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Editorial

JARNA: a review of the past three years

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In this editorial, I reflect upon JARNA during my three years as editor. In that time, the purpose of JARNA has been clarified and nine issues produced. Central to this work has been a solid Editorial Board, all with masters or higher level qualifications and our publication partners, Cambridge Publishing.

To fulfill JARNA’s twofold purpose, namely to enhance the expanding knowledge base through the publication of information pertaining to rehabilitation nursing and to facilitate development of ARNA members as writers for publication, decisions about the type of content to be included have been ongoing throughout this time.

The introduction of a quarterly newsletter for ARNA members has enabled Chapter news and regular reports from the ARNA national president to be published in a more appropriate format and made space for additional scholarly content in JARNA. At this stage, the national president’s annual report will continue to be included in JARNA.

A wide range of articles has been received for consideration for publication in JARNA over the three years. Each has been reviewed by the editor and assigned to a category, which is now appearing at the top of the first page of each article in JARNA. The suite of categories is a work in progress and we are open to suggestions for new categories. There are three types of article that I am finding particularly interesting and, because I think they have potential for further development, I draw your attention to them in this editorial.

The first is the guest editorials. Initially, members of JARNA’s Editorial Board were invited to write these. Individuals posed their own topics and once agreed with the editor that the topic was of relevance, they progressed with the writing. Subsequent guest editorials have resulted from casual conversations. This edition’s guest editorial is a good example of this. It came about during a chance meeting with an ARNA member who recognised me when I was out for dinner. We chatted and before long my editor’s antennae were up; I was hearing a story that would make good content for JARNA. I made the suggestion and before long we had arranged a time to meet to discuss my suggestion. To my delight, at that meeting I was presented with a very publishable...
piece of writing and an ideal guest editorial. So, yes, clinical nurses can write for publication!

The second type of article I am finding particularly interesting is the letter to the editor. Unlike guest editorials, I am not actively soliciting these. While I do suggest to some people that what they are saying would make a good letter to the editor, I don’t chase them up as much as I do with other content. Mostly, letters to the editors just arrive and there has been a steady stream of them. While some letters are a response to published articles, others are about new topics. The letter in this edition provide examples of both. The letter from Sandra Lever contributes to the very important issue of bed utilisation in inpatient rehabilitation, raised by Brendan Bakes in 2014, and extends the discussion with new points for rehabilitation nurses to consider. They are points that I hear many clinicians talk about, but are seldom put down in writing. Sandra wants to stimulate discussion and exploration of matters arising in her everyday clinical practice. The potential I see in letters to the editor is for ARNA members (and others) to raise issues in a less demanding format than a full peer-reviewed article.

The third type of article, clinical commentary, is being launched in this edition. I have assigned this type to an article that includes relevant literature, but does not include a comprehensive review of the literature. The article is not about a quality initiative or a research project. Instead, it discusses key aspects of the everyday clinical practice of bladder scanning. Like guest editorials and letters to the editor, clinical commentaries have potential as a large proportion of ARNA members could contribute content of this type to JARNA. If you enjoy reading this type of content in JARNA, please consider putting pen to paper. In line with JARNA’s purpose of facilitating the development of ARNA members as writers for publication, help is only an email away. I take this part of my role as editor very seriously, so please do not hesitate to contact me if you want help putting your thoughts down on paper.

Reference

Letter to the Editor

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Dear Editor,

I read with great interest the guest editorial written by Brendan Bates in JARNA (2014), Vol. 17, No. 3, titled ‘Acute outliers in rehabilitation beds: Is a bed a bed?’.

In the article, Bates (2014) reminds us of the importance of acknowledging and understanding the values and limitations of our subacute beds. The article outlines some of the reasons for and consequences of outliers in rehabilitation units located within an acute hospital. Using the definition within the New South Wales Agency for Clinical Innovation Rehabilitation Implementation Toolkit (2013), Bates (2014) explains that a rehabilitation patient is someone who requires inpatient rehabilitation to achieve identified goals and is able to benefit and tolerate an intensive therapy program. As highlighted, the concern with placing acute medical and/or surgical patients (known as ‘outliers’) in rehabilitation beds, is related to the different nurse staffing models used for inpatient rehabilitation in comparison to acute units and the different knowledge and skill set that rehabilitation nurses have in comparison to nursing colleagues in acute units. Bates (2014) proceeds to highlight the risks to the patients, staff and organisation associated with outlying acute patients in rehabilitation units. Importantly, Bates (2014) urges rehabilitation nurses to speak up, to be involved in discussions about the type of patients transferred into inpatient rehabilitation beds and to advocate for the safety of their patients and colleagues.

Whilst I understand and agree with what Bates (2014) is saying about outliers, this editorial has me thinking about the changing nature of rehabilitation and raises a number of questions: Is the increased acuity within co-located inpatient rehabilitation units related only to outliers? What do we mean by “medical stability” within rehabilitation? And, is the specialty of rehabilitation nursing at risk of becoming non-existent within co-located inpatient rehabilitation services? I don’t propose to have the answers to these questions, but I am posing them here to generate discussion.

My current experience as a rehabilitation nurse within an inpatient rehabilitation unit located within an acute hospital has highlighted the increasing acuity of rehabilitation patients and the changing medical stability of these patients on a daily basis. But, these patients are not outliers, they are rehabilitation patients. I believe this increase in patient acuity and medical instability within inpatient rehabilitation settings is a reflection of our ageing society, improved technology, improved knowledge and skills in managing health conditions and earlier referral to rehabilitation from medical and surgical colleagues because their patients are at risk of deconditioning. Patients in hospital today are much sicker than they were even five years ago. Inpatient rehabilitation units are not the only ones seeing increased patient acuity. This ripple continues through into acute care settings and beyond – just ask our acute nursing colleagues about the changing acuity of patients in their acute care settings. I am wondering if this change in patient acuity means that the nature of rehabilitation is changing to be much more acute than in the past.

Bates (2014) noted that medical stability is generally required before admitting patients to a rehabilitation bed. This may generally be the case; however, it is not unusual for some patients within a co-located inpatient rehabilitation unit to become medically unstable during their time in rehabilitation. So what do we mean by “medical stability”? Merriam-Webster’s Medical Dictionary (2015) defines medical stability as “not changing or fluctuating”. Does this mean that if a patient’s medical condition has the potential to change or fluctuate, they should be excluded from inpatient rehabilitation?

Closely associated with increasing patient acuity and the question about patient medical instability is concern about the adequacy of inpatient rehabilitation nurse to patient ratios in light of the changing patient acuity in rehabilitation. There are similar concerns and risks here as those outlined by Bates (2014) with outliers. How do rehabilitation nurses juggle the acute needs of patients and the rehabilitative needs of other patients with lower nurse to patient ratios than acute care ratios? Something
has to give and, understandably, it is usually the rehabilitative needs of patients that become the lower priority. I believe that this places the specialty of rehabilitation nursing within inpatient rehabilitation units at risk. If nursing within co-located inpatient rehabilitation units becomes more like nursing in acute medical and surgical units, will these units become acute units with an allied health team conducting therapy rather than inpatient rehabilitation units with the benefit of specialty rehabilitation nurses? Rehabilitation nursing can maximise patient outcomes so what is required in co-located units is nurses with acute nursing skills and rehabilitation nursing skills.

Whilst rehabilitation is part of all nursing practice (Pryor, 2015) and in-reach rehabilitation to acute services (NSW ACI, 2015) will assist with these issues, it may be some time before we see in-reach services throughout the health care system. In the meantime, it is of great importance for rehabilitation nurses to be proactive in discussions about these matters and any other concerns with the potential to impact upon the welfare of their patients.

References
Guest editorial

Learning from the other side

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This is my story about a registered nurse learning about rehab from the other side and the story begins 10 years ago when I twisted my left knee while camping. The pain was sufficient that I visited an orthopaedic surgeon to see if I had done any real damage. He told me the good news was that there was only tendon damage but the bad news was that x-rays had shown wear and tear on both knees and that within 10 years he would need to give me two bright, shiny, new ones. In the meantime rest, support, and exercise would slow down the inevitable.

In the next five years I lost weight, joined a gym and kept up my busy lifestyle; I was going to prove him wrong! One month before a planned trip to Europe I again twisted my left knee and the physiotherapists advised that I see a surgeon as soon as possible. Back to see my friendly surgeon. This time he gave me the same message: tendonitis, it will settle but the x-rays showed a lack of cartilage in the left knee and not much more in the right. What did this mean for my future? Keep going and come back when the pain gets to where you can’t manage.

Now we get to January 2015 and the time had come, I even asked if he was still reading crystal balls as a hobby, considering how accurate his prediction had been. Surgery was planned for April and I set about getting all the information I could to be as ready as possible. I spoke to my bilateral knee replacement patients, I read the literature, I spoke to the rehab specialists, I even researched different pain management to see what was going to work best for me. I figured that eight weeks off work would be sufficient and work agreed. Everything was ready to go.

Postop went well. I walked on day one, as per the protocol. I showered with only set-up assistance on day three. Transfer to rehab day four. I was right on target. Then things started to get interesting.

As I said, I’d researched pain relief and decided to try Palexia. It was new and the idea that you did not need Pregabalin or similar as well suited me, I didn’t want to have any more medication than was necessary. I knew the importance of analgesia before the gym; I’m always reinforcing this to my patients, but now it took on a new meaning. I’m like all nurses, I’ve said I’ll get your Endone in a minute and never gone back, now that was happening to me. You cannot do your physiotherapy if you are in pain, I’ve said it to patients, and you know what, you can’t. I didn’t want to be that patient that nagged the staff for my pain relief but I had to sometimes; it really does make the difference between success and failure in the gym. The Palexia worked well and I didn’t have too many problems with iliotibial band pain but the most important part of my pain management turned out to be at times the most problematic.

Ice relieves the swelling and helps soothe sore muscles but it makes an awful mess in your bed when the ice pack leaks. In all the literature I had read before surgery ice packs are not mentioned anywhere, neither is the suggestion of having your own to bring with you. Now, some surgeons provide them as a matter of course, but if you have to send your partner, who is not particularly savvy about these things, out to get them, you will be using bags of ice for a while and the ice packs available in your local pharmacy are not quite what are needed.
My first days in the gym were agony. The physiotherapist was saying you need to do 10 straight leg raises. I told my legs we have to do 10 straight leg raises. My legs just stayed on the plinth. I didn’t know about having to re-engage muscles, not until someone said to me, “It’s okay, that’s normal”. Once I knew that I finally got things going. A little thing, but it made a huge difference to how I perceived my rehab was progressing.

The exercise program was what I expected with a morning session in the gym and hydro in the afternoon. The camaraderie in the gym groups was an important part of the process. Working in the private sector, patients are always asking for a private room, but they do not realise the importance of mixing with the other patients, comparing progress and having others around who understand what they are going through. Meal times in a dining room were filled with laughter and encouragement that staff would not necessarily understand. Exercise is an ongoing process that is not always well understood by the patient. This was one area I felt I had a better understanding of with my background. Many of my co-inmates felt that the two hours per day was insufficient for their recovery and were surprised to learn that everything throughout the day was part of therapy. At the same time, other patients and staff were quick to offer support and congratulations when someone achieved a goal.

After two weeks I was discharged from inpatient rehab out to the real world. The day before discharge, I begged my husband to take me out for a coffee at a local shopping centre. I was mobilising on two Canadian crutches, but this seemed to make me fair game for every trolley- or stroller-wheeling maniac. I even got told I was taking up more than my share of space in a crowded lift, after I had placed the crutches in front of my knees to protect them and the crutches were rammed with her trolley! This gave me a warning of what could happen so I stayed at home for the next three weeks, except for going to day rehab.

My first outing out was to see my friendly orthopod. At this meeting he finally told me the most useful information and I wished I’d heard it six weeks earlier. Once he had watched me walk into his rooms, he sat me down and said, “Before you say anything, I know:

- they still feel clunky
- they still feel hot
- they still feel swollen
- they still feel heavy
- they still feel stiff, especially in the mornings; have I missed anything?”

To which I answered, “So, it’s okay they don’t feel like they belong to me yet?” and he answered, “Exactly.”

He went on to explain that what I had done was not a quick fix but rather a long-term result and, as such, I could not expect to have perfection immediately. As well as having replaced very damaged joints with mechanical joints, I now had to replace a mindset and walking style that I had been very used to and this would take time. I could expect to start seeing differences from now on but the full effect could take up to 12 months and I needed to be patient.

The effect of this conversation was I started looking at my progress as progress rather than slight changes. I accepted that everything would not be better straight away. I looked at what I could now do instead of what I couldn’t and I realised that I was so much better off than before the operation.

Once I was able to adopt this mindset, I found returning to work relatively easy. I worked out a shift routine of work four days, off two days and found this manageable.

More importantly, I found my new insight helpful when speaking to other new joint replacements. I use the five points to explain what is happening to them and that it is normal. I remind them of the importance of pain relief being given in a timely fashion. I say to them to use ice and that it really will help. I encourage them to sit with their legs elevated to help with the swelling.

But the most important thing is I encourage them to see their progress. This goes for all joints and all ages. One of our most important jobs in rehab is to help a patient see that they are improving and if we can do this we are doing our job well. The encouragement I received from the staff, my family and the other patients helped make my recovery successful, and I hope I can do this for others as well.
Report to ARNA 2015 National AGM

The past year has been both a busy and challenging time for the Australian Rehabilitation Nurses’ Association. The year commenced with a successful conference held in Darwin, exploring *The Culture of Rehabilitation*. We experienced a wide variation of interesting presentations from our keynote speaker Melissa Noonan, and invited speakers Dr Lucy Madebwe and Mark Kilpatrick. The delegation also experienced some cultural entertainment from local groups One Mob Different Country and the Grey Panthers.

This year’s conference has come together well under the coordination of the conference coordinating committee with a call to *Getting Everyone on Board* in Brisbane. I take this opportunity to thank Shaun Matthews and the members of the conference organising committee for their efforts in planning this year’s conference with anticipation of its success.

In line with ARNA’s two-year conference scheduling, a venue for next year’s 26th annual conference has already been secured. This will allow an earlier call for and closing of abstract submissions and the sourcing of sponsorships. The venue for the 2016 conference will be announced at the end of this year’s conference.

The National Committee continued to meet monthly via teleconference and met face-to-face for the annual planning meeting on the weekend of 6th and 7th December 2014. During the weekend the committee reviewed the 2012–2015 Strategic Plan, and developed the 2015–2018 Strategic Plan. Education, Research, Member Services, Continuous Improvement, and, Leadership and Collaboration were included in discussions during the planning weekend.

One of the priorities set was to actively pursue the involvement of Western Australian members, especially with the holding of a study day in WA and the possibility of the formation of a WA Chapter. All chapters agreed to support the SAINTWA Chapter in making it happen. On 21st and 22nd August the first ever WA study days were held at the Fremantle Hospital, with around 60 delegates in attendance, including 19 local ARNA members, were presented with a wide variety of topics. Assistance from TRACS WA made the event become a successful reality. I was personally impressed by the standard of the event. I would like to acknowledge here that TRACS WA provided scholarships to four WA nurses to attend the 2014 Darwin conference.

Another initiative from the planning meeting discussions was the introduction of the ARNA national newsletter. The newsletter is a bimonthly publication with an aim of keeping the membership informed and up-to-date with what is happening at both the chapter and national level. Beverley Liebelt has taken on the initial role of Newsletter Editor. The newsletter is emailed to all members with an email address and is also available via the ARNA website.

At the 2014 AGM the membership voted in favour of adapting a revised constitution, which aligned ARNA with relevant legislative requirements. The 2012–2015 Strategic Plan, as reported above, was reviewed to align it with the new constitution, resulting in the development of the 2015–2018 Strategic Plan. The Strategic Plan is the fundamental document that informs our planning and the way ARNA works. ARNA’s reviewed
Vision sees “Rehabilitation as an integral part of every nurse’s practice” and our Mission now is to “Support the development and sharing of nursing’s body of rehabilitation knowledge, skills and attitudes for the wellbeing of individuals and communities”. Professionalism, Leadership, Accountability, Collaboration and Excellence remain as ARNA’s core values. There are now three pillars of strategic success: Governance, Education and Research, and Member Services. The committee believes that Leadership and Collaboration underpin these pillars of success, which is reflected within the reviewed Governance structure presented within the 2015–2018 Strategic Plan, and is available to the members via the ARNA website.

ARNA has continued to have representation on CoNNO (Coalition of National Nursing Organisations) and the Independent Hospital Pricing Authority (IHPA) Subacute Working Group throughout the past 12 months. Andrew Murray and Sara Alger represented ARNA at the CoNNO meetings while I have been the ARNA representative at IHPA Subacute Work Group meetings. This year scheduled meetings for IHPA were cancelled.

JARNA has continued to be produced through Cambridge Publishing for another three editions this last year. These editions have attracted advertising, which has resulted in some revenue for ARNA, which helps fund the cost of publication. JARNA has long been recognised as a venue for the sharing of information relevant to rehabilitation nursing, practice development activities and research with ARNA members and beyond resource. Members may have noticed some subtle changes to the JARNA layout within the current issue, with Chapter and National President Reports no longer appearing in this publication as they will now be presented within the newsletter. Thanks must be given to the contributors, Julie Pryor and the JARNA Editorial Board for its continual success.

In addition to the activities of the National Committee, much has been happening within the Chapters. A primary activity of Chapters is member education and networking, with a number of rehabilitation nursing study days been held. Chapters have reported good attendance numbers at these study days, attesting to ARNA’s reputation as a provider of relevant and high-quality education.

ARNA has experienced strong membership numbers over past years, with this continuing again over the past 12 months. Membership currently is around 531 and included in this figure are 135 new members. I would like to acknowledge here that three delegates who attended the WA study day in August joined during that event.

PAMS has continued as our administration service and throughout the past 12 months has continued to provide a high-quality service for ARNA. This includes answering phone enquiries, managing the website, financial accounting, minute taking of meetings, coordination of sponsorship for the conference, flyers and E-flashes, and general support to both the National Executive and the National Committee. Earlier this year, PAMS relocated their office from Surrey Hills to East Melbourne into more appropriate office space and managed to move with minimal disruption to ARNA. Victoria Robinson, who became our Association Manager prior to the 2014 Conference, has continued to be a valuable member of the ARNA team and I thank her for her support during the past 12 months and for her continual support over the months to come.

Recently ARNA was presented with an opportunity to participate within the review process of the draft version 2 of the NSQHS Standards and be recognised as an organisation that supports the ACSQHC (Australian Commission on Safety and Quality in Health Care) “Call for Action” campaign for better care for cognitive impairment in hospitals. The National Committee agreed to this and asked Deidre Widdall to coordinate ARNA’s response, and agreed to allow the use of the ARNA logo and “Advancing Rehabilitation in Nursing” on the ACSQHSC “Call for Action” campaign micro-website. A call for comment from the membership was circulated via an E-flash. The coordinated response is due by 30th October. Thanks to Deidre for taking on the responsibility of coordinating and formulating ARNA’s response and to the members who were able to comment.

In closing, my thanks and gratitude are extended to the members of the National Executive and the National Committee for their dedication, commitment and tireless work over the past 12 months. Thanks to Sara Alger for taking over the chair for the two meetings I was unable to attend and congratulations on achievement of three medals at the 2015 Masters Games. There is one other group that needs to be thanked for their support of the organisation, and that group is you, the members.
‘The rehab journey’: Developing a flash card resource to educate paediatric rehabilitation patients about aspects of their recovery – a designer’s perspective

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Abstract
Using visuals to communicate with young patients is an effective alternative to the complexity of verbal or written information. However, producing communication materials for paediatric rehabilitation patients is difficult. How can meaningful visuals be developed by clinical staff who do not have the required technical skills, or by designers who do not have the domain-specific knowledge or patient empathy required to produce holistic content? This paper posits that multidisciplinary collaboration offers a solution, with an emphasis on bringing together designers and health professionals. Within this team, the designer functions as visual expert and the health professional as patient advocate, thus enabling domain-specific information to be made visible by good design. By merging knowledge bases a holistic approach to patient education can be achieved.

Keywords: Clinical practice innovation, graphic design, health education, multidisciplinary collaboration, paediatric rehabilitation.

This paper describes a contemporary clinical collaboration in which the author (as designer) worked with a health professional to produce a flash card resource for children undergoing physical rehabilitation as a result of a brain injury or spinal cord injury. A literature review around health literacy, health communication and visual communication is presented, providing a lens through which the value of visuals as health communication aids can be interpreted. The design and evaluation process implemented in the collaboration is recounted, shedding light on how creative techniques can be utilised in clinical settings. The results of the collaboration suggest that embedding designers in health environments is positive in terms of improving the quality of patient-education materials and, therefore, is an approach that should be more widely considered by healthcare providers.

Embarassment and shame exist surrounding poor health literacy (Oates & Paasche-Orlow, 2009) and, for this reason, it often goes unrecognised by the healthcare provider as the patient actively attempts to conceal it. Without knowing a patient’s capabilities and limitations, it becomes extremely difficult to engage in patient-centred communication. The Institute of Medicine, American Medical Association, American College of Physicians, and the Joint Commission (as cited by Oates & Paasche-Orlow, 2009) have targeted health literacy as a priority area in need of improvement. The support of these high-profile organisations validates the need for studies into improving patient comprehension. Interestingly, the most prominent research and the most frequently cited English language definitions of health literacy originate from the United States of America. In Australia, health literacy has been highlighted by the federal government as a key issue for primary healthcare reform (Australian Government, 2009). However, it is given much less emphasis than the US call to action, presented as only one small element of an extensive list of areas for improvement. As well as health literacy skills, cultural and ethnic background, education level, language competencies, and age-related cognitive abilities may influence the comprehension of

Review of literature
There are several barriers to effective communication within clinical settings. Low health literacy is a significant problem contributing to poor levels of patient understanding. Low health literacy is the inability to read, comprehend and act appropriately on basic health information (Fleming, 2007).
presented information, especially if the message is primarily narrative (Terre, 2009). In addition to these factors, medical conditions themselves may manifest in symptoms that impact communication. For example, an acquired brain injury may affect a patient’s ability to speak and think (Rushworth, 2008), and this presents a communication challenge.

Health communication literature largely focuses on patient understanding, but it is also critical to examine the communication competencies of health professionals. While communication skills can be taught, every clinical situation is unique and responses are intuitive (Salmon & Young, 2011). A health professional with great technical skills can be a poor communicator and this can have negative effects on their success in clinical practice (Teutsch, 2003). When a health professional is too well versed in the intricacies of a subject, poor explanations can occur (Purtilo & Haddad, 2002). This is where standardised visuals, tailored to the audience, are particularly useful. In creating and evaluating these visuals we need to have both designer and health professional input.

The use of graphics is not a strategy generally accepted and adopted by health authorities (Dowse, 2004) yet it is known that humans have a preference for picture-based information (known as the “picture superiority effect”) (Dowse, 2004; Katz, Kripalani & Weiss, 2006; Lidwell, Holden & Butler, 2003). When compared to verbal inputs, visual information is more easily processed. Pictures have the benefit of expressing elements of reality as they are close to sensory reality and experience, whereas linguistic representations require transformation from abstract notation to visual representation to be understood. Jonathan Bignell (1997) distinguishes between written and visual language: “One of the distinctions between linguistic signs and other kinds of signs [pictorial or visual] is that language is always dependent on time”. Pictorial codes are read simultaneously, whilst the abstract, written codes have to be read sequentially, therefore taking longer. Graphics also have the ability to display visual order which can be unclear at a linguistic level (Barat, 2007). In addition, they can be used to communicate with clinical populations that do not respond well to verbal cues due to auditory impairment or deficits in information processing, attention or working memory (Ahmed & Boisvert, 2003). This highlights the notion that graphics are a more efficient and effective way to communicate with non-specialist audiences and audiences with varying perceptual and cognitive abilities. It is critical to note that, to date, design and designers have made little contribution to cognitive impairment information delivery. Empathising with cognitive impairment is difficult, if not impossible, for someone without first-hand experience (Pullin, 2009). This presents a strong need for collaboration with skilled health professionals in this area.

Research background

The contemporary clinical collaboration presented in this paper is one of three initiatives that were conducted as part of a doctoral study (the others were focused on asthma management and chronic functional constipation). Through an extensive literature review, problems around health professional–patient communication were identified, and a gap in the use of collaboratively designed health education materials to facilitate effective communication was apparent. The clinical collaboration was designed in such a way that the designer would work one-on-one with individuals identified through a clinical practice consultant network to explore the collaborative process. This was not a situation where the designer was hired to deliver a solution to a pre-determined problem. It was a case of the designer approaching the clinical practice consultant network with a proposal – to be part of a collaborative process where communication problems pertinent to the individual’s specific education practice are identified, and potential solutions developed together. The initiative was approved by the Women’s and Children’s Health Network Human Research Ethics Committee and the University of South Australia Human Research Ethics Committee, and the study conformed to the National Statement on Ethical Conduct in Research Involving Humans by the National Health and Medical Research Council of Australia (National Health and Medical Research Council, 2007).

The collaborative design process

The 3-Corner Collaborative Design Model (Paulovich, 2015), shown in Figure 1, is a new and unique multidisciplinary framework that I have developed for creating highly effective, audience-specific, patient education materials. Named 3-Corner in recognition of the three primary groups that interact with each other (health professionals, designers, patients), it is specifically informed by the Communication Research Institute Design Process Model developed by David Sless (2008). The following sections of this paper will explain how each stage of the design model unfolded during my collaboration with a paediatric rehabilitation health professional to produce a set of flash cards for patient education.

1. Information gathering

Information gathering refers to the process of acquiring and interpreting information relevant to the design task to inform the design brief. The design brief is a document that outlines the scope, aims and deliverables of the task, which is something that all parties need to agree on before design work is to commence (Phillips, 2004).

Information gathering consisted firstly of an informal preliminary meeting with the clinical practice consultant, during which we
discussed patient communication issues that arise in her work, as well as some initial design ideas. In this meeting it became apparent that input from other disciplines would be needed; therefore, we held a broader therapists meeting, during which I gathered insight into the role of each member of the health team and developed empathy for patients undergoing rehabilitation activities. All team members were invited to submit their ideas and recommendations to me via email after the meeting. Direct contact with patients was restricted due to the effects that the presence of an unfamiliar researcher can have on study setting and results (Allen, 2010), so it was critical that I engaged in as much patient experience conversation with the health team as possible in order to visualise and interpret the patient experience. Through team collaboration, the idea emerged that we need to be mindful not to create unrealistic expectations for recovery through the text and image content of the design. Each patient journey is different, so the design needed to allow for individual customisation.

2. Concept development

Concept development is a process of synthesising information into a wide variety of visual forms, which is often driven by intense periods of brainstorming, sketching and exploration of different approaches and techniques (Stone, 2010). In this case study I adopted a word association approach to brainstorming, as shown in Figure 2.
The idea that the device had to be customised for each patient drove the concept development process and became an extremely critical parameter that dictated the form of the design (flash cards) as shown in Figure 3. Two other concepts were developed (a traditional picture book and a tactile picture book), but were not selected for further development by the health professional, due to their inability to be customised.

The flash card concept was chosen and the health professional and I brainstormed additional scenes that needed to be depicted to show the complete rehabilitation journey. Her advice to me was “the best thing I would say for you … is to think about the worst [case] scenario” (Rehabilitation Clinical Practice Consultant, June 2013). To allow me to visualise this properly, I was taken on a tour of relevant areas of the hospital, including the wards, play room, kitchen, pool, gym and Starlight Express Room. I observed patients attending school and participating in a disco with Captain Starlight. I noted the layout and colour scheme of the kitchen and I sketched the physical form of the specialised beds, tilt tables and equipment in the gymnasium and hydrotherapy areas.

3. Design development
Design development is where the selected concept is visually and conceptually expanded upon by the designer (Stone, 2010). In this case, I created a list of 34 items, based on what I had learned to be important during the hospital tour and conversations with the health professional. To turn these into images I referred to my earlier sketches and notes, as well as reference images. I used a style based on geometric forms. After creating the base structure of all 34 images, I revisited each one to add pattern, line work, variations in tone, and shadow. I also checked all images for consistency; for example, the main character needed to be wearing the same pattern clothing in most images, and each time the patient’s room was shown the colours and features needed to be similar.

4. Prototyping
Prototyping is the stage where the developed design is produced in a format that can be tested and is a method of visualising, evaluating, learning and improving (Lidwell, Holden & Butler, 2003). At this stage, I had given a lot of thought to the material the cards should be printed on and sought advice from printers. The recommendation was to get the cards laminated because laminating is extremely durable and there is no chance of damage from repeated wiping with wet wipes for infection control. Laminating also reduces the chance of wear and tear over time. As I wanted to avoid the unstylish look of laminated edges, I asked for them to be trimmed for the first design prototype. I needed to evaluate how this worked with patients and seek the opinion of the health professional after the first round of evaluation.

![Figure 3: Flash card concept](image-url)
5. Evaluation

Under the 3-Corner Collaborative Design Model, evaluation is when a design is tested with a target audience and the results are analysed (Paulovich, 2015). The health professional used the flash card resource with patients and documented her interactions on a checklist (see Table 1). Approximately one month later, I interviewed the health professional to determine how the flash cards were being used in practice, focusing on both positive and negative experiences, and identifying areas that could be improved.

During this round of evaluation, the health professional had a parent review the cards. The parent identified the sharp edges of the cards as a potential injury hazard (particularly for her child who had reduced fine-motor skills), and recommended that the edges be rounded. We agreed to this as the logical solution. The parent also commented on the lamination as being slippery and difficult for some patients to handle, especially when used on equally slippery surfaces like tabletops. However, to comply with infection control protocol, the lamination is required so that the artwork does not become damaged from constant sterilising. Using the cards on a softer surface, such as bed sheets, would enable them to be handled more easily. A final suggestion was made by the health professional to include another card to open up conversation about the paediatric rehabilitation department website, which is a critical source of information for patients and families.

Despite some suggestions for improvement, feedback about the design prototype was overwhelmingly positive. According to the health professional they worked “brilliantly” and “opened up conversation and improved communication around past and future rehab” (Rehabilitation Clinical Practice Consultant, August 2012). Patients were able to perform tasks with the cards to demonstrate their understanding of the topic. The health professional asked one particular patient to select cards from the deck to show her rehabilitation progress and “that showed that she had a great understanding of her journey” (Rehabilitation Clinical Practice Consultant, June 2013). The cards cover a broad range of experiences from ‘arriving at hospital’, ‘playing in the park’, and ‘getting an ice cream’ to ‘going home’. Some of the cards are task focused, such as ‘hydrotherapy’, whereas others are more useful for goal setting such as ‘day release’ or ‘going home’. Task-based cards allow for rehabilitation routines to be established, for example, using them to develop a timetable.

Table 1: Rehabilitation checklist data from first evaluation round

<table>
<thead>
<tr>
<th>Use</th>
<th>Level of patient understanding of flash cards</th>
<th>Supporting comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>HIGH</td>
<td>16-year-old acquired brain injury (ABI) inpatient. Found the cards very useful in discussing future therapy. Liked the simplicity of the cards. Power of art when having trouble with cognition.</td>
</tr>
<tr>
<td>2</td>
<td>HIGH</td>
<td>13-year-old spinal cord injury (SCI) inpatient. Showed cards during therapy session. Wheelchair card opened up conversation about community support available, for example, Paraquad.</td>
</tr>
<tr>
<td>3</td>
<td>HIGH</td>
<td>8-year-old ABI ambulatory patient with cognition and speech issues. Cards helped with communication. Patient selected cards that represented her journey. Health professional, patient and parent had a long discussion (debrief) using these cards. They then counted the cards. Mother and patient “loved them”.</td>
</tr>
<tr>
<td>4</td>
<td>MID</td>
<td>15-year-old catastrophic head injury (CHI) inpatient. Agitated state. Just out of post-traumatic amnesia (PTA). Health professional discussed the rehab journey with this difficult patient. Cards helped to describe the rehab service.</td>
</tr>
</tbody>
</table>
for therapy. Goal setting cards are more suited to reflecting on the patient’s past and future journey. While some of the cards are specific to paediatric rehabilitation, such as the department website card, the majority of the set is broadly applicable to the hospital experience in general; therefore, there is potential for the flash cards to be developed further for other health areas.

The health professional found the cards helpful in raising difficult topics, and when interacting with difficult or agitated patients. Specifically, the health professional found the wheelchair card useful in discussing community-based support services with a patient who was having difficulty coming to terms with her tetraplegia diagnosis. “I showed her the card … which had a child in a wheelchair and it opened up conversation for me which I’d had trouble about bringing up, actually, on Paraquad” (Rehabilitation Clinical Practice Consultant, June 2013).

6. Redesign
Redesign is where feedback from the evaluation phase is used to inform any changes to the design (Paulovich, 2015). After the first round of evaluation we made some minor changes to the design prototype. The first was the addition of a website card and the second was to produce the laminated cards with rounded edges as suggested by one of the end-users. The third was the addition of durable packaging (see Figure 4).

7. Evaluation and solution
After making these changes, the new prototype was given to the health professional to use with patients. Again, one month later, I conducted an interview, to evaluate the changes we made to the design (as shown in Table 2). However, the health professional used the cards with him an intensive way, and was able to provide many useful comments about the interaction. This patient was a 15-year-old male who had suffered a stroke. He had significant cognitive issues before his stroke, which made him a complex patient. The health professional found that the cards were very helpful in terms of talking him through the rehabilitation process. In addition, she used the cards to play concentration games with the patient, “I used it as a therapeutic thing as well, to see if he could remember things” (Rehabilitation Clinical Practice Consultant, October 2013).

The following is a list of the most positive attributes associated with the flash card resource as identified by the health professional and her patients over the course of the collaboration:

- The ability to add and remove cards to simplify education for patients and families who are particularly stressed is very helpful.
- The simplicity of the drawings is great because they show what they need to show, but that’s all.
- The cards are something that can be left with the patients so they can absorb the information at their own pace.
- The cards act as a conversation starter.
- The cards are a memory prompt for me.
- They comply with infection control.
- The cards fostered conversation about different rehabilitation activities.
- The cards facilitated discussion about difficult topics.
- Useful in goal setting for patients.
- Useful in reflecting on patient journeys.
- Inclusive of ethnicity and gender.
- Consistent use of images and colour.
- Language was simple and clear; title is contemporary.
- Transportable, compact, cards are a good size.
- Potential to be used in games; games as a learning process (Rehabilitation Clinical Practice Consultant, June & October 2013).

At the end of this evaluation round no further amendments to the design were needed; therefore, we had arrived at a solution.

Discussion
Poor communication in health is a persistent problem. This is significant as it has been demonstrated in a 2013 analysis of 887 sentinel events reported to the Joint Commission for Hospital Accreditation that approximately 63% involved communication as a root cause (The Joint Commission, 2014, p. 8). These events can be attributed to a number of issues including health professional factors, patient factors and organisational factors such as information management. These factors interrelate with each other, making communication within health an extremely complex phenomenon with great potential for error. However, the provision of health information that is well-designed, clinically accurate, easily understood by the majority and gives clear

<table>
<thead>
<tr>
<th>Use</th>
<th>Level of patient understanding of flash cards</th>
<th>Supporting comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>MID–HIGH</td>
<td>15-year-old stroke patient. Cognitive problems post-stroke. Cards were an excellent visual tool, which helped the child gain a greater understanding of the program. Good prompt for clinician.</td>
</tr>
</tbody>
</table>

Table 2: Rehabilitation checklist data from second evaluation round
advice that can be acted upon, is within reach for all healthcare providers. Designers, health professionals and the 3-Corner Collaborative Design Model, are critical components in achieving this goal. The 3-Corner Collaborative Design Model (Figure 1) is a collaborative design approach where the designer works very closely with the health professional to gather information and build a picture of the patient experience. This information is then synthesised by both the designer and the health professional to develop a design solution.

This way of working (collaborating, evaluating and redeveloping the designs based on feedback) is not always used in the development of patient education materials. Furthermore, a designer that visits and embeds themselves in the health field in an ethnographic manner is unusual. While ethnography is becoming a more common approach to gaining qualitative data in the health field (Caprara & Landim, 2008; O’Reilly, 2009), and multidisciplinary collaboration is becoming more widely accepted in health, there is little documentation of a combined approach for the development of site-specific health education materials. Certainly, the health professional I worked with had not encountered this approach, but she was able to see the benefits of the 3-Corner Collaborative Design Model in the form of a tangible design outcome that met her needs. Additionally, the time commitment required from the health professional was minimised and approved by the head of the department to fit within her typical duties. While resourcing is a barrier to this type of work, options such as working with students or in-house graphic designers can be considered, and funding can come from small department allocations or external organisations. The time efficiency of this model urges us to explore the impact that this way of generating resources might have on future health education development and practice.

The health professional was highly impressed with the creative and thought processes that contributed to the development of the design, stating “all the thought you’ve put into this is amazing” (Rehabilitation Clinical Practice Consultant, August 2012). She thought it was really important for me to present the creative process and resulting outcome to the health care team because “quite often in health we hear a lot about stuff, but we don’t see it completed … all of a sudden people forget about it” (Rehabilitation Clinical Practice Consultant, October 2013). She emphasised how pleased she was that we had completed this project and persevered through multiple delays. Comments such as “I think the MRI one’s amazing”, and “I think you’ve absolutely nailed it” (Rehabilitation Clinical Practice Consultant, September 2012) were confirmation that I had produced an idea that the health professional thought was valuable, useful and that she was excited about using. Involving the health professional in the design process ensured that she was familiar, comfortable and confident with the content and form of the design prototype and was able to use the flash cards to enhance the way she delivered rehabilitation information to patients. Being part of the process gave her ownership of the design, facilitated self-reflection around her education topic and prompted her to reflect on how she was delivering information to patients.

**Conclusion**

Rehabilitation is a long and complex journey with patients recovering at different rates and to varying degrees. Because of this, education, goal setting and therapeutic activities need to be customised to each individual patient, their requirements and their abilities. Over a number of meetings that followed a design process model, a comprehensive set of flash cards that depict various elements of the paediatric rehabilitation journey was created. The flash card format resulted from the need for flexibility and customisability in reflecting patient journeys. The health professional participating in the project was generous with her time, showing me around the hospital and providing access to facilities that I wouldn’t have been able to see as a member of the general public.

The flash cards were evaluated by the health professional in real-life patient education sessions and minor amendments were made to the design as a result. Overall, patients and parents responded very positively to the design and, significantly, the health professional found that it impacted her education practice. The card set acted as a prompt, reminding the health professional of some of the intricacies of the rehabilitation journey. The cards were also useful in opening up conversation about difficult subjects such as disability services.

The unique, new and highly valuable 3-Corner Collaborative Design Model details a collaborative approach to the design of patient-centred education materials, but also offers a method for evaluating the success of such designs. By allowing health professionals to use and evaluate educational materials, we are able to gain insight into how they function in the real world. When looking at the outcomes and future directions of this research, it is important to build scenarios of potential futures (Manzini, 2007). What could happen if the 3-Corner Collaborative Design Model was adopted as the mainstream way of generating patient-education materials throughout Australia? If collaborative design techniques were integrated into the provision of all health information, what would the healthcare experience look like? By asking and acting upon these questions, we can continue to encourage and facilitate positive change and development in health promotion through multidisciplinary design and health collaboration.
References


Rehabilitation Clinical Practice Consultant. Interviewed by: Belinda Paulovich. 13 Sep 2012.

Rehabilitation Clinical Practice Consultant. Interviewed by: Belinda Paulovich. 7 June 2013.


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This section brings news of the four prize winners at the recent ARNA national conference in Brisbane and their abstracts. The winner of the Royal Rehab Research Prize was Murray Fisher for a presentation titled, ‘An exploration of the nature and extent of patient dependence in relation to urinary elimination in inpatient rehabilitation in Australia’. The winner of the Lizzie Schruers first-time presenter’s prize, sponsored by the Vic/Tas Chapter of ARNA, was Mei Lau for a presentation titled, ‘Engaging nurses through clinical supervision at Calvary Health Care, Kogarah’.

This year two prizes were awarded for posters. The judges’ best poster prize, sponsored by the SA/NT/WA Chapter of ARNA, was won by Denise Shotton and Tania Miller for a poster titled, ‘Cognitive impairment and falls in a rehabilitation setting’. The delegates’ choice poster prize, sponsored by Greenslopes Private Hospital, was won by Stacey MacKenzie for a poster titled, ‘Break the fall – reducing inpatient falls’.

Best research paper:

An exploration of the nature and extent of patient dependence in relation to urinary elimination in inpatient rehabilitation in Australia

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Co-authors:
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Tara Alexander AROC, University of Wollongong

Abstract

Background: Urinary continence and bladder management is an important domain of rehabilitation nursing practice. This is reflected by a recent spike in nursing scholarship and research on urinary and bladder management in rehabilitation. Examples of this research include: the recent study by Matthews et al. (2013) on the prevalence of urinary tract infection on admission to rehabilitation and the Wicks’ (2014) study on catheter knowledge of specialist community rehabilitation nurses.

Purpose: The purpose of the collaborative project was to establish an understanding of the scope of patient need and outcomes in relation to urinary elimination in inpatient rehabilitation in Australia.

Methods: This project analysed admission and discharge scores for the bladder management FIM item to develop a snapshot of patient dependence relating to urinary elimination in inpatient rehabilitation in Australia. Five years (1 July 2009 to 30 June 2014) of aggregated de-identified inpatient data held in the Australasian Rehabilitation Outcomes Centre (AROC) Registry Database was accessed in February 2015. Relationships between the bladder item FIM scores and a range of other parameters within the AROC database were explored, such as differences over time, impairment code, AN-SNAP class, length of stay, age, sex, and so on.

Results: The five-year dataset contained admission and discharge FIM scores for bladder management for 388,279 episodes of rehabilitation care in Australia. On admission each year across all impairment groups, two in five patients required no assistance with bladder control and did not use any assistive devices or require medication for bladder control (FIM score of 7). This increased to three in five on discharge from rehabilitation. Annually, one in four patients admitted and discharged from rehabilitation independently used an assistive device or required medication for their bladder control.

Each year roughly one in 10 patients need maximum or total assistance on admission with their bladder management (FIM score of 2 or 1); declining to one in 20 by discharge. The high-
level need for assistance with bladder management varied greatly by the patient’s impairment. Half of all spinal patients and a quarter of all stroke patients compared to fewer than one in 20 orthopaedic replacement patients required two helpers on admission. At discharge, this declined to one in five spinal and one in 10 stroke patients still requiring two helpers, compared with less than 1% among orthopaedic replacement patients.

Over this five-year period, two in five patients’ bladder management improved (their FIM score increased from admission to discharge), three in five were unchanged and 2% declined. Two-thirds of the patients with an unchanged bladder FIM score were admitted with a score of 7 (completely independent). One in five patients with a bladder FIM score of 1–6 remained unchanged.

Further analysis will consider the impact covariates such as sex and age above and beyond the patient’s impairment, and how length of stay and other FIM items vary by the bladder FIM item score on admission.

Discussion: Over time, the scoring of the FIM bladder item has remained consistent. Most variation in the bladder FIM item score is explained by the impairment, although age and sex also contribute.

Conclusion: This study examined a five-year data set and highlights, in part, nursing’s contribution to patient rehabilitation outcomes, albeit through one of the FIM outcome measures.

Best first-time presenter:

Engaging nurses through clinical supervision at Calvary Health Care, Kogarah

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Co-author:
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Abstract

Background: Staff surveys at Calvary identified cultural and practice issues for nurses. Informal supervision had previously supported nurses to develop clinical skills and knowledge. A structured approach with external facilitation was proposed to further explore ways for nurses to work with difficult situations using a process of guided self-reflection in a group setting.

Aim:
• To develop and test a new model of clinical supervision to support nursing staff working in rehabilitation.
• To help nurses develop reflective practice skills.
• To test the effectiveness of an external facilitator.
• To promote staff wellbeing.

Methods:
• Using the ‘Reflective’ model in HETI Superguide: A Continuum for Nurses and Midwives, clinical supervision was introduced.
• Three groups attended weekly one-hour sessions for eight weeks, with six per group using an external facilitator.
• The Myers Briggs Type Indicator (MBTI) provided insight into communication styles.
• Pre and post evaluations and attendance monitored effectiveness.

Results:
• Twenty-four sessions held (74% attendance).
• Nurses reported MBTI increased self-awareness of communication styles.
Abstract

Background: Rehabilitation units, including Greenslopes Private Hospital Rehabilitation Unit, have traditionally experienced high fall rates comparative to acute wards due to the poor functional status and multiple comorbidities of its clients. Significant injury, extended stays and poor outcomes for clients are all associated with hospital falls. Cognitive impairment is a well-documented risk factor in falls and ageing societies like Australia are experiencing a rising number of acute and subacute inpatients with dementia and delirium. Dementia and delirium are classified as non-modifiable factors and present a heightened challenge to rehabilitation staff as cognitive impairments will also exacerbate other risk factors such as balance, gait defects and muscle weakness.

Aim: To attempt to identify possible shortcomings in the current falls prevention program by correlating existing data to determine best practice guidelines and strategies for falls management for cognitively impaired patients within a rehabilitation setting.

Methods: To establish contemporary guidelines, a literature review will be conducted of evidence-based and grey literature. Informal staff interviews and evidence-based questionnaires are to be completed, using the Likert scale, to test the validity and reliability of current and prospective falls prevention processes within the rehabilitation unit.

Discussion: Ensuring a valid Fall Prevention program for cognitively impaired patients will positively impact upon this vulnerable client group’s hospital stay and reduce the potential physical, psychological and economic cost of falls.

Conclusion: It will also re-affirm Greenslopes Private Hospital Rehabilitation Unit’s ongoing commitment to providing exceptional patient care.
Delegates’ best poster prize:

Break the fall – reducing inpatient falls

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Abstract

Background: Inpatient falls are a significant issue for health services and account for the highest clinical risk to patient care in the Assessment and Rehabilitation Unit (ARU), Mona Vale Hospital. In response, falls data was analysed, falls-related issues were identified and collaborative action planning took place to address these issues and improve practice. Data analysis identified that the inpatient falls incidence rate for the 2011–12 period was 9.47 per 1000 bed days (mean).

Aim: The aim of this study was to evaluate the implementation of the ARU EOC ward-based falls prevention project in reducing inpatient falls.

Method: Transformational Practice Development

Initiatives implemented:
Through assessment, collaboration and action planning, nurses and allied health recommended and implemented the following improvements to their practice:
- Ongoing educational opportunities for current and new staff.
- Purchase of new equipment including bedside commodes, non-slip chair mats, mobility aids.
- Implementation of the falls alarm mat system.
- Toileting and observation rounds for high fall risk patients.
- Night lighting system.
- Identification of high falls risk patients on handover sheet, patient journey board and patient bedside.
- Consistent approach to discussion of falls prevention strategies at bedside handover.
- Introduction of the ARU Falls Working Party to regularly review systems and potential hazards which may contribute to falls.
- Collaborative multidisciplinary approach to patient and family education on falls prevention and management.
- Biweekly inpatient physiotherapist-led balance classes.
- Daily inpatient physiotherapist led strengthening classes.
- Weekly inpatient falls education and prevention classes led by occupational therapists.

Results: Following the implementation of this EOC project, the recent statistics have shown a reduction of 45% for inpatient falls in ARU. Data analysis identified that inpatient falls incidence rate has decreased from 9.47 to 5.22 per 1000 bed days (mean) since implementation and has been sustained for the past two years.

Discussion: The study evaluated the implementation of the EOC ward-based falls prevention project in reducing inpatient falls. The results showed since the implementation of the project, staff were able to reduce inpatient falls by 45% and sustain this reduction for a two-year period.

Conclusion: The EOC project has enabled the staff to improve patient outcomes through effective communication, action planning, implementation of strategies and evaluation processes which enhance patient safety. Further initiatives to be implemented and evaluated are to collate and compare data regarding implementation of inpatient falls prevention groups, ongoing education relating to falls prevention and management strategies, and to develop and implement ways to further engage patients and visitors in falls prevention.
Clinical commentary

Considerations for determining a bladder scan protocol

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Abstract

The bladder scan enables assessment of bladder volumes and abnormalities of bladder emptying. Using a bladder scan as a diagnostic tool requires correct technique as well as guidelines to inform clinical practice. These suggest when to perform a scan, assisting with interpretation of the results and clinical decision-making, choosing nursing actions and preventing adverse patient outcomes. This clinical commentary provides information relevant to clinicians in the rehabilitation setting and suggests some key practice points and parameters for determining a bladder scan protocol.

Introduction

Bladder scans are routine in various health settings (Stevens, 2005). Their use is particularly relevant within the rehabilitation unit where many patients are admitted with urinary incontinence, functional impairments putting them at risk for incontinence or altered bladder functioning resulting from neurological conditions (Stevens, 2008). Utilisation of technology as a diagnostic tool requires both procedural and clinical knowledge to enable interpretation of results for decision-making. However, there are difficulties with availability of clinical information at the bedside. Also, there is disagreement in the literature about significant volumes for post-void residual, volumes indicating urinary retention, and for actions to take in response (Kim et al., 2012; Lee, Tsay, Lou & Dai, 2007; Ostaszkiewicz, O’Connell & Ski, 2008; Stevens, 2005). Therefore, it is necessary to determine a bladder scan protocol relevant to the clinical setting.

The aim of this clinical commentary is to provide information that can support nursing clinical decision-making when using a bladder scan as a diagnostic tool and to promote best practice in the care of altered bladder function. The information is a guide for general use and in circumstances such as spinal cord injury there will be specific agreed local practices to follow. A ‘one size fits all’ bladder scan protocol is not possible.

The following sections provide background information, answers about why and when bladder scans are performed, and proposes some practice points to aid clinical decisions for inclusion in locally developed bladder scan protocols.

Background

The bladder scan has been available in the clinical setting for many years and measures bladder volumes by creating an ultrasound image which calculates and displays the urine volume (Pelman, 2007; Verathon, 2014). Bladder scan technology has the advantages of being a portable, non-invasive procedure, that is cost-effective (reducing nursing time and the cost of catheter equipment). It prevents unnecessary catheterisation, eliminates potential trauma to patients and reduces nosocomial urinary tract infection rates (Altschuler & Diaz, 2006; Lee, et al., 2007; Newman, Gaines & Snare, 2005; Stevens, 2005). The bladder scan replaces intermittent catheterisation as a means to assess bladder volumes. Studies have shown a high degree of accuracy (Altschuler & Diaz, 2006; Lee et al., 2007; Newman et al., 2005). However, reliable and accurate results require correct operation. Refer to Box 1 for some hints to aid accuracy.

Box 1: Hints for aiding accuracy when using the bladder scan

• Perform the bladder scan within 10 minutes of voiding (if being used to determine a post-void residual).
• Use adequate amounts of manufacturer-recommended ultrasound gel (not lubricant meant for catheter insertion).
• Ensure the gender setting is correct and set to male for women who have had a hysterectomy.
• Correct position/direction of the scanner head, so that it is facing the correct way and the full image appears in the centre of the screen.
• Keep the scanner head still while scanning.
• Ensure the battery has sufficient charge.

(Altschuler & Diaz, 2006; Newman et al., 2005)
It is important to note that, although generally reliable, individual patient factors can affect bladder scan results. These are obesity, ascites, scar tissue, mass, incision sutures and staples, constipation (Altschuler & Diaz, 2006) as well as bladder volumes 1000 ml and over and pregnancy (Verathon, 2014). These factors affect ultrasound accuracy through interference with the scanning technology or ability to tell the difference between a volume in the bladder and volume of fluid or other matter not in the bladder. Being overweight or with larger abdominal tissue increases the depth for the scan to penetrate. Asking the patient to hold their abdomen up and away assists the operator. If concerned about accuracy and if any of these factors are present, an in and out (straight) catheter can determine actual volume and be compared with the bladder scan result.

Instructions for use are provided by the manufacturer in written and video formats and online via the internet. Despite stating, “your facility will provide you with policies and procedures ... for use with your patient population” (Verathon, 2014, p i), clinical guidelines and the necessary information enabling interpretation of results are not readily accessible or are lacking. These deficiencies and the lack of consensus in the literature about significant bladder volumes complicate decision-making. Also, it is important to understand the physiology and aetiology associated with altered bladder function relevant to the group of patients in the clinical setting. There are significant differences between circumstances, for example, acute use of an indwelling catheter for bladder protection during surgery and altered bladder post-anaesthetic, with more insidious or chronic clinical situations such as after a stroke.

Relevance to rehabilitation

In rehabilitation, neurological conditions commonly cause altered bladder functioning. Prevalence of incontinence post-stroke ranges from 37% to 79% (Dumoulin, Komer-Bitensky & Tannenbaum, 2005), following spinal cord injury 80% and following post-traumatic brain injury 61% (Stevens, 2008). Damage to the peripheral nerves by diabetes can result in an underactive bladder and retention or high post-void residual (Fowler & O’Malley, 2003; Newman et al., 2005). Conditions such as multiple sclerosis and Parkinson’s disease can cause fluctuating and progressive changes to bladder function.

Complexity occurs as patients may present with a new bladder dysfunction or have issues which may or may not have been symptomatic before their hospitalisation. In some, the illness event precipitates a worsening of the bladder dysfunction or may expose a previously undiagnosed issue. For example, long-standing diabetes may affect the sensory and motor nerves innervating the bladder, leading to bladder atonia and chronic retention. This may have gone unnoticed previously or has become exacerbated by an acute illness. In men, prostate enlargement is of particular concern and should always be suspected, investigated or excluded. Symptoms of outlet obstruction may worsen or be revealed during hospitalisation, and urinary retention with overflow may be mistaken for stress or urge incontinence. Other complicating factors include catheterisation, failed “trial of void”, poor bladder management, and urinary infection. While urinary infection can affect bladder function, history of infection can also be indicative of chronic urinary retention. Constipation is another problem impacting bladder function, with high rates of up to 80% in older people in hospital (Continence Foundation of Australia, 2010).

In the rehabilitation setting, altered bladder function can be temporary with improvement or restoration of normal function. Patients arrive following acute events with varying length of hospitalisation prior, having a mix of experiences and functional recovery. These aspects of acute/chronic presentation, different underlying pathophysiology, effects of hospitalisation, and recovery patterns contribute to the complex character of altered bladder function in rehabilitation.

It is recommended that facilities serving populations affected with urinary retention and incontinence should consider implementing a bladder ultrasound protocol specific to their population (Stevens, 2005). Nurses need to develop and disseminate these protocols and incorporate them into practice to improve the quality of care (Stevens, 2005). These recommendations are relevant for rehabilitation units.

Why bladder scan?

A bladder scan is an essential tool for assessing the two main functions of the bladder – the capacity to store and the ability to empty urine. There are a number of reasons for using the bladder scan (see Box 2). A most important reason is the lack of symptoms of urinary retention or high post-void residual associated with neurological conditions and with cognitive impairment. In these circumstances, the hidden nature of altered bladder functioning is particularly dangerous for the health of the urinary system. Under-recognition contributes to further damage and potential for adverse patient outcomes (Fowler & O’Malley, 2003; Ostaszkiewicz et al., 2008).
The physiological basis for the lack of reported symptoms by some patients is multifactorial due to the complex neurological processes needed for conscious control of voiding. Damage to the cortex and pons can affect the interpretation of sensory information and motor responses. Damage to the spinal cord affects the passage of sensory and motor communication between the bladder, sacral and cerebral micturition centres. Peripheral nervous system damage inhibits transmission of sensory information of bladder fullness. Lack of clinician knowledge and lack of timely assessment of bladder functioning in the acute setting can result in prolonged stretching of the detrusor muscle, causing atonia prior to admission to the rehabilitation unit. In the older person, ageing can result in reduced contractility of the detrusor muscle and chronic asymptomatic high post-void residual (Ostaszkiewicz et al, 2008). Any one of these factors or a combination can contribute to bladder dysfunction and a consequent lack of awareness there is a problem by the at-risk patient. Therefore, routine clinician monitoring and assessment are essential.

Box 2: Indications for using the bladder scan

- To assess for post-void residual, urinary retention, or incomplete bladder emptying.
- To prevent urinary retention following indwelling catheter removal.
- To determine bladder volume in patients who have incomplete bladder emptying.
- To determine bladder volume for patients who are on scheduled catheterisation times to drain the bladder.
- To monitor postoperative/post-partum patient.
- To monitor for effects of medications commenced known to cause urinary retention (for example, Amitriptyline prescribed for neuropathic pain).
- To determine bladder volume in a patient with decreased urine output.
- To monitor the patient who is physically unable to void (for example, after spinal cord injury).
- To assist with bladder retraining by determining need to void based on bladder volume.

(Altschuler & Diaz, 2006; Newman et al., 2005; Stevens, E., 2005; Verathon, 2014)

Continued elevated post-void residual may lead to: acute urinary retention; urinary tract infection; pyelonephritis; hydronephrosis; renal insufficiency; renal failure; and overstretching of the detrusor muscle, resulting in an atonic or flaccid bladder (Newman et al., 2005; Palese et al., 2010). Autonomic dysreflexia – a medical emergency for those with spinal cord injury T6 and above (Stevens, K., 2008) can be a severe consequence. Poor bladder management can result in: permanent bladder dysfunction; increased length of hospital stay (Palese et al., 2010); ongoing requirement for continence products; prolonged or permanent indwelling catheter; increased need for community support services; and requirement for residential care.

Implementing standard operating procedures in the rehabilitation unit for routine timely assessment of bladder function, including use of the bladder scan, is essential for all patients with neurological diagnoses, diabetes, history of IDC use, urinary infection or episodes of incontinence. Bowel function should be assessed in conjunction, because of the effect of constipation on the bladder and for urinary retention as a causative factor for altered bowel function. Assessment of bladder function requires systematic methods and documentation and as a minimum includes: urinalysis, accurate recording of input and output for 48–72 hours, noting any incontinence, presence/absence of sensation to void, and bladder scan post void for a minimum of three times at random. This should be continued while symptoms or concerns persist.

As well as standardised routine assessment as suggested for at-risk patients, clinical signs for performing a bladder scan include:

- urinary frequency
- absent or decreased urine output
- urinary incontinence
- bladder distension
- pain, anxiety, confusion
- sensation to void – but unable
- inability to void after catheter removal
- indwelling catheter is not draining (Stevens, E., 2005).

Issues for clinical decision-making when interpreting bladder scan results

Issues for decision-making arise for a mix of reasons. There is a lack of standard guidelines for best practice. The disparity in the literature for defining urinary retention in terms of actual volume and the lack of consensus on normal/abnormal values for post-void residual which can range from 0–300 ml. Gaps also exist in undergraduate education about bladder function. These issues contribute to variation in and lack of knowledge by clinicians performing bladder scans or those interpreting results. Obtaining an accurate bladder volume reading, while essential,
is only one aspect when using a bladder scan. Interpretation of the result needs a body of knowledge and consideration of a range of factors to understand the significance. It is important to not rely only on the bladder scan result. Best practice means considering individual patient variables (see Box 3) and other factors described in the next sections.

**Some parameters for post-void and urinary retention volumes**

Despite issues with decision-making and variations in significant volumes, there are some recommendations from the literature that coincide or are compatible. Parameters for bladder volumes summarised below can be incorporated into guidelines for safe clinical practice and care of the patient with altered bladder function.

**Box 3: When interpreting bladder scan result:**

**Consider a range of variables**

- Bladder scan result
  (as a % of total volume if post-void — requires measurement of urine voided + bladder scan = total volume)
- Fluid intake and hydration status
- Clinical symptoms present
  (for example, urological symptoms and patterns of voiding, pain and anxiety)
- Diagnoses and health history
  (Past and including while in hospital)
- Presence of risk factors
  (for example, neurological condition, diabetes, recent IDC, urinary infection)
- Effect of medications
- Bowel function
  (possible constipation/impaction)
- Possibility of spinal cord injury
  (may be undiagnosed — particularly neurological effects of spinal canal stenosis and cauda equina)

1. As the first sensation of bladder fullness usually occurs at 250 ml, encouraging the patient to void if scanned volumes are 200 ml or greater is recommended by Newman (2005).

2. If UNABLE to void:
   - Amounts over 300 to 500 ml were defined as urinary retention (UR) and may warrant catheterisation if unable to void within a defined time frame and/or has symptoms (Lee et al., 2007). The study by Lee et al. (2007) confirmed UR when the catheter drained over 500 ml.
   - Kim et al. (2012) performed catheterisation at 400 ml if the patient could not void.

3. If ABLE to void:
   - Amounts more than 100 ml were considered post-void residual (PVR) requiring monitoring (Lee et al., 2007; Kim et al., 2012).
   - Whereas, PVR amounts over 150 ml warranted in and out catheterisation using a straight catheter (Stevens, E., 2005).
   - In the stroke population, PVR was accepted from 100–200 ml with resolution over time shown to occur. Once to three times daily monitoring with bladder scan was instituted and in and out catheterisation using a straight catheter at 400 ml (Kim et al., 2012).
   - Repeated PVR greater than 200 ml was considered abnormal and required investigation and referral to a urologist (Newman et al., 2005).

Urinary retention and post-void residual can be acute or chronic in nature. Chronic urinary retention has been recognised as persistent post-void residual over 200 ml and, if asymptomatic and no infection, it can be managed conservatively with regular monitoring. Acute urinary retention is generally (but not always) painful with a palpable bladder where little or no urine can be passed. Acute urinary retention requires urgent catheterisation and a period of bladder rest, followed by a properly monitored “trial of void” (Haylen, 2008).

A framework for nursing assessment and management of urinary retention in elderly hospitalised patients has been developed in Australia (Ostaszkiewicz et al., 2008). Definitive parameters for bladder volumes are not provided; however, factors for decision-making to assist in determining if volumes are clinically significant for that patient group are included.

**Determining a bladder scan protocol**

Appropriate responses to the variable and individualistic nature of altered bladder function are difficult to define. The volumes for urinary retention and post-void residual suggested in this clinical commentary are for consideration within the context of the patient situation. Individual circumstances and unusual presentations may require considerably different measures and responses. Despite these difficulties, it is important to determine a bladder scan protocol which informs clinical practice and guides decision making to maintain bladder health and prevent adverse patient outcomes (Lee et al., 2006). In addition, provision of information for the patient and family is important for understanding assessment and treatment rationale. Individualised clinical decision making that is context-specific requires consideration.
of multiple factors and when determining actions to take, the preferences of the patient for treatment should also be included (Ostaszkiewicz et al., 2008).

It is not possible (nor safe) to mandate a ‘one size fits all’ bladder scan protocol in this update. Instead, information and suggestions can be applied to local circumstances and patient need. Establishing standards will enable measurement and needed research for characterising the nature of altered bladder function in rehabilitation. Details to define for a locally developed bladder scan protocol are listed in Box 4.

**Conclusion**

Information has been provided to aid in best practice in the care of altered bladder function through the appropriate use of the bladder scan and to guide clinical decision making. This commentary has attempted to fill the gap in information about a range of variables that need to be considered when assessing and making decisions about bladder function. Performing a bladder scan is much more than a technical task. It is recommended that rehabilitation nurses determine bladder scan protocols that are tailored to the needs of the patient characteristics in their unit. No guide can allow for all eventualities and individual assessment and consideration of a range of factors and specific circumstances is required. The important and overarching goals are to prevent harm to the urinary system, protect the bladder from damage, support recovery and enable the person to return to participation in valued life activities.

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**Box 4: Bladder scan protocol details**

- Risk assessment – Standards for routine assessments for at-risk patients.
- Consideration of ALL variable factors (as per Box 3).
- Timing of scan post-void (for example, within 10 minutes).
- Timing of intervention if retention present.
- Define scan parameters/actions to take (refer to clinical practice points).
- Fluid intake/output documentation.
- Referral for further investigations and specialist consultation.
- Documentation requirements:
  - Recording results
  - Reason for bladder scan
  - Consent obtained
  - Effect upon patient
  - Nursing diagnoses and actions
  - Physician notification
  - Follow up – bladder management plan
- ‘Trial of void’ protocol for planned IDC removal.
- Education for nursing, medical and other members of the rehabilitation team.

**“REHABILITATION CLINICAL PRACTICE POINTS”**

Some suggested significant bladder volumes

- Encourage voiding in toilet when scanned volume is 200 ml
- If UNABLE to void:
  - **Urinary retention (UR) = bladder scan >400 ml**
  - Requiring in and out (straight) catheter
  - Repeated UR may require indwelling catheterisation
- If ABLE to void:
  - **Post-void residual (PVR) = bladder scan 100–150 ml and asymptomatic, requiring monitoring with regular bladder scan**
  - Symptomatic or bladder scan >200–250 ml perform in and out (straight) catheter, inform and refer to physician.
- Aim to keep TOTAL bladder volume below 400–500 ml
  - Measure what is voided + the scanned volume
  - **Volumes are a general guide, be ALERT for the unusual presentation or individual idiosyncrasy**
- Use aseptic technique if performing any catheterisation
- Obtain consent

---

**“REHABILITATION CLINICAL PRACTICE POINTS”**

Routine assessment on admission of bladder function including use of the bladder scan for all patients with:

- Neurological diagnoses
- Diabetes
- History of IDC use, urinary infection or incontinence
  - **Assess bowel functioning in conjunction**
- Exclude constipation
- Exclude urinary retention
- Exclude outlet obstruction (for example, enlarged prostate)
References


We would like to wish everyone a Merry Christmas and a Happy New Year
Australasian Rehabilitation Outcomes Centre

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Benchmarking Reports
The 2015 year is rapidly coming to an end. As is usual practice, AROC requires the data describing all episodes discharged in 2015 to be entered and uploaded to AROC by the end of January 2016. Given that January is often holiday season for people, can we respectfully suggest that facilities ensure that their AROC data is as up to date as possible before the silly season gets under way.

The 2015 Calendar Year Benchmarking Reports should be available by the end of March 2016.

Does age impact stroke rehabilitation outcomes?
AROC recently undertook some analysis of stroke rehabilitation outcomes, and presented the findings at the Stroke 2015 conference in Melbourne. These findings are re-presented here, with some commentary attached.

Stoke is classified by impairment, and also by AN-SNAP class.

The AROC stroke impairment codes are:

**STROKE – haemorrhagic**
1.11 Left Body Involvement (Right Brain)
1.12 Right Body Involvement (Left Brain)
1.13 Bilateral Involvement
1.14 No Paresis
1.19 Other Stroke

**STROKE – ischaemic**
1.21 Left Body Involvement (Right Brain)
1.22 Right Body Involvement (Left Brain)
1.23 Bilateral Involvement
1.24 No Paresis
1.29 Other Stroke

The **AN-SNAP classes** relating to stroke are:
- 3-204 Stroke, FIM motor 63–91, FIM cognition 20–35
- 3-205 Stroke, FIM motor 63–91, FIM cognition 5–19
- 3-206 Stroke, FIM motor 47–62, FIM cognition 16–35
- 3-207 Stroke, FIM motor 47–62, FIM cognition 5–15
- 3-208 Stroke, FIM motor 14–46, age>=75
- 3-209 Stroke, FIM motor 14–46, age<=74
- 3-203 Stroke (and other), FIM motor 13

Some 9% of all episodes reported annually to AROC relate to stroke. This translates to AROC receiving data describing more than 8,000 episodes of inpatient stroke rehabilitation per year in Australia, and 1,800 in New Zealand (Figure 1).
The age and gender distribution of people admitted for inpatient stroke rehabilitation is shown in Figure 2.

Figure 3 shows the age distribution of inpatient stroke rehabilitation patients by decades, with Australian data presented in the outer circle and New Zealand in the inner circle. In Australia two-thirds of all stroke patients are aged 70 years and older, with 31% of stroke patients in their 80s.

**Average age (95% CI)**

<table>
<thead>
<tr>
<th>Age Group</th>
<th>NZ (75.1–76.0)</th>
<th>Aus (75.1–76.0)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;50</td>
<td>7%</td>
<td>5%</td>
</tr>
<tr>
<td>50s</td>
<td>9%</td>
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</tr>
<tr>
<td>60s</td>
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<tr>
<td>80s</td>
<td>13%</td>
<td>38%</td>
</tr>
<tr>
<td>90+</td>
<td>9%</td>
<td>12%</td>
</tr>
</tbody>
</table>

**Stroke outcomes by age**

In terms of length of stay (LOS), younger stroke patients clearly stay longer (Figure 6), and this is consistent across countries. They also achieve a greater degree of functional improvement during their LOS (Figure 7).
In terms of discharge destination, Figure 10 shows that the proportion of people returning to a private residence post-inpatient stroke rehabilitation decreases with age. Over 90% of people aged 59 and younger return to a private residence post-stroke rehabilitation, dropping to 60% of 90+ year olds returning to a private residence in Australia and less than 50% in New Zealand.

In summary, it appears that age does affect stroke rehabilitation outcomes, but that interestingly that impact is independent of stroke type (impairment) or severity. Younger stroke sufferers undergoing rehabilitation have a longer LOS, achieve greater functional improvement, and are more likely to be discharged to a private residence.

**Figure 7**

When we adjust these raw outcomes for case mix the picture is the same. That is, as shown in Figure 8, in Australia a person less than 50, no matter how mild or severe their stroke, stays almost 7 days longer than the benchmark LOS. Conversely a person in their 90s stays 3 days less than benchmark. In New Zealand, the pattern is slightly different, with younger people receiving close to benchmark LOSs, but older people having significantly shorter LOSs. This overall pattern is continued when the case mix adjusted functional improvement is reviewed (Figure 9).

**Figure 8**

**Figure 9**
Aims and scope

Rehabilitation nursing is a recognised specialty area of nursing within Australia with a broad and expanding knowledge base. As the official Journal of the Australasian Rehabilitation Nurses’ Association (ARNA), JARNA seeks to enhance this expanding knowledge base through the publication of information pertaining to rehabilitation nursing. An equally important purpose of JARNA is to facilitate the development of ARNA members as writers for publication by providing constructive feedback to authors.

Prospective authors are asked to follow the following guidelines when compiling a manuscript they wish to submit for consideration for publication in JARNA.

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JARNA is published three times a year and manuscripts pertaining to rehabilitation nursing are invited. The Editor welcomes manuscripts on research, quality activities, innovative practice, education, management, case studies and any other item of interest to rehabilitation nurses. JARNA also invites new and first-time authors, with mentoring provided by the Editorial Board to assist in achieving publication standards.

All work will be sub-edited to the journal’s style. The Editor reserves the right to modify the style and length of any manuscript submitted, so that it conforms to journal format. Major changes to a manuscript will be referred to the author for approval prior to publication.

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All work must be stated that it conformed to the “National Statement on Ethical Conduct in Research involving Humans” by the National Health and Medical Research Council of Australia, or equivalent in other countries or the Declaration of Helsinki.

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The peer-review process is managed online. Decisions are communicated by email to the corresponding author. Submitted manuscripts are acknowledged by email.

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Journal

volume number(issue number), page numbers.

Antonakos, C. L., & Kazanis, A. S. (2003). Research process in
the health sciences: A focus on methods. *Research and Theory
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Book

Location: Publisher.

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Edited book chapter

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- Available in a wide range of shapes and sizes
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Pressure injuries are one of the five most common causes of harm to patients¹ despite being a largely preventable health problem². Skin protection is paramount to the prevention of skin breakdown and pressure injuries².

References: