

A community resource

Contenance and brain injury:
Improving independence
and quality of life, and
reducing cost of care

Full Report:

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The Insurance Commission is the WA Government State insurer providing injury insurance to motorists and self-insurance to the Government. Its community engagement program aims to prevent or minimise the risk of injuries insured by the Insurance Commission and improve the rehabilitation and care outcomes for its clients.

Attendant care costs are significant for the Insurance Commission, particularly for those clients who are catastrophically injured in vehicle crashes. This research into assistive toileting technologies aimed to increase client independence, improve quality of life, and decrease care costs.

For more information on the Insurance Commission, please visit: www.icwa.wa.gov.au

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Introduction:

Continence and brain injury

This community resource contains information from a research project that aimed to decrease the cost of care, increase independence, and improve quality of life for clients with an acquired brain injury (ABI) receiving staged, community-based injury rehabilitation from Brightwater Care Group in Western Australia.

The project trialled devices to help with toileting for people with an ABI and continence difficulties currently receiving brain injury rehabilitation at two Brightwater sites. Practices in continence management were also investigated throughout the project.

More than 700,000 Australians are estimated to have an ABI [1]. This group of injuries includes all types of brain injury occurring after birth, including brain injury caused by traumatic events, such as motor vehicle accidents, as well as non-traumatic events, such as stroke and hypoxia. ABI can cause long-term disability and disrupt quality of life due to impaired cognitive, physical, emotional, and independent functioning [2]. ABI is also associated with a considerable burden on the healthcare budget.

Problems with continence are common in people with an ABI, and yet continence remains poorly assessed and significantly under-managed in this population. Adequately managing continence may not only improve rehabilitation outcomes and increase independence but significantly reduce the burden on the healthcare budget.

The International Continence Society (ICS) defines urinary incontinence as “the complaint of any involuntary leakage of urine” [3], and faecal incontinence has been defined as “any involuntary loss of faecal material” [4].

Many people with ABI depend on staff intervention—in some cases, from more than one staff member—to assist with toileting. This greatly increases the cost of care for people with an ABI and has implications for a person’s quality of life and independence in activities of daily living. There are few effective and cost-efficient strategies for continence management after ABI. Therefore, finding solutions to manage continence-related problems in this population are urgently needed.

This project had four primary objectives:

1. Investigate, review, and trial technology to support people to toilet more independently.
2. Identify opportunities for change in practice
(i.e., increase independence, decrease staff intervention).
3. Determine the change in quality of life for residents using assistive toileting technologies.
4. Provide a final report and recommendations to the Insurance Commission.

What we did — our method

The preliminary study was conducted by Brightwater Care Group, based in Perth, Western Australia, and used a mixed-methods approach to investigate the use of assistive devices for people with an acquired brain injury (ABI) and continence and/or toileting difficulties receiving community-based brain injury rehabilitation.

Where we conducted the study

Brightwater provides staged community-based brain injury rehabilitation for people aged 18–65 years living with an ABI in Perth. Admissions are accepted at any time after injury, and rehabilitation takes place either at a community-based residential facility or offsite in the person's home.

The current study was conducted at two Brightwater brain injury rehabilitation sites: Oats Street and Marangaroo. The purpose-built Oats Street facility has 43 residential beds in eight small group houses (4–6 clients per house), plus eight independent living units, and provides support for 15 clients living in their home environment. The facility is designed so that all stages of rehabilitation after hospital can occur at the one site, ranging from stage 1 (full assistance and 24-hour care) to stage 10 (full independence). The residence support embodies this staged approach to rehabilitation, with each providing different levels of assistance to appropriately support clients' physical, sensory and care needs, and to facilitate progressively greater levels of independence. On admission, clients are assigned to the most appropriate residence according to their stage and move through residences as they progress towards independence.

Marangaroo offers two rehabilitation programs for clients with ABI and varying levels of care needs who are transitioning to appropriate and sustainable long-term accommodation options. Brightwater provides support to clients and their families to source and transition to this accommodation.

The Insurance Commission provides funding for the care of some clients receiving rehabilitation services from Brightwater.

Who was involved

Participants were 16 clients with an ABI and continence/toileting difficulties enrolled in the Brightwater community rehabilitation service. To be eligible, clients had to have an ABI of any cause and continence and/or toileting difficulties. ABIs include all types of brain injury both traumatic (eg. vehicle crash) and non-traumatic (eg. stroke or hypoxia). In addition to clients, 24 allied health, nursing, and disability support staff who were directly involved in the clinical care of clients at the two sites were surveyed about their knowledge around continence and disability. Observations by researchers were also included.

Intervention: what did we do?

The intervention had three parts:

1. Continence assessment.
2. Developing and implementing continence management plans.
3. Trialling assistive devices.

1. Continence assessment

All participants had a continence assessment prior to selecting and trialling assistive devices, using a continence assessment form created for this project. The form was developed by reviewing existing tools, the findings of empirical research, and current best practice guidelines.

Continence assessments comprised:

1. **General factors:** cognitive and communicative capacity; impact on quality of life symptoms; brief history of previous investigations, treatments, and management strategies; current use of any consumable products (e.g. continence pads) and/or assistive devices.
2. **Clinical symptoms:** bladder and bowel frequency, timing, and volume; circumstances of voiding and emptying the bowel; any complaints, signs, and symptoms of urinary and faecal incontinence.
3. **Non-specific contributing factors:** medical and surgical history, obstetric/gynaecological history, sexual symptoms, general information (e.g., exercise, sleep patterns, stress and relaxation, and medication), physical conditions (e.g., skin conditions, urogenital inspections), mobility and current medications.

Clinical interviews were conducted with each client to complete continence assessments, with each client's care team consulted to determine the accuracy of the information obtained. Other clinical documentation—e.g. progress notes, admission and discharge documents, previously completed outcome measures, bowel charts, team emails, and care plans—was reviewed to ensure a comprehensive understanding of each client's continence difficulties.

2. Continence management

Continence assessment outcomes were used to tailor management of each client's individual needs and preferences. Continence management plans included the following new and ongoing strategies and information:

1. Level of assistance and number of staff required to support toileting: e.g., independent, supervision, prompting, reminding, directional support.
2. Client's preferences for continence care during the day and night.
3. Toileting program: e.g., prompted routine with staff assistance, including toilet position for bladder and bowel.
4. Pad check/change program, including the number and size of pads.
5. Mobility devices for toileting: e.g., walking frame, hoist.
6. Other assistive devices for toileting: e.g. cognitive, vision, positioning, and daily living devices.
7. Pain management techniques.
8. Sleep management: e.g., night light, positioning devices.
9. Fluid intake and dietary changes.
10. Laxatives, suppositories, and aperients (type, dosage).
11. Other treatment options: e.g., medication, bladder training, electrical stimulation, pelvic floor muscle training.

The research team collaborated with appropriate clinical staff members to ensure that management plans were implemented and to provide clinical staff with recommendations for continued care to encourage ongoing best practice after the study had ended.

3. Assistive devices trial

The selection of assistive devices to trial for each client was determined by the outcomes of the continence assessment. Clients, their families, and staff were consulted to ensure a client-centred and multidisciplinary approach was adopted throughout the trial.

For this project, the cost and complexity of devices ranged from inexpensive and low-technology devices (e.g., bottom wipers) to costly and high-technology devices (e.g., bidets). Table 1 summarises the key assistive devices planned for trial during the study.

Consumable items, such as pads and disposable bed protectors, were included as part of standard management routines as required. However, these items were not classified as assistive devices, as they do not increase client independence or typically reduce the need for staff or carer intervention; for example, a staff member is often still required to change the continence pad.

Clients were educated on how to use their allocated assistive devices, and step-by-step user instructions were placed in client bedrooms. Education was provided to nursing, allied health, and disability support staff. Staff members were notified as to which clients were using new assistive devices via email, the site communication book, and during daily handover. Researchers were also present at clinical meetings to inform the team of these new devices.

Table 1. Assistive devices

Device	
Wristwatch	Wristwatches were trialled with clients with cognitive deficits who required a regular and prompted toileting regime. A “toilet” alarm was programmed on the wristwatch for waking hours. Alarms were set at three or four hourly intervals according to the client’s toileting regime.
Bidets	Bidets were considered for clients who required physical assistance to maintain perineal hygiene. These two clients had an appropriate level of balance and dexterity to use the bidet effectively. Unfortunately, Brightwater was unable to install the selected bidets due to legislative issues affecting plumbing requirements for installation.
Long-handled bottom wiper	Long-handled wipers were trialled for clients who experienced difficulties managing perineal hygiene due to a reduced range of movement or reduced balance.
Visual aids	A visual aid was trialled for client with a significantly reduced visual field as a result of his ABI. The client preferred to stand while urinating but had difficulty seeing the white toilet bowl against the white wall due to a lack of colour contrast. Placing an orange ping pong ball in the toilet bowl provided a colour contrast within the toilet bowl to help with aim while urinating.
Non-spill bottle	Non-spill bottles were provided to male clients who experience urgency, or have difficulties reaching the toilet in a short period, particularly overnight.

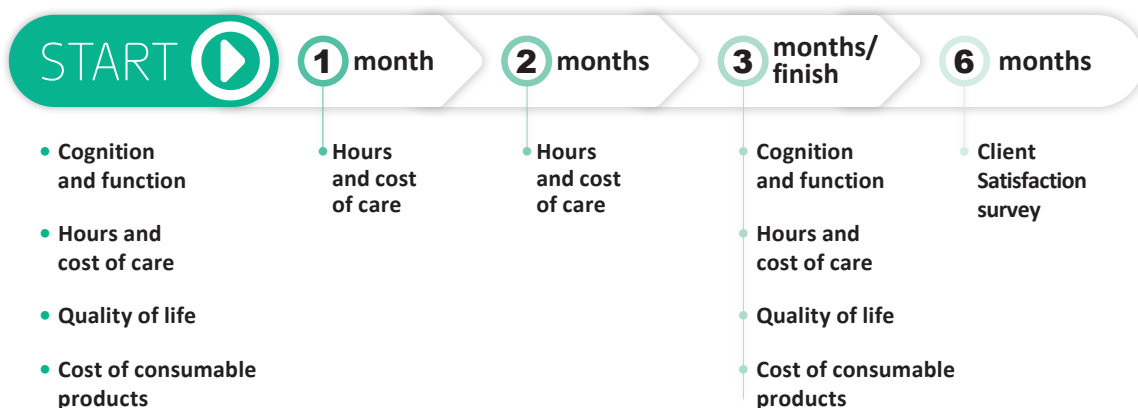
How we measured change

To measure changes over the three-month intervention in this study, we collected the following information at different times.

1. Demographic and diagnostic data.
2. Mental cognition and physical function (using the UK Functional Independence Measure + Functional Assessment Measure, known as FIM + FAM) [5].
3. Cost of care and hours of care required (using the Northwick Park Care Needs Assessment or NPCNA) [6,7].
4. Quality of life after brain injury (QOLIBRI) [8].
5. Cost of consumable products per client.
6. Client satisfaction survey.

Figure 1 provides a summary of each of the data collection times, including tools and measures collected at each time point. Clients continued to use assistive devices implemented as part of the trial after completion of the study period, if required and if they were satisfied with the device.

Figure 1. Timeline of the study intervention



Current staff and organisational practices in continence care were examined using two methods:

1. Qualitative observation; and
2. Staff surveys.

Qualitative observation: The clinical research team kept and updated a daily electronic written record from the beginning to the end of the study. This record included additional client and staff reports, site policy and procedural information, and other internal and external factors that impacted the project method. Preliminary observations using this method led to a staff survey being created to formally assess staff members' knowledge of continence and current practices in continence management.

Staff Surveys: Three staff surveys were developed to assess staff members' knowledge of continence, in addition to knowledge of and actual on-site assessment and management practices. The surveys were for allied health staff, nursing staff and disability support workers, with each survey developed to reflect different levels of knowledge and involvement with continence management.

What we found — our results

The change in function and cognition, cost and hours of care and consumables data were analysed for 14 clients for whom full data were available. For quality of life after brain injury data, analyses were undertaken for ten clients for whom full data were available.

Reduction in client dependency in toileting after intervention

The dependency of clients on staff decreased during the three-month intervention. This change was accounted for by a reduction in the level of staff assistance required to empty the bladder and bowels, with an observed reduction in bladder and bowel assistance on the NPCNA measure. There was no change in mean dependency scores for urinary and faecal incontinence over three months.

Reduction in care hours and cost of toileting assistance after intervention

Before intervention, the estimated average weekly care hours required for toileting were 15.3 hours per client at an average cost of \$7,249.86. After intervention, care hours for toileting decreased to an average of 11.0 hours per week at an average weekly cost of \$6,616.57. This represents a reduction in average care of approximately 4.3 hours per client per week and a weekly cost saving of approximately \$633.29.

Key findings for care needs and cost of care

- Prior to intervention, clients required an average of 15.3 hours of care per week at a cost of \$7,249.86.
- Three months after intervention, clients required an average of 11.0 hours of care, costing \$6,616.57.
- Average care hours required for continence and toileting decreased by approximately 4.3 hours per client per week three months after intervention, which translates to a cost reduction of approximately \$633.29 per client per week or \$33,000 per year.

Reduction in client dependency, required care hours, and cost of care for all care activities

Weekly care hours for all care activities (i.e., not only those for toileting/continence) at the beginning of the study averaged 44.4 care hours per week, at an average weekly cost of \$9,552.15. At the end of the study, weekly care hours decreased by 7.8 hours (M = 36.6 hours) and average weekly cost of care decreased by \$1,804.50 (M = \$7,747.65). On average, clients became more independent, required less care, and had reduced care costs after three additional months in Brightwater rehabilitation.

Reduction in the cost of consumable products to support continence

Studies typically indicate that the majority of direct costs of incontinence are attributable to routine care, including the cost of consumable products such as continence pads and protection [9,10]. The project estimated the cost of consumable products before and after intervention and found that clients required fewer consumable products for continence at a lower cost after intervention.

Key findings for consumable products

- Statistically significant reduction in the average cost of consumable products.
- Before intervention, the average daily cost of consumable products was \$26.01 (median: \$17.14) per client. After intervention, the average daily cost of consumable products was \$16.10 (median: \$8.11) per client.
- Average cost of consumables decreased by \$9.91 per client per day or \$3,614.80 per year.
- The median of \$8.11 per client is significantly less than a 2005 Australian study [11] finding of approximately \$15.84 per client for cost of consumables (figure adjusted for inflation).

Increased independence in cognitive and functional tasks

Clients became more independent in both physical and cognitive activities of daily living over the study period. There were statistically significant increases in cognition and function as assessed by the FIM+FAM outcome measure throughout the study.

Increased independence in toileting

There were statistically significant improvements in four of five items assessing client independence in toileting: toileting, bladder (level of assistance), bowel (level of assistance, frequency of accidents), and bowel (frequency of accidents), indicating that client independence in toileting improved significantly over the study period. Before the intervention, all scores indicated complete dependence on assistance (e.g., the client completes less than half of the task). Three months after implementing assistive devices, scores indicated that clients performed more than half of the tasks themselves.

Quality of life after intervention

ABI profoundly impacts quality of life, and this population reports a lower quality of life than pre-injury levels and comparison groups [12, 13]. Rehabilitation services for brain injury are increasingly adopting holistic models of rehabilitation; therefore, the impact of intervention and rehabilitation on quality of life is an important consideration.

Key findings for Quality of Life

- Contrary to expectations, clients reported lower global quality of life three months after intervention than at baseline, and across all six subscales.
- The decline in quality of life was greatest for feelings and physical problems, indicating that clients were more bothered by experiences such as loneliness, boredom, anxiety, pain, and slowness or clumsiness of movement.
- There is some evidence that quality of life decreases over time in the initial period after ABI as the person begins to come to terms with the consequences of injury [14].

The overall decline in quality of life could be impacted by several additional factors, including:

- longer length of stay in rehabilitation
- decline in health over the study period (some clients had hospital admissions)
- increased concern about own health due to the project focus
- social factors
- change in mental health status
- contact with the unfamiliar research team who asked personal questions
- less frequent staff interactions, which could increase feelings of boredom or loneliness
- other extraneous factors.

The underlying causes of this decline in quality of life need to be identified in order to plan appropriate and effective services and deliver high-quality care.

Intervention outcomes by brain injury diagnosis

This project suggests that clients with different brain injury diagnoses face unique challenges following brain injury – Stroke, Traumatic Brain Injury, and Hypoxia. The findings provide suggestive evidence that comprehensive assessment and tailored management, including assistive devices, can positively impact functional outcomes and costs for people with an ABI, irrespective of brain injury diagnosis.

Key findings by brain injury diagnosis

- Clients in all three diagnostic groups demonstrated gains after intervention.
- The stroke group showed a reduction in care needs and cost of consumable products, but a small increase (\$58.00) in cost of continence care. This was the result of two clients requiring increased medical intervention due to complications, which impacted their ability to toilet independently. The group became more independent in motor and cognitive domains. Stroke clients reported a decline in global quality of life, with the greatest decline reported for satisfaction with cognitive abilities and independence.
- The three clients with traumatic brain injury had reduced care needs, cost of care, and cost of consumable products after intervention. Total independence improved, with greater improvement in cognitive than motor function. In terms of quality of life, clients reported the greatest negative change in the domains of feelings and physical problems.
- The client with hypoxic brain injury demonstrated the greatest reduction in care needs, cost of care, and cost of consumable products of all dependency groups after intervention. The client became more independent in motor but not cognitive domains of independence. The client reported the greatest reduction in quality of life, particularly due to reduced satisfaction with social relationships and bother due to physical problems.

Table 2. Changes based on diagnosis

	Stroke	Traumatic Brain Injury	Hypoxia
Total weekly care hours	↓	↓	↓
Cost of care	●	↓	↓
Cost of consumable items	↓	↓	↓
Physical function	↑	↑	↑
Cognition	↑	↑	●
Quality of life after brain injury	↓	↓	↓

Key: ↓ = Decreasing ↑ = Increasing ● = Stays the same

Clients with stroke reported the greatest negative change in satisfaction with cognitive abilities, traumatic brain injury clients reported the greatest negative change in the domains of feelings, and the client with hypoxia reported the greatest decline in satisfaction with social relationships. Brain injury rehabilitation services are increasingly focused on the holistic impact of rehabilitation and thus, quality of life outcomes. To cater to the unique needs of clients with ABI, it is essential to understand potential vulnerabilities and to plan and deliver services accordingly.

Intervention outcomes by the initial level of dependency

This project demonstrated gains for clients in all three dependency groups after intervention with assistive devices, including functional improvement, reduction in care needs, and lower costs. Therefore, clients requiring all levels of care are likely to be positively impacted by interventions of this kind. ABI is a complex and dynamic disease process, and although many clients improved over the study period, several clients also experienced a worsening of condition, with some requiring hospital admissions. Therefore, further research is needed to confirm this potential focus.

Key findings by level of dependency at baseline

- Clients in all three dependency groups demonstrated gains after intervention, including functional improvement, care needs, and costs over the study period.
- Of all dependency groups, clients classified as medium dependency at baseline showed the greatest overall gains from intervention.
- The two low-dependency clients showed an increase in care needs and cost of care due to a decline in the health status of one client. The cost of consumables decreased. The clients made gains in cognitive and total independence, but not motor independence. These clients reported the greatest decline in quality of life of all diagnostic groups.
- The five medium-dependency clients demonstrated the greatest reduction in care needs, cost of care, and cost of consumable products of all dependency groups. These clients also showed the greatest improvement in independence and reported a relatively stable global quality of life.
- The stroke group showed a reduction in care needs and cost of consumable products, but there was a small increase in cost of continence care. Stroke clients became more independent in total, with motor and cognitive domains; however, they reported a decline in global quality of life, with the greatest decline for satisfaction with cognitive abilities and independence.

Table 3. Changes based on level of dependency

	Low Dependency	Medium Dependency	High Dependency
Total weekly care hours	●	↓	↓
Cost of care	●	↓	↓
Cost of consumable items	↓	↓	↓
Physical function	●	↑	↑
Cognition	↑	↑	↑
Quality of life after brain injury	↓	●	↓

Key: ↓ = Decreasing ↑ = Increasing ● = Stays the same

Client satisfaction with assistive devices

Of the 16 clients included in the project, seven clients were still receiving rehabilitation at a Brightwater site when the client satisfaction survey was administered. Four clients reported that they were not very satisfied or not at all satisfied with their allocated device. Three clients reported that they were more or less satisfied or very satisfied with their allocated device.

One client voiced that the device was no longer useful, given the improvement in their mobility, and another client reported difficulties with use. The varying levels of client satisfaction underscore the importance of a client-centred approach that involves regularly consulting clients to understand their potentially changing continence needs and preferences.

Following brain injury, many clients receiving specialist brain injury rehabilitation make significant functional gains, particularly in cognitive and motor capacity [15]. Given this considerable capacity for change in condition and thus continence status, it is critically important that continence management plans and assistive devices are regularly evaluated to ensure that they are in line with the client's changing needs and preferences as they progress in their rehabilitation.

Practice in continence management

The act of going to the toilet involves not only bladder and bowel actions, but also getting to and from the toilet, transferring onto and off the toilet, maintaining perineal hygiene, adjusting clothing, and practising adequate hand hygiene. The diverse conditions that may be associated with brain injury mean that consultation with all staff members involved in client care is critical to the management of continence-related difficulties in this vulnerable population. To meet a client's continence needs, preferences, and rehabilitation goals, it is critical that clients and their families are also involved in care decisions. To ensure that management is effective and efficient, strategies must be evidence based.

Clinical practice

Both observations of clinical practice, and responses from staff surveys, resulted in seven main findings around clinical practice.

Emphasis on client-centred care

Client-centred care is about viewing the person as an individual and incorporating the needs, values, and preferences of the person and their family into care decisions to optimise the person's experiences with care [16]. Participating clients reported that they needed more consultation by staff regarding their continence needs, preferences, and goals.

The importance of client-centred practice should be formalised in organisational policy. Additional evidence-based strategies to support client-centred practice include discussion of client care plans and early, open communication with clients and their families [17], increased direct one-on-one care time with the client and their family [18], and using pictures, videos and/or storyboards for information exchange with patients and family members to improve patient preparedness and consistency of patient care [19].

Coordination of continence care

Staff role clarity. Collaborative practice can improve resource efficiency and quality of care by improving the efficiency of multidisciplinary teams and reducing demands on staff [20-22]. However, sufficient role clarity is essential to achieve potential benefits [23]. A lack of role clarity can lead to underutilisation of professional expertise [23], which can compromise client outcomes and contribute to the inefficient use of resources [19]. Additional strategies include ongoing professional development that addresses optimising roles and clarity and facilitating a culture between professionals and other staff involved in care [24-26]. Therefore, the existing policy should be augmented to include guidance for different levels of staff around all responsibilities involved in continence management.

Reliance on a single continence champion. While the role of a continence champion may help to streamline continence requests, clinical practice guidelines recommend a multidisciplinary approach to continence management (e.g., NSF guidelines, 2017 [27]). A multidisciplinary approach may facilitate the delivery of a better care response and help to effectively manage the diversity of influences on continence status in people with an ABI (e.g., communicative and cognitive deficits, mobility, dietary intake).

Sufficient information regarding specialist consultation. Consultation with a continence specialist is one of the few recommendations with a sound evidence base [28]. It is essential that clients have access to specialist advice. The absence of clear guidance regarding specialist consultation has the potential to create staff uncertainty during care delivery, be an inefficient use of staff time and resources, and make consultation with a specialist less likely to occur. Staff should have access to clear procedural guidance for specialist consultation.

Standardised continence assessment protocols and procedure

To maximise the quality of care, the multidisciplinary team should adopt a shared language of assessment by implementing parameters for the use of different assessment tools and methods.

Comprehensive clinical documentation

Many healthcare services reporting suboptimal documentation of client and patient information, as well as an over-reliance on verbal information sharing (e.g., [29-31]).

Quality documentation is essential for good clinical communication and continuity of care. Appropriate and up-to-date documentation ensures that assessment, changes in conditions, care provided, and important client information are documented to support the multidisciplinary team and external agency staff members to deliver care [32]. Clinical documentation of client progress is also critical to assess the effectiveness of current intervention or management programs and adapt them accordingly. It is essential that efforts to improve clinical documentation are made.

Certainty about funding for continence products

Some clients were not currently on funding schemes for continence aids. This is especially true for clients who are not eligible for compensation from the Insurance Commission. In this case, the cost of continence products is covered by the organisation or the client themselves during on-site rehabilitation.

Consequently, there is uncertainty about how financial assistance will be provided for the purchase of products on discharge to the home. It is important that accessing funding is prioritised, both during on-site rehabilitation and at discharge.

Further staff education and training

There is demand for greater continence education and training from staff and site service managers. Educational interventions targeting staff have demonstrated positive impacts on staff knowledge and practice (e.g., Brady et al., 2015 [33]). Therefore, consideration should be given to providing all levels of staff with relevant education and training in client-centred continence care.

Staff collaboration

Good formal and informal communication is critical to client-centred, collaborative care [22]. However, client continence needs are often not discussed during team meetings or at handover. To promote collaboration in the area of continence, staff meetings should timetable discussions of client continence status, needs, and preferences. Open communication is also important in reviewing and adapting continence management plans as required, and feedback on status is significant in ensuring client needs are met.

Recommendations

The findings of this study indicate that intervention comprising a comprehensive continence assessment, individually tailored management, and assistive devices for people with acquired brain injury (ABI) will improve independence, both cognitively and physically.

Intervention can also reduce care hours and therefore cost. However, intervention did not positively impact client-reported quality of life.

Continence practice can also be improved to deliver client-centred and multidisciplinary care. The analysis consistently identified the importance of a client-centred and multidisciplinary approach to continence care. These findings have wide-ranging policy and practice implications, which should be taken into consideration when planning treatment and rehabilitation services.

Moving forward, it is recommended that the Insurance Commission, as the research funder:

1. Engage with providers servicing its clients with catastrophic injury and probable, uncertain, or complex incontinence, to ensure a comprehensive continence assessment is completed by a qualified continence specialist.
2. Consider how best to ensure future clients with catastrophic injury undergo early and regular comprehensive continence assessment.
3. Support industry-wide seminars/workshops on continence to improve sector-wide practice.

Sector-wide recommendations include:

1. Adopt a client-centred approach to continence care.
2. Review current policies and procedures against clinical practice guidelines.
3. Ensure standardised clinical documentation to enable the effective exchange of information between staff and to ensure continuity of care.
4. Improve continence management role clarity and understanding of roles.
5. Promote a multidisciplinary approach.
6. Increase staff education and training.
7. Support a multidisciplinary approach.

Recommendations for future research include:

1. Using larger samples of clients with ABI for replicability, generalisability, statistical significance, and effect sizes of findings from this study.
2. Replicating the study in an in-home setting and over longer periods.
3. Examining the possible causes of the decline in HRQOL.
4. Examining the lived experiences of persons with ABI and incontinence to foster a client-centred approach.

Further information

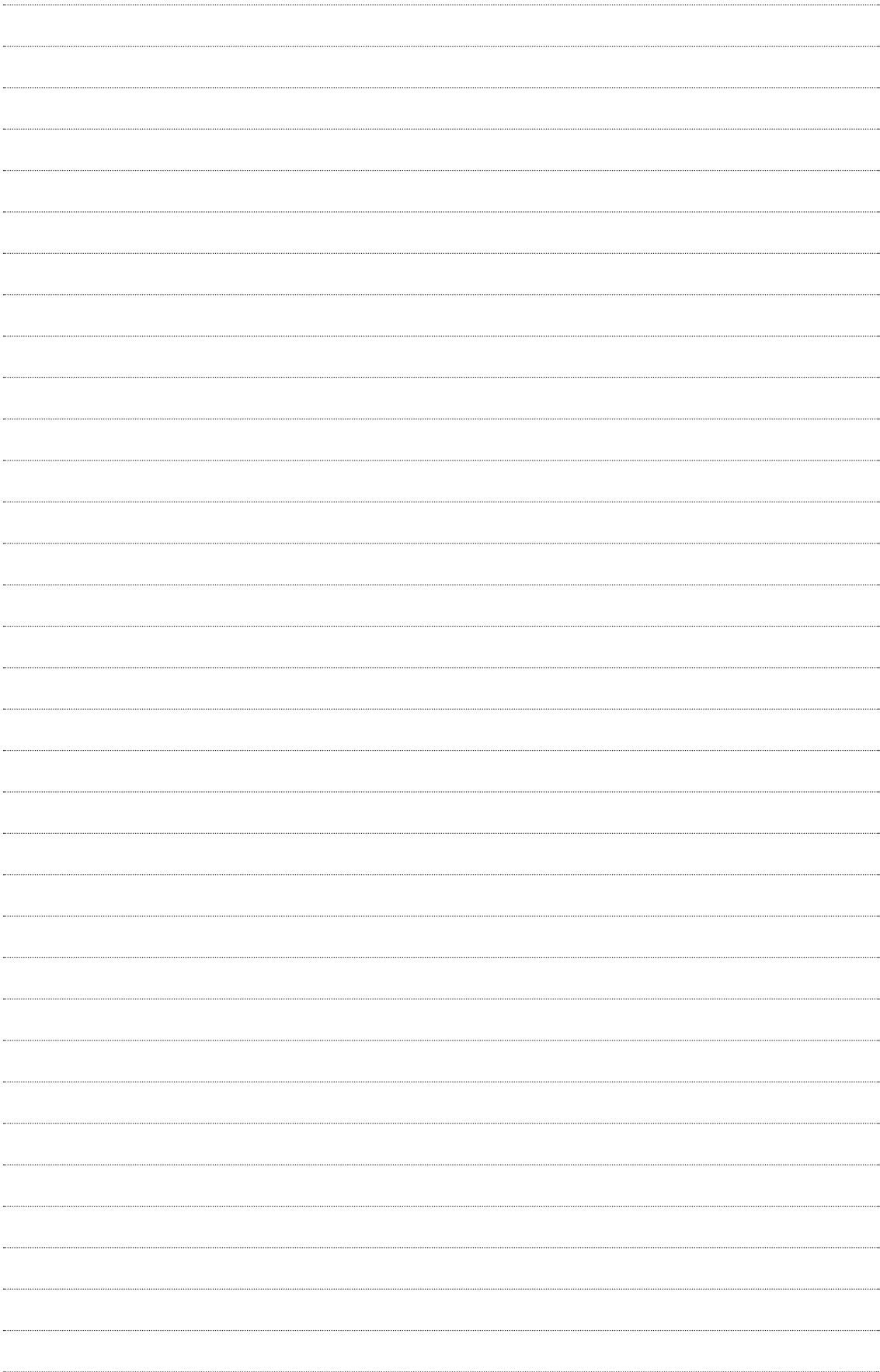
The full report and supporting clinical documentation are available to the public via the Insurance Commission, Brightwater, and Continence Foundation of WA websites.

The findings of the study were also communicated via a community workshop in Perth.

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