it can produce justifiable and credible outcomes (Harvey & Holmes, 2012). With reference to previous studies using a modified NGT approach (Rankin et al., 2016; Rycroft-Malone, 2001), a modified NGT approach was developed to maximise participation in a practice setting where time for research activities competes with the fixed priority of direct patient care. The NGT was modified by extending the period of time taken to complete the process. Participants were involved in the standard silent generation of ideas and round robin session (Rankin et al., 2016), but the clarification, removal of duplication and grouping was completed out of session by an expert panel. The finalised list was then sent to each participant to vote and rank factors within a defined timeframe. The focus groups in stage 2 explored how registered nurses use the identified factors when considering whether to downgrade FVO and to identify potential ways to support appropriate decision-making.

Setting and participants

This pilot study was conducted in a specialist inpatient brain injury rehabilitation setting in a tertiary health service in Queensland. In this setting, intensive, time-limited rehabilitation is offered for patients with a brain injury sustained between the ages of 16 and 65 years. Ethical approval for the study was obtained from the Metro South Health Human Research Ethics Committee (HREC/2018/QMS/45702).

Participants were purposively sampled. Nurses were eligible if they filled a direct-care grade 5 position or higher (registered or clinical nurse) and had at least 12 months' experience in the specialty of brain injury rehabilitation nursing. Age and gender were not specific inclusion criteria, but a range of male and female, younger and older nurses was preferred for diversity. Nurses were invited to participate in the pilot study by receiving a participant information sheet via email outlining the study and their expected involvement. The study was promoted face-to-face, with a range of available dates to participate.

Data collection

Stage 1

De-identified standard demographic data were collected from each participant at the beginning of stage 1 to describe the sample. Face-to-face discussion groups were held using an NGT approach in order to identify the factors which participants considered when deciding whether to downgrade FVO. The collated factors were reviewed by three clinical rehabilitation experts (medical, neuropsychology and nursing) to remove duplicates and clarify wording. Factors were then classified into groups by clinical topic. The final list of factors was emailed to participants, asking them to rank the factors in order of importance with reference to a 5-point Likert-type scale, ranging from 'extremely important' to 'not very important'. In the clinical context, factors considered important for one patient may be considered not very important for another patient. Giving the upper and lower limits of the scale relative rather than absolute labels allowed flexibility to reflect the variability and idiosyncrasy of individual patients with a brain injury. Results from the ranking task would thus provide insight into consensus regarding the relative importance of these factors.

Stage 2

Focus group discussions were guided by a set of semi-structured questions (Box 1) to understand how nurses use the identified factors to make confident decisions about modifying a FVO plan of care, as well as to identify specific strategies that might support their decision-making. The focus groups were audio-recorded for transcription and thematic analysis.

Data analysis

Stage 1

Descriptive summaries are reported as count (percent).

Box 1. Semi-structured questions

Stage 2 data collection	
1	Do you have any general comments about what you see in these results?
2	What would prompt you to "talk it over" with other nurses before you make a decision?
3	Describe to me the process you go through in weighing up these key indicators.
4	Is there ever a problem with direct-care nurses being risk-averse? Is the onus ever too challenging for nurses?
5	Based on your specialty experience, what kind of strategies could improve practice or patients' rehab experience re downgrading or ceasing visual obs?
6	Is there anything else you would like to say about nurses' decision-making to downgrade or cease visual obs?

Responses recorded on the 5-point Likert scale were reduced to three rating categories due to limited ratings in some categories. This was achieved by combining 'extremely important' and 'somewhat important' into the new category 'important', and 'not very important' and 'somewhat unimportant' into the new category 'not very important'. The category 'neither' remained unchanged. The percentage of inter-rater agreement was calculated for each factor (Crewson, 2005), using the *irr* package (Landis & Koch, 1977) in R (version 3.5.1) through the RStudio environment (version 1.1.447). The *irr* package contains functions that calculate various coefficients of interrater reliability and agreement. The mean agreement was determined for the factors belonging to the four clinical groups – cognition, behaviour, psychiatric and physical – and the mean (and 95% confidence interval) for the agreement across all 15 factors. Agreement was interpreted as: 0–20% slight; 21–40% fair; 0.41–0.60% moderate; 61–80% substantial; and 81–100% almost perfect (Landis & Koch, 1977).

Stage 2

The focus group discussions were transcribed in a de-identified form for thematic analysis (Braun & Clarke, 2006). The transcripts were read by two investigators (LB and KG) who applied open coding. The codes were discussed and refined to produce a mutually agreed coding framework. The framework was applied to both transcripts to identify patterns and contrasts that provide insights into the study aims. Exemplar quotes were noted, and disparities were resolved through discussion.

Results

Demographics

Of the 15 eligible nurses, 12 (80%) agreed to participate in the study. Twelve participated in the face-to-face session; four of these were subsequently unable to complete the ranking due to being on leave. All participants had a bachelor's level of education. Clinical experience ranged from 1–>10 years, and 42% of participants held clinical nurse positions with role descriptions that included greater decision-making accountability and scope. Participants were mostly female, and half were aged 21–30 years, with 58% of the sample <40 years of age (Table 1). The majority of participants had developed their nursing career in the brain injury rehabilitation setting.

Stage 1: Consensus

A total of 51 factors were identified from three NGT sessions. The refined list included 15 factors which were sorted into four clinical groups. Eight participants were involved in stage 1; the findings are presented in Table 2.

Table 1. Demographic characteristics of pilot study participants (n=12)

Characteristics	
Age	
21–30 years	6 (50%)
31–50 years	4 (33%)
51–60 years	2 (17%)
Gender	
Female	10 (83%)
Male	2 (17%)
Highest nursing qualification	
Bachelor of Nursing	12 (100%)
Nursing classification	
Clinical nurse	5 (42%)
Registered nurse	7 (58%)
Years as nurse since registration	
1–3 years	5 (42%)
4–9 years	4 (33%)
>10 years	3 (25%)
Years in current setting	
1–3 years	4 (33%)
4–9 years	6 (50%)
>10 years	2 (17%)
Employment status*	
Working only part time	7 (58%)
Working only full-time	3 (33%)

*Employment status: Two staff did not complete the demographic form

The mean agreement of nurses' ratings across all 15 factors was 41% (95% confidence interval = 36–46%) which is considered a moderate level of agreement. The agreement of ratings for the four clinical groups of cognition, behaviour, psychiatric and physical was 42%, 44%, 48% and 36%, respectively. The level of agreement was considered moderate for cognition, behaviour, and psychiatric, and fair for physical.

Stage 2: Qualitative findings

Eight participants (67%) attended one of two focus groups. Two major themes emerged from the analysis – dimensions of the decision-making process, and strategies to streamline decision-making (Box 2). Evidence for the identified themes is presented next. Square brackets within quotations indicate minor editing for clarification. In the round brackets after each quotation is the focus group number then the participant code.

Theme 1: Dimensions of the decision-making process

The first major theme revealed four key aspects of decision-

Table 2. Stage 1 levels of agreement

Factors		Important (score 1–2)		Neither (score 3)		Not very important (score 4–5)	
		n	(%)	n	(%)	n	(%)
Cognition							
1	Post traumatic amnesia (PTA) emergence (traumatic brain injury only)/orientated to time, person, place	5	62.5	1	12.5	2	25
2	Showing increased insight/self-awareness into injury	6	75	1	12.5	1	12.5
3	Able to express basic wants and needs and obey commands	4	50	3	37.5	1	12.5
Behaviour							
4	Decrease in impulsive behaviour and inhibition	6	75	0	0	2	25
5	Reduced physical frustration (harm to self or others) as shown on Pittsburgh Agitation Score	5	62.5	1	12.5	2	25
6	Reduced verbal frustration as shown on Pittsburgh Agitation Score	2	25	5	62.5	1	12.5
7	Decreased absconding risk (less than three documented episodes of attempted absconding)	5	71.4	0	0	2	28.6
8	Decrease use of pro re nata medications for behaviour management/optimised medication use	3	37.5	5	62.5	0	0
Psychiatric							
9	Stabilisation of psychotic features (for example decrease in episodes of hallucinations)	5	62.5	1	12.5	2	25
10	No documented acute suicidal or self-harm (in conjunction with Mental Health Services)	6	75	0	0	2	25
Physical							
11	Improved mobility (able to mobilise safely without increased risk of falling)	5	62.5	0	0	3	37.5
12	Continence plan in place to improve physical impulsiveness due to toileting	5	62.5	1	12.5	2	25
13	Able to physically use buzzer to get assistance	4	50	2	25	2	25
14	Improved sleep wake cycle/sleep hygiene plan in place	3	37.5	3	37.5	2	25
15	Medically stable	5	62.5	1	12.5	2	25

making, each distinct yet linked together in the complex clinical process of downgrading visual observations.

Theme 1.1 Collaborative decision-making

The first aspect of the decision-making process involved the core work of regular communication between nurses around core priorities used to build a risk matrix. This gathering and sharing of information provided a basis for reviewing a patient's current regimen:

We communicate pretty effectively amongst each other... throughout the shift, but there's no clear procedure or policy in regards to how we do that (1:P3).

The absence of a routinised approach to reviewing was important. It highlights the tailored nature of this task, "because it is a brain injury, and it is so unpredictable" (2:P1), and "everybody reacts

to brain trauma differently" (2:P2). Apparent discrepancies occurred due to clinical variability over time and relational variability between a patient and different nurses. For example:

Somebody might think the sight checks being ceased is appropriate, whereas another nurse would [say], "No, actually with me they try and get out of bed without my help; they won't ask for assistance" (2:P2).

Box 2. Thematic framework

1	Dimensions of the decision-making process
1.1	Collaborative decision-making
1.2	Individual decision-making
1.3	Confidence in decision-making
1.4	Challenges in decision-making
2	Strategies to streamline decision-making
2.1	Structure of a decision-making tool
2.2	Process of using a decision-making tool

Theme 1.2 Individual critical thinking

This aspect of the decision-making process is core to in-the-moment nursing. In a practice context of accountability and high stakes, nurses balanced conformity with policy-driven procedures and the constant need for flexibility, because “it depends on the patient” (1:P5). Despite the appealing prospect of efficiency in a simple checklist, it would require “everything get[ting] ticked off, which is going to be a lot of things” (1:P1).

Theme 1.3 Confidence in decision-making

Being confident in decision-making was desirable but elusive, when even an experienced nurse could remain “unsure if I want to cease the obs or not” (2:P2). Thus, to streamline the task of reviewing, a checklist-oriented innovation would need to be seen to safeguard appropriate practice:

[E]ven though we've got all that knowledge there and I know all this, it's good to have something to back you up and go, it's this, this and this (2:P1).

Theme 1.4 Challenges in decision-making

Nurses worked with what was unsatisfactory in the current process, as well as seeking ways to improve the situation. The primary challenge was to minimise the potential negative impact on patients when observations may be unnecessarily frequent:

Some people get really annoyed by it, if you're constantly in there...doing what they don't like, which is looking at them and [asking] “Are you okay?” (1:P1).

A parallel challenge was nursing burden, when an unnecessarily frequent task generated unsustainable levels of nursing workload:

I think [we should] be more vigilant doing sight checks. So, if it's 15 [minutely], do 15 [minutely] (1:P5).

That's a bit of a problem... if you have two patients on 15-minute sight checks on the weekend, in room two, and then you have another two patients that are 15-minute sight checks in [another room] (1:P4).

It doesn't happen. You are just physically running. It's physically not possible (1:P2).

Another recurring nursing burden was concern over making a decision that might have adverse consequences:

If you downgrade somebody's visual obs, they're still at risk of something happening, and if something happens, you'd feel responsible. Naturally, every nurse has that feeling of guilt and feeling of responsibility if something was to happen (2:P2).

Unsurprisingly, minimising the potential negative impact on patients took precedence over minimising the potential negative impact on nurses, since “patient safety comes first, number one... if in doubt, you... do the sight checks” (1:P4), which perpetuated an untenable level of nursing burden.

Theme 2: Strategies to streamline decision-making

The second main theme comprised two key elements of streamlining decision-making in a specialist nursing setting – structure and process.

Theme 2.1 Structure of a decision-making tool

Participants noted nurses' desire for a guide that supported their own decision-making while reinforcing and visually sharing how they went about this task:

I think having a visible way that we're using our thought process, how we're thinking things through (2:P1).

An ideal decision-making tool could be displayed for general reference at a glance, prompting nurses regarding what they need to consider:

I would love there to be a really simple way that it's easily visualised that we can have as a poster, that's really colourful but simple, to help people make the decision... It doesn't even need to be a framework, just about visibility and making it easily known what the factors are (2:P1).

Along with practical visibility, participants indicated that such a tool would need to include all relevant information for this complex task, so the review will be complete yet achievable in a realistic timeframe:

It needs to be comprehensive, but also able to be quickly read and boxes to be ticked kind of thing. But it's definitely also patient-specific and I think making it a little bit more comprehensive than this might enable that as well (1:P3).

That would be pretty cool actually if you could change it. In the mornings where it's needed, 15-minute sight checks, and then the afternoon when they're just settling, it could just kick in and be like, actually, it's every 30 minutes (2:P2).

To guide decision-making in practice, a structured tool would holistically consider not only direct risks, but also prompt nurses to think critically about factors related to general health and wellbeing that might contribute indirectly to a patient's behaviour patterns. For example:

There's a lot of factors that we need to observe... doing sight checks is not just looking at safety, it's also looking at whether they're having enough sleep at night. Are they awake most of the night, or are they waking between early hours in the morning? Because that also affects their performance in the ward and their therapies (2:P3).

It was difficult to visualise a straightforward tool to meet complex, individualised and changing needs, since "whether we could standardise something... would be very difficult" (2:P1).

This highlighted the potential limitations of a new tool if its development were feasible. Exploring how a new decision-making support tool might be used in practice shed light on what it should comprise.

Theme 2.2 Process of using a decision-making tool

Exploring the potential use of the tool in clinical practice indicated its practical feasibility if complemented by procedures to safely incorporate its desirable features. A timely, consultative approach was key to nurses' decision-making, since:

Regardless of what we do develop, I think it will still need to be like a team... At least we wouldn't have to go around and ask multiple people. We could just go to the team leader and say, "Hi, I filled this out, will you accept this?" (1:P1).

Regular review of current monitoring regimens could resolve the problem of unnecessary additional work and the risk of missed documentation, as well as the problem of invading patients' privacy when FVO was not clinically indicated. For example:

Like with any of our other risk assessments, it needs to be something that's done regularly and if there's a change (2:P1).

If [four patients] do need the 15-minute sight check... that needs to be worked into the skill mix and how you allocate patients as well. So that's something we need to consider as well, which we don't look at currently (1:P3).

Discussion

This study explored the factors that are important to nurses when downgrading FVO of brain injured patients. Our results provide important preliminary evidence that can be used to inform future research on the development and evaluation of an intervention to support standardised nursing care in a clinical environment that is typically idiosyncratic. Previous research has reported on the development and evaluation of instruments to monitor

behaviours associated with a patient in a post-traumatic amnesic state (Amato, Resan, & Mion, 2012) including the value of considering patient and environmental factors (Nott, Chapparo, Heard, & Baguley, 2010). Others have identified FVO to monitor at-risk brain-injured patients as an alternative to mechanical or pharmacological restraint (Eastwood & Schechtman, 1999), but the effectiveness of this costly alternative is unproven in the management of elopement or assaults (Harding, 2010). The use of diversional therapies has also been studied as a strategy for providing increased observation of at-risk patients (Bailey, Amato, & Mouhlias, 2009). None of these papers discussed strategies for downgrading FVO.

The Constant Visual Observation Needs Assessment Scale (Levels of Risk and Supervision Rating Scale) was developed to assess the need for constant visual observations (Moessner et al., 2016). Despite the satisfactory internal consistency (Pearson's $r=0.85-0.88$) of the two subscales, they showed low false negative rates associated with moderate-to high false positive rates (Moessner et al., 2016). Further research would be required to assess its value in downgrading visual observations. There have also been efforts to establish guidelines for downgrading constant one-to-one care using a five-step process of decreasing intensity supported by regular team interaction until patient independence is achieved (Riedel & Shaw, 1997). Although these guidelines were informed by clinical expertise, they were not formally evaluated, which limits their utility. The current study on *frequent* observation complements previous literature which focuses on *constant* visual monitoring. The distinction is important, because constant monitoring only downgrades to frequent monitoring which will eventually also need to be downgraded when appropriate.

Similar to nurses' decision-making in acute medical-surgical settings (Nibbelink & Reed, 2019), our findings confirm that deciding whether to downgrade FVO in brain injury rehabilitation is a complex process. It is influenced by several considerations including – beginning with an understanding of the patient's status, informed by previous nursing experience, and strengthened by collaboration with colleagues. In the context of caring for at-risk ABI inpatients, decision-making should be a multi-level process involving multiple important factors. As in other inpatient settings, it is not surprising that, regardless of their experience, nurses are reluctant to make a decision that might inadvertently contribute to patient harm. The current study has progressed the task of addressing the decision to downgrade FVO by identifying the key factors that should be considered based on expert opinion.

Theme 1 highlights the tension-governed nature of deciding whether to downgrade the visual observations. Nurses rely on familiar routines that prove to be effective, safe and efficient. Conversely, in their care of brain-injured patients, a routinised approach seems to not quite fit the needs of a changing and often unpredictable situation. However, the participants were more than willing to explore potential interventions because they were familiar with the decision-making challenges that beset their day-to-day practice, and recognised innovation as an opportunity to resolve these challenges.

Theme 2 places decision-making into the clinical context by exploring its potential form and features, and by identifying how the system and its procedures could complement a decision-making tool and make it work in practice. Using a consistent tool in a team-oriented environment would provide a link between the individual and collaborative decision-making of Theme 1. Giving consideration to the whole patient's clinical status signifies nurses' efforts to establish a sound foundation for confident decision-making. The potential for innovation is driven by the need to resolve both patient and nursing burden, despite the challenges of trying to standardise a task that often seems idiosyncratic.

This study also explored experienced nurses' views regarding the implementation of an intervention for downgrading FVO that would improve clinical decision-making. The contextual challenges are to ensure that the intervention is efficient and practical while preserving patient safety. Participants' frequent reference to 'guidelines' suggests that the intervention should be conservative and versatile in order to make it both usable and comprehensive enough to suit different clinical situations. Careful planning is needed to minimise the impact of common organisational, social and professional barriers to change (Grol & Grimshaw, 2003). A recent review (Bueno, Saurin, Wachs, Kuchenbecker, & Braithwaite, 2019) reported intensive care clinicians' preference for a decision-making mechanism that incorporates design slack in parallel with diversity of perspectives. Design slack allows the earlier detection of a need for change which in turn allows a wider window to set up resources to manage such a change (Bueno et al., 2019). This applies to both the use of an intervention and embedding a new intervention into practice.

Limitations

The primary limitation of the current study was the sample size. This study was conducted with a small group of nurses

practising within one institution. The experiences and views of nurses working in other brain injury specialty units may be different, and therefore the findings may not be generalisable beyond the study site. The method used to calculate agreement between nurses' ratings does not account for agreement due to random allocation (or 'chance'), unlike other metrics such as Fleiss' kappa (Crewson, 2005). As such, the levels of agreement reported in the current study could be biased high.

Conclusions

New evidence brings change to clinical practice, and the brain injury rehabilitation setting changes as care is provided to patients who are more complex and dependent. In this context, clinical decision-making needs to be critically reassessed and structured to suit the needs of the patients and be flexible enough to suit a range of patient factors. Moderate agreement was reached on most factors to consider when downgrading FVO. This may reflect nurses' caution in brain injury rehabilitation which serves patients who are increasingly complex and dependent. In the practice setting, the will to simplify decision-making to reduce patient and nursing burden is restrained by the challenges of pursuing a standardised process for a situation that is clinically idiosyncratic, changeable and involves risk. This kind of change is consistent with the concept of design slack which supports the optimal implementation of a new intervention. Future research to refine the decision-making process should accommodate these considerations.

Conflict of interest

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