

AUSTRALIAN + NEW ZEALAND CONTINENCE JOURNAL

A longitudinal study of asymptomatic rectocele

Jacqueline R Woodman, Tim Cowan,
Emmanuel Karantanis & Kate H Moore

**A scoping study of paediatric continence service
provision in the Great Southern region of Western
Australia**

Emma Goetze, Katherine McLean, Judith Thompson,
Angela Jacques & Kathy Briffa

**Development of a long-form screening tool to identify
clinically relevant co-morbidities of nocturia**

Wendy F Bower, Claire F Ervin, D Michael Wishaw & Fary Khan



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The *Australian and New Zealand Continence Journal* seeks articles and original research papers from people practising and researching the management and treatment of incontinence and continence health promotion.

Do you need topic ideas? A variety of topics are possible and include, but are not limited to: outcome studies, aged care, paediatrics, pregnancy and childbirth, novel drug therapies, reviews of devices, either surgical or non-surgical, assessment articles, literature reviews of continence-related topics, home and community care issues and successes, men's health, nursing management, physiotherapy management, support by other allied health disciplines (including occupational therapy and social workers), the psychological impact of living with incontinence, ethical issues, cultural issues and collaborative approaches to care.

Articles may be papers for peer review, clinical updates, case studies or evaluation of programs.

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*Chartier-Kastler E et al: Randomized, crossover, prospective, multicentre study comparing quality of life related to the use of urinary sheaths versus diapers in incontinent men, BJU Int 2011; 108:241-247

EDITORIAL

Welcome to the winter edition of the *Australian and New Zealand Continence Journal*. It is with pleasure the Editorial Board presents an edition with a variety of interesting papers. We thank the authors and the reviewers for their input, which allows us to prepare a journal showcasing our Australian and New Zealand researchers. You may recall that this is in contrast to our autumn edition, which was slim. At that time, the Journal Editorial Board was concerned that local researchers were not using this journal as a vehicle to publish their research. However, for now, that concern is reduced, with the publication of this edition, and more papers under review for the next edition. We thank the authors published in this edition and those who have submitted, for their support of our local journal, and we hope to see more authors submitting their research to this journal for publication.

The three papers published in this edition have very different implications for clinical practice and health service delivery. The papers both challenge current practice and call for a change in practice and in health service provision.

The paediatric continence survey undertaken in the Great Southern health region of Western Australia reports the inadequate intervention for young children with incontinence in the early school years in this rural area. Is this inadequate intervention due to the poor availability of health services, or lack of parental awareness of the condition? Or does the lack of accessible services contribute to lack of parental awareness? As we approach a period of uncertain political climate in Australia, we need to ensure our commitment to adequate funding for health care provision is paramount, particularly in our rural areas and for the most vulnerable in our society.

The TANGO paper tackles the difficult topic of nocturia and presents the initial development of a screening tool to identify the many causes of nocturia in individual patients. Such a screening tool will make a large difference to clinical practice, to ensure we are able to identify causes of nocturia beyond lower urinary tract symptoms. In this neglected area of continence management, it is high time resources were developed for this purpose and the authors are to be commended for their work in this area.

The authors of the longitudinal study on asymptomatic rectocele present findings that may surprise us all. Common risk factors associated with rectocele, such as increasing age and BMI, constipation, post-menopausal status and previous pelvic floor muscle training, were not associated with progression or regression of rectocele at five-year follow-up. In fact, most patients had no change in their symptoms over those five years.

The Journal Editorial Board encourages your continued support of this journal. There are many ways you can provide this support, such as, writing letters to the editor, commenting on papers published in the journal, providing critical reviews of recently published papers in other journals, and submitting ideas for, or submitting, systematic reviews. Review articles are appreciated by readers as they both inform and guide clinical practice. We look forward to hearing from you, and reviewing your submissions.



Margaret Sherburn

ANZCJ Editor



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A longitudinal study of asymptomatic rectocele

ABSTRACT

The aim of this study was to reassess symptoms and signs of asymptomatic rectocele in women five or more years post initial diagnosis and to determine any factors associated with a worsened condition. Women diagnosed with asymptomatic demonstrable rectocele and seen at one centre between 1992 and 1999, were recruited via letter, which included information about the study. Once consent was received, participants were sent the Birmingham Bowel and Urinary Symptoms Questionnaire and invited to attend for reassessment of their condition and examination. At this appointment, the main outcomes were the questionnaire, pelvic organ prolapse examination, and Baden-Walker scale.

Of the 316 consecutive women diagnosed with asymptomatic rectocele who were contacted, 130 letters were returned "address unknown", 18 declined to participate, 49 had died and 19 did not reply. Of 100 replies, 4/100 (4%) declined because they had had prolapse surgery, 96/100 (96%) returned the questionnaire, of whom 6/96 (6%) declined further consultation. Of the 90 remaining women who returned the questionnaire, 62/90 (69%) were examined at a median of 5.9 years (IQR 5.1 to 7.3) and 11 women had undergone prolapse surgery, leaving 51 women in the cohort. In 31/51 (61%) remaining patients, the rectocele findings were unchanged: all remained asymptomatic; 20/51 (39%) had a more advanced rectocele on examination but only 5/51 (9.8%) had developed overt symptoms. Rectocele progression was not associated with age, body mass index, oestrogen status, pelvic floor muscle training, or a history of constipation. Rectocele progression was associated with greater median bowel symptom scores on Birmingham Bowel and Urinary Symptoms Questionnaire 18.7 (8.2 to 23.7) than non-progression 12.3 (4.2 to 16.7), $p=0.027$. In most patients (89.2%) with asymptomatic rectocele, symptoms and signs were unchanged at five years.

Keywords: Asymptomatic rectocele, constipation, obesity, longitudinal study.

INTRODUCTION

The natural history of asymptomatic rectocele, that is, a prolapse of the rectum outside its normal confines into the vagina or beyond the introitus without symptoms of "bulge", has received limited attention. Although several studies of uterovaginal prolapse have been reported²⁻⁶, a study of the natural progression of an asymptomatic rectocele does not appear to have been published. Therefore, it is difficult to advise women with this problem as to whether the condition will inexorably progress to a state warranting treatment, or whether simple observation may be appropriate, or whether attention to presumed exacerbating factors such as constipation or obesity is definitely indicated.

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Competing interest statement

The study received funding from The Pelvic Floor Research Trust Fund. The authors have declared they have no relationships or circumstances that present actual or potential conflicts of interest.

Acknowledgements

Preliminary results of these data were presented as an abstract to the IUGA meeting of 20051.

We thank Ms Hayley Leek RN for data collection and Dr Su Sarma for data analysis. We acknowledge a substantial delay in the publication of these full results, due to the international relocation of the first author.

Thus, the purpose of this study was to assess the onset of symptoms over time, to re-evaluate clinical examination at a minimum of five years after the first exam, and to ascertain the impact of suspected risk factors such as constipation or obesity upon the development of worsening symptoms or signs of rectocele.

MATERIALS AND METHODS

A consecutive series of women seen over an eight-year period (1992–1999) and diagnosed with asymptomatic rectocele were re-evaluated at a minimum follow-up duration of five years.

At the first clinic visit, a standard medical history was recorded onto a database, and the question “Do you have any symptoms of a bulge into the vagina?” was asked. Those women who responded in the negative were included in the current study. Questions about bowel habits and constipation were also asked. Constipation was defined as straining to defecate and infrequent passage of stools (less than alternate daily). Note that constipation was not considered to be a “symptom” of rectocele. Height and weight were recorded. Vaginal examination was conducted using the then-standard Baden-Walker Halfway Scoring System of rectocele, cystocele and uterine descent⁷. This consists of degrees of descent: mild descent bulging toward the introitus, moderate descent to the level of the hymenal remnant, severe, descent outside hymenal remnant. Asymptomatic rectocele was diagnosed in women who had no overt symptoms of prolapse but a demonstrable rectocele on examination.

As the main focus of the Pelvic Floor Unit was urinary incontinence, and conservative treatments were provided as first-line management⁸, the urine leakage often responded to conservative therapy, and patients were discharged. Even if they came to surgery for stress incontinence, the unit’s policy was not to operate upon asymptomatic rectocele, especially if it was scored as mild to moderate on examination.

For this study, ethics approval was obtained from South Eastern Area Ethics Committee (reference

number 04.127). Re-evaluation of the index cases, women diagnosed with asymptomatic rectocele 1992–1999, commenced in late 2004. Each woman was sent a letter signed by the original consultant gynaecologist seeking their consent to participate in the study. Upon gaining consent, a letter containing a validated questionnaire, the Birmingham Bowel and Urinary Symptoms Questionnaire (BBUSQ)⁹ was sent to assess prolapse and bowel dysfunction symptoms. Box 1 lists the questions in the Evacuation Domain of the BBUSQ, which focuses on obstructive defecation symptoms⁹. The BBUSQ was not given when baseline data were obtained because it was not yet available.

At the end of the questionnaire, women were asked if they wished to attend for re-examination. Women whose letter was returned “address unknown”, or who declined to participate were removed from the study. For those women who did not respond to the initial mail out, enquiries were made to the general practitioner listed in their patient notes to determine their whereabouts.

Women who indicated a desire to attend for further assessment were sent a letter explaining the nature of the assessment visit and provided with an appointment. If they did not attend the appointment but phoned to ask for further appointments, these were given. Owing to concerns regarding privacy, patients were not actively pursued if they did not attend their appointment.

At the re-assessment visit, data such as weight gain, onset of menopause, chronic cough, and defecation function were noted. Obstructive defecation symptoms were recorded from the BBUSQ. Because of the known association between colposuspension and subsequent recto-enterocele⁷, details of previous and intervening surgery (including colposuspension) were also obtained. A full POP-Q⁵ examination and pelvic floor muscle assessment was performed by a single observer, a urogynaecology research fellow. Details of the level of the rectocele were recorded in centimetres with respect to the hymenal remnant and the findings were compared with baseline Baden-Walker scoring system results. The POP-Q score of the rectocele was entered onto the database with a notation as to whether the rectocele had worsened, remained the same, or improved.

We hypothesised that rectocele was more likely to worsen in those women who:

- were older (at the time of the first visit) than women with subsequent unchanged rectocele
- weighed more at the first visit
- had discontinued pelvic floor muscle training in the interim
- became menopausal in the interceding years.
- had a history of chronic cough at the first visit
- had a history of constipation at the first visit
- developed a new history of constipation in the interim.

Box 1 : Evacuation Domain of the Birmingham Bowel and Urinary Symptoms Questionnaire³

Do you have to strain to open your bowels?
 How long do you spend in the toilet for each bowel action?
 Do you feel that you cannot completely empty your bowel?
 Do you use a finger or pressure to help you open your bowels?
 Do you use a finger in your vagina to help you open your bowels?
 Do you have the urge to open your bowels but are unable to pass a motion?
 Do you find it painful to open your bowels?
 Do you use laxatives?

Data summaries are presented as median (IQR) and normality was assessed by the Shapiro-Wilks test. Between group differences were analysed by Mann-Whitney or Wilcoxon matched-pairs signed rank tests with the Hodges-Lehmann estimator and associated of confidence intervals. Differences in proportions were expressed as relative risks (RR). Data were analysed using SPSS for Windows (SPSS 14; SPSS, Inc. Chicago IL, USA) and GraphPad Prism for Windows (Prism 6.02; GraphPad Software Inc., La Jolla CA, USA).

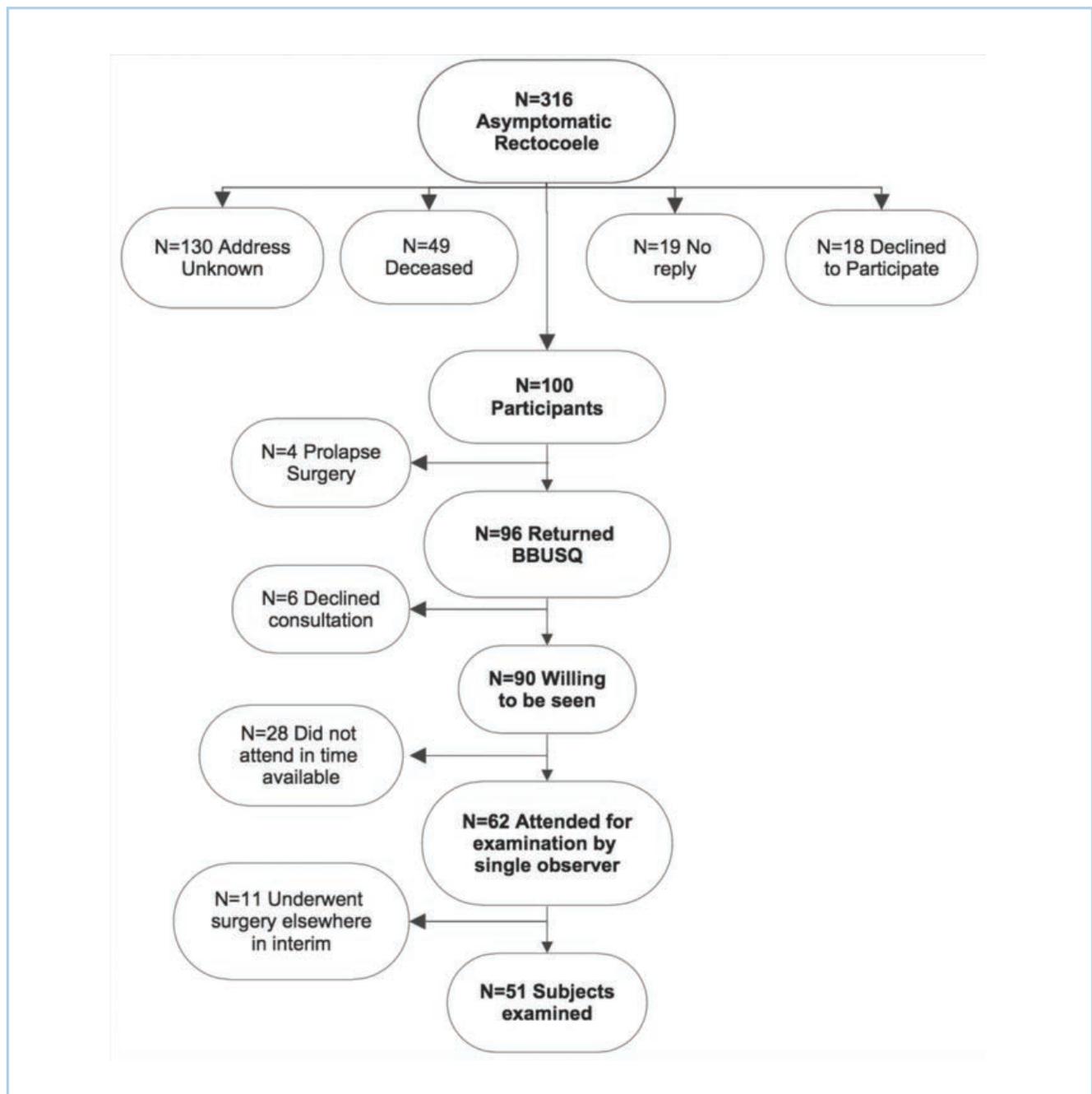
RESULTS

Of 316 consecutive women with asymptomatic rectocele seen during the eight years 1992-1999

and invited to take part in the review, 130 letters were returned "address unknown" and 18 declined to participate. After extensive enquiry over the intervening time, it was discovered that 49 women had died, and 19 women were alive but did not reply to written enquiries. Of the remaining 100 women, four had prolapse surgery elsewhere in the interim due to various urogynaecological symptoms and were not willing to attend for examination.

Of the 96 patients who returned the completed BBUSQ, six declined a further consultation. Of the 90 who consented to be reassessed, 62 (69%) attended and were examined (Figure 1). The remaining 28 were given at least two appointments and if they did not attend

Figure 1: Flow chart of patient recruitment



they were not contacted again because of concern regarding privacy. Of the 62 women who attended for reassessment, 11 were ineligible as they had undergone prolapse surgery elsewhere (thus details of isolated rectocele progression were unavailable). Of those 11 women who had surgery, two had noted constipation at the initial consultation.

The main complaint in the 51 participants at the first visit had been for: stress incontinence in 24 (47%), urge incontinence in 16 (31%), mixed incontinence in 10 (20%) and one woman reporting nocturia. The Baden-Walker Score for severity of asymptomatic rectocele at the first visit was mild (37/51, 72.5%) and moderate in the remainder (14/51, 27.5%). No participant with severe rectocele was asymptomatic.

For the 51 participants who were reassessed, the median (IQR) time from the first visit was 5.9 (5.1 to 7.3) years, with a range of 4.6 to 12 years. The median (IQR) age of the patients at the first assessment was 57 (46 to 65) years. A colposuspension had been performed in seven (13.7%) of the patients and one woman had a worsened but still asymptomatic rectocele.

For the 51 patients, the physical examination showed that the rectocele was worse in 20 (39%), unchanged in 22 (43%), and improved in nine (18%). All participants whose rectocele was unchanged or improved remained asymptomatic. Among the 20 women with worsened rectocele, 15 (75%) were also asymptomatic. As noted in Figure 1, a further 11 patients who attended for examination had received surgery so that 31/62 (50%) of women who attended either had physical examination evidence of a worsened rectocele or had surgery for a likely worsened rectocele.

When comparing participant scores where the rectocele was clinically worse with scores that had remained unchanged, neither age, BMI in the obese range, pelvic floor muscle training, or post-menopausal state appeared to be associated with a worsened rectocele. For those with no change or an improvement in the rectocele, the median (IQR)

age was 59 (51 to 65) years compared to those whose rectocele was worse, 49.5 (41 to 64) years; $p=0.06$. The median (IQR) BMI was slightly higher in the no change or improvement group, 27.4 (23.9 to 33.7) kg/m^2 compared to the worsened group, 24.6 (22.1 to 29.5) kg/m^2 , $p=0.046$.

Pelvic floor muscle training was recommended to the majority of participants (49/51, 96%) at their first visit. However, when asked if they were still performing these, only 2/51 (3.9%) said they were “sometimes” strengthening their pelvic floor muscle.

Topical or systemic oestrogen was used by 16/51 (31%) of participants at the first visit and 20 (39%) at the assessment visit. Of those 20 participants, the rectocele was the same or better in 11 and worse in nine. Regarding menopausal status, 16 of the 51 (31%) participants were pre-menopausal at their first visit and 10 were still pre-menopausal at follow-up. Of the 20 participants with a worse rectocele, four had become menopausal in the interim and six were still pre-menopausal.

Chronic cough affected 6/51 (12%) of participants at the first visit. A worse rectocele was present in 4/6 (67%) with chronic cough at baseline and 16/45 (36%), RR (95% CI) 1.9 (0.9 to 3.7), $p=0.31$.

Constipation affected 14/51 (27.4%) participants at the first visit. A worse rectocele developed in 4/14 (29%) of those with initial constipation (Figure 2) and 16/37 (43%) who had no initial constipation, RR (95% CI) 0.66 (0.3 to 1.6), $p=0.52$. New onset constipation affected 12/37 (32%) participants at follow-up. A worse rectocele developed in 6/12 (50%) of participants with new onset constipation at follow-up and 10/25 (40%) of participants without constipation at follow-up, RR (95% CI) 1.25 (0.6 to 2.6), $p=0.73$

Regarding evacuation scores on the BBUSQ, for those with the same or better rectocele (31/51), the median (IQR) score was 12.3 (4.2 to 16.7). For those whose rectocele was worse (20/51), the median (IQR) score was higher at 18.7 (8.2 to 23.7); $p=0.027$.

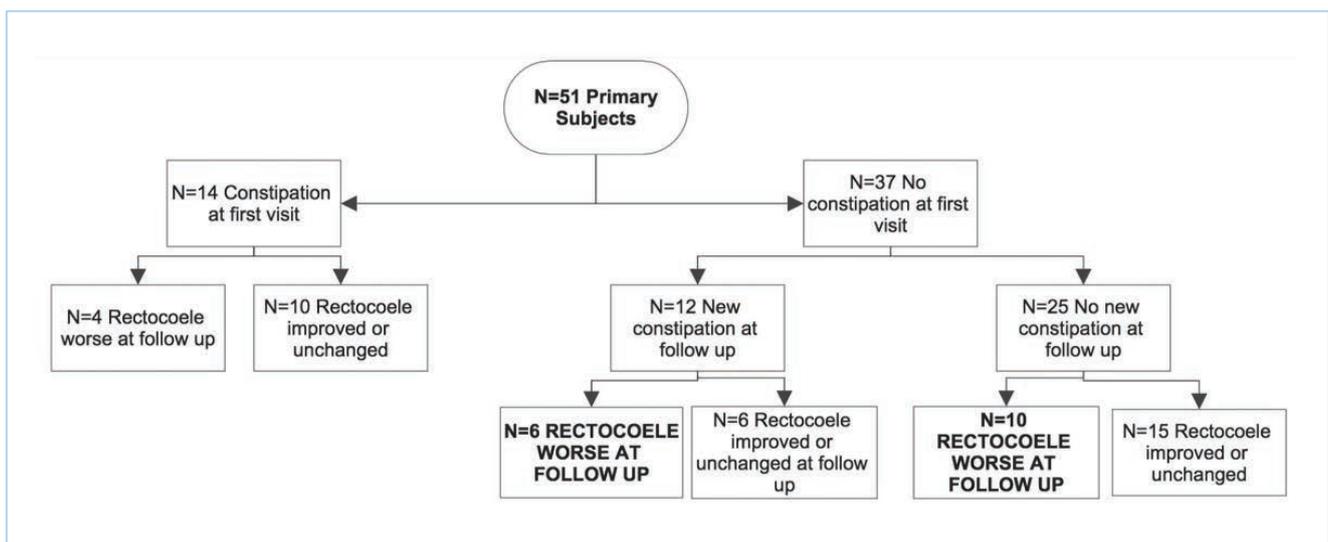


Figure 2: Constipation in relation to rectocele symptoms

DISCUSSION

In this study of asymptomatic rectocele involving systematic examination of 51 women by one observer at median 6 years, we were surprised to find that increasing age and BMI had no impact upon the likelihood of subsequent worsening of the rectocele. The lack of age effect may reflect the fact that our patient sample was middle-aged at the first visit (median 57 years); however, it agrees with the findings reported by Gilchrist and colleagues, who examined 64 women at 1.5 years⁶. Similarly, the BMI of our cohort was not high at the first visit (median BMI 25) so that a different sample cohort might yield different conclusions. Indeed, Kudish *et al.*⁴, in a study of 16,600 women post-menopause, reported the likelihood of any prolapse worsening at five years after diagnosis was 30–50% greater in overweight and obese women respectively.

Chronic cough did confer an increased relative risk but small numbers make this relationship worthy of further study (not yet pursued by other authors). Interestingly, constipation symptoms present at baseline did not appear to relate to the likelihood of worsening rectocele. The impact of new onset constipation upon rectocele progression over time requires a larger study.

We were disappointed by the attrition in numbers from the index period (1992–1999, n=100 participants) to the lower sample who came forward for examination in 2004 onwards (n=62). However, our city is a major port of entry for immigrants to this country and our population is known to be highly mobile. The small sample size increases the chance of a Type II error for association where clinically relevant differences may remain statistically undetected, as well as a Type I error of inflation where statistically significant associations may not be clinically relevant. Responder bias may also affect the reality of estimates of proportion because those who did not respond or attend may have different characteristics.

What are the broader implications of this study? Most gynaecologists would agree that if a prolapse causes symptoms, some management should be provided, even if only to recommend avoiding factors likely to worsen the condition and possibly physiotherapy to strengthen the pelvic floor muscles. Indeed, a large international trial (POPPY)¹⁰ has recently shown the benefit of physiotherapy intervention among women with a mild to moderate symptomatic prolapse. On the other hand, an asymptomatic prolapse poses a clinical dilemma. A cystocele that does not cause a feeling of “something coming down” in the vagina may, nevertheless, be associated with urinary incontinence or incomplete emptying and prompt a woman to seek treatment. A rectocele that does not cause a feeling of bulge in the vagina represents an area of uncertainty. So far as we are aware, this is the first publication showing that asymptomatic rectocele will undergo anatomical worsening in only 39–50% of women over a six-year period and that the majority of women (89.2%) will remain asymptomatic.

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A scoping study of paediatric continence service provision in the Great Southern region of Western Australia

ABSTRACT

The aim in conducting this cross-sectional study was to survey 100 parents of children in pre-primary and year one in the Great Southern region of Western Australia to determine the number of children with urinary incontinence and, of those, how many were receiving treatment. The severity and associated risk factors were also investigated. Permission was sought from schools to recruit parents of children starting primary school to complete an online survey. Social media was used to enhance response rates. The response rate was 100/1665 (6%) of the total target population, 100/925 (10.8%) of children from participating schools. Overall, 40% of responders reported daytime urinary incontinence. Of the children with daytime urinary incontinence, 26.3% experienced mild and 73.7% moderate-severe daytime urinary incontinence. No child was reported to have severe daytime urinary incontinence. Nocturnal enuresis was reported in 46.9% of those who responded and 89.8% of children suffered from at least one other lower urinary tract symptom. This study is significant as there are limited treatment options in regional Australia for paediatric daytime urinary incontinence. Only 23.7% of parents had sought medical treatment for their affected child. Further research is required to determine whether lack of parental awareness regarding the significance of incontinence and the availability of treatment services; or the lack of accessible services in regional and rural Australia is behind inadequate intervention for this condition. Larger sample sizes are required to accurately determine prevalence and to examine risk factors for daytime urinary incontinence in children.

Keywords: Diurnal enuresis, nocturnal enuresis, lower urinary tract symptoms, risk factors, children, regional Australia.

INTRODUCTION

The International Children's Continence Society (ICCS) defines urinary incontinence as the "involuntary leakage of urine"¹. Daytime urinary incontinence (DUI) is incontinence during the day, whereas nocturnal enuresis (NE) is incontinence only occurring during sleep¹. Children must be at least five years old in order to take into consideration the development of bladder control¹. The severity classification system described by Sureshkumar and colleagues² is used within this paper:

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Competing interest statement

The authors have declared they have no relevant relationships or circumstances that present actual or potential conflicts of interest.

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mild (at least once in the past six months); moderate-severe (at least twice or more per week); and severe (daily).

Recent reports suggest that DUI is common in children, with rates between 3.2% and 9%³. This is concerning, as childhood incontinence can be physically and emotionally distressing. If left untreated, urinary incontinence may be associated with increased prevalence of lower urinary tract dysfunction into adulthood⁴⁻⁶. Guilt, shame and low self-esteem have been reported in children aged between six and eight years old, with increased effects of incontinence among the younger male population⁴. Increased vulnerability to psychosocial disorders and the risk for continued lower urinary tract dysfunction into adulthood validate the notion that adequate management for urinary incontinence among school children is crucial⁵⁻⁷. The rate of NE is also well documented and is reported in 10% of children³. The rates for DUI and NE are based on international populations of children. Australian literature, on the other hand, reports a higher prevalence of DUI between 5.5% and 19.2%^{2,8}. However, these studies were based in metropolitan areas and do not reflect rural and regional populations, where nearly 30% of Australians live⁹.

As treatment availability for specialty services such as incontinence are often limited outside of major cities, we were concerned there may be a treatment gap in regional Australia between the number of children

suffering from incontinence and the number of children receiving treatment. Within the Great Southern area of Western Australia (WA), an NE clinic is available for children through the public health system; however, there is no similar service for children with DUI. There are limited services provided by a continence nurse for children with all types of incontinence through Albany Health Campus. Long waiting lists and isolated geographical location mean children suffering from urinary incontinence are at a disadvantage and families are required to travel five hours to the nearest paediatric tertiary institution or seek private medical treatment for specialist input. To understand this gap further, we investigated the number of children with incontinence versus the number receiving treatment, as well as the severity and associated risk factors for urinary incontinence, among entrance age school children within the rural and regional setting of the Great Southern region of WA.

METHODS

Parents of children enrolled in pre-primary and year one, and aged between five and seven years, in the Great Southern region of WA were invited to participate in an online questionnaire to determine the number of children with incontinence, those receiving treatment and the severity and risk factors associated with DUI. This cross-sectional study was performed



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Table 1: Demographic profile of respondents in the Great Southern area compared to the City of Albany profile of children aged 5 to 7

Demographic profile of 100 children in the Great Southern aged 5 to 7		City Albany population profile, ABS 2011 ¹¹	
Characteristic	n/100 (%)	Characteristic	%
Gender		Gender	
Male	42 (42)	Male	51-52
Female	56 (56)	Female	49-48
Missing	2 (2)		
Year of birth		Year of birth	
2007	4 (4)	2007	24
2008	18 (18)	2008	26
2009	40 (40)	2009	25
2010	38 (38)	2010	25
Home address		Home address (Great Southern)	
Regional centre	84 (84)	Urban	68
Rural	16 (16)	Rural	32
Family structure		Family structure	
Single parent	22 (22)	Single parent	27
Both parents	78 (78)	Both parents	73
Siblings		Siblings	
Single child	11 (11)	Single child	39
1-3 siblings	84 (84)	1-3 siblings	53
>3 siblings	5 (5)	>3 siblings	8
Income		Income	
<\$35,000	8 (8)	<\$35,000	40
\$35,000 to \$95,000	55 (55)	\$35,000 to \$95,000	41
>\$95,000	34 (34)	>\$95,000	19
Missing	3 (3)		
Father education		Education (person aged 15+)	
Non-tertiary	57 (57)	Non-tertiary	38
Tertiary	38 (38)	Tertiary	62
Missing	5 (5)		
Mother education			
Non-tertiary	49 (49)		
Tertiary	48 (48)		
Missing	3 (3)		

from July to September 2015. Ethics approval was granted from the Human Research Ethics Committee at Curtin University, the Department of Education of WA and the Catholic Education Office of WA.

The Great Southern health region covers 40,500 km² and is one of WA's nine regional areas¹⁰. All 44 schools within the Great Southern were contacted to determine the number of students enrolled in pre-primary or year one. There were 1665 children enrolled in pre-primary and year one within the region. All schools were provided detailed information regarding the study by email and assistance with participant recruitment was requested. A second email was distributed two weeks later to schools that did not respond to initial contact.

A total of 14 schools, with 925 pre-primary and year one students, responded indicating their willingness to assist with recruitment.

All participating schools were emailed a PDF advertisement with access to the questionnaire's electronic web link at the start of term. Schools were asked to publish the advertisement in the school newsletter, and distribute to parents via email. Some schools chose to provide details of the study to parents via the school's Facebook page. In an effort to maximise the response rate, a reminder email was sent to participating schools.

Initial contact with schools yielded a poor response, with only five surveys completed. In order to increase

Table 2: Number of children with DUI, NE and combined

Variable	Boys n/42(%)	Girls n/56(%)	All children n/100(%)
DUI			
Yes	17 (40.5)	23 (41.1)	40 (40.0)
No	25 (59.5)	33 (58.9)	60 (60.0)
Missing	1	1	-
NE in last 6 months			
Yes	*27 (67.5)	*18 (33.3)	45 (46.9)
No	13 (32.5)	36 (66.7)	51 (53.1)
Missing	2	2	4
Combined DUI and NE			
Yes	13 (31.7)	9 (16.4)	22 (22.4)
No	28 (68.3)	46 (83.6)	76 (77.5)
Missing	1	1	2

Key: Valid percentages (%) of column

*vP<0.05 for difference in proportions between boys and girls

the response rate, we used social media and word of mouth to further promote the study. Paper flyers with the web link to the questionnaire were posted to each participating school. Teachers of pre-primary and year one students were requested to individually hand these out to children to take home to parents.

Inclusion criteria were all male and female children, between the ages of five and seven years. As the questionnaire was only available in English, the inability of the parent or guardian to read or understand English was considered an exclusion factor. Only 0.5% of the population of the main regional centre were unable to speak English or did not speak English well; therefore, we estimate only eight children were potentially excluded for this reason¹¹. At the conclusion of data collection, 120 questionnaires were submitted. There were 20 responses excluded, with eight questionnaires left blank, two were from outside the Great Southern region and 10 children were too young for consideration, leaving 100 responses suitable for analysis.

The questionnaire

An online version of the Children's Questionnaire on Daytime Wetting was adapted for this study using the Curtin University Qualtrics program¹². This is a validated questionnaire and was previously used successfully to assess the prevalence of DUI in children starting school in Australia^{2,12}. Demographic information, family dynamics, family history, details of urinary symptoms of DUI, presence of other lower urinary tract symptoms (LUTS), health professional involvement, emotional stress and socio-economic status was obtained. To eliminate bias, we sought clarification regarding additional medical conditions that may contribute to DUI. This was relevant, as children with disabilities were not excluded from the study. The question regarding NE was also altered to

gain more specific information surrounding frequency of occurrence. The question related to income was modified to reflect CPI increases.

All participants were given details about the study and provided access to resources and services available to assist them with follow-up advice if needed. Prior to completing the questionnaire, parents were required to indicate their consent by clicking on an icon on the survey web page to participate in the study.

Statistical analysis

Descriptive statistics data were analysed using frequency distributions, and comparisons between variables were made using Chi-square tests. Univariate logistic regression was performed to identify possible risk factors. Covariate effects on DUI and NE outcomes were summarised using odds ratios and their 95% confidence intervals. P-values <0.05 were considered statistically significant. SPSS statistical software (version 22.0, IBM) was used to analyse the data.

RESULTS

Response rates

The questionnaire was returned for 100 children between the ages of five and seven. The response rate was 10.8% of children from participating schools, 6% of the total target population.

Sample characteristics

Of the 100 participants included in the analysis, 42 were boys and 56 girls. Children were between five and seven years of age, with year of birth ranging from 2007 to 2010. Only 5 parents reported their child had a medical condition that may contribute to incontinence. Table 1 compares the demographic profile of the City of

Table 3: LUTS in children with DUI, by gender and total rates in all children

Variable	Children with DUI			All children with/without DUI n/100 (%)
	Boys with DUI n/17 (%)	Girls with DUI n/23 (%)	All children with DUI n/40 (%)	
Hesitancy				
Yes	1 (6.3)	1 (4.5)	2 (5.3)	5 (5.2)
No	15 (93.8)	21 (95.5)	36 (94.7)	92 (94.8)
Missing	1	1	2	3
Urgency				
Yes	13 (81.3)	19 (86.4)	32 (84.2)	71 (74.0)
No	3 (18.8)	3 (13.6)	6 (15.8)	25 (26.0)
Missing	1	1	2	4
Dribbling				
Yes	2 (12.5)	3 (13.6)	5 (13.2)	5 (5.3)
No	14 (87.5)	19 (86.4)	33 (86.8)	90 (94.7)
Missing	1	1	2	5
Holding				
Yes	9 (56.3)	17 (77.3)	26 (68.4)	57 (59.4)
No	7 (43.8)	5 (22.7)	12 (31.6)	39 (40.6)
Missing	1	1	2	4
Frequency				
Yes	6 (37.5)	8 (36.4)	14 (36.8)	38 (39.2)
No	10 (62.5)	14 (63.6)	24 (63.2)	59 (60.8)
Missing	1	1	2	3
Dysuria				
Yes	2 (12.5)	3 (13.6)	5 (13.2)	16 (16.3)
No	14 (87.5)	19 (86.4)	33 (86.8)	82 (83.7)
Missing	1	1	2	2
Afraid to use toilet				
Yes	1 (6.3)	6 (27.3)	7 (18.4)	17 (17.5)
No	15 (93.8)	16 (72.7)	31 (81.6)	80 (82.5)
Missing	1	1	2	3
Afraid to use school toilet				
Yes	3 (18.8)	5 (22.7)	8 (21.1)	21 (21.9)
No	13 (81.3)	17 (77.3)	30 (78.9)	75 (78.1)
Missing	1	1	2	4
Urinary tract infection				
Yes	1 (6.3)	7 (31.8)	8 (21.1)	18 (18.4)
No	15 (93.8)	15 (68.2)	30 (78.9)	80 (81.6)
Missing	1	1	2	2

Albany, the major regional centre in the Great Southern of WA, to the demographic profile of the sample collected in the study¹¹.

Number, severity and associations

The proportion of children reporting DUI was 40% (95% CI 30.4 to 49.6) as shown in Table 2. Of the children with DUI, 73.7% (95% CI 65.07 to 82.33) had moderate–severe incontinence, with DUI twice or more per week. Mild incontinence was reported in 26.3% (95% CI 17.67 to 34.93), with DUI at least once in the last six months. None of the participants reported severe DUI (Figure 1).

Of those participants who reported DUI, 17 were born in 2010, 16 in 2009, 5 in 2008 and two in 2007. The youngest age group demonstrated the highest rate of DUI; however, the differences between age groups was not statistically significant (p=0.650).

DUI was not significantly different in boys 40.5% (95% CI 30.88 to 50.12) compared to girls 41.1% (95% CI 31.46 to 50.74) (p=0.560). However, moderate–severe DUI was more common in girls with 81.8% (95% CI 74.24 to 89.36) compared to 62.5% (95% CI 53.01 to 71.99) in boys, but this did not reach significance (p=0.168) (Figure 1).

Parents of nine children (23.7%) (95% CI 15.37 to 32.03) with DUI, including eight (17.8%) (95% CI 10.3 to 25.3) with both NE and DUI, had sought medical help. There was insufficient data to determine whether severity of incontinence was associated with the decision to seek medical help or not.

The overall proportion of children with NE was 46.9% (95% CI 37.12 to 56.68). It was significantly more common in boys n=27 (67.5%) than girls n=18 (33.3%) (p=0.001). Boys who had DUI were also significantly more likely to have NE, than girls with DUI (p=0.014). Of the children with NE, 9.4% (95% CI 3.68 to 15.12) reported bedwetting in the past week. Combined DUI and NE was reported by 22.9% (95% CI 14.66 to 31.14) overall. Four children (4.1%) (95%CI 0.21 to 7.99) had both DUI and NE in the last week. There were no significant associations between gender and combined incontinence.

LUTS were commonly reported among the entire sample with 89.8% (95% CI 83.87 to 95.73) of children reporting at least one LUTS (Table 3). There were no significant associations between DUI and LUTS. Additionally, there were no association between gender and children with DUI and LUTS. Moderate–severe DUI and LUTS including: dysuria, being afraid to use the toilet at home or school, urgency, holding postures, and post-micturition dribble were reported more commonly in girls than boys (Table 3), but this did not reach statistical significance.

Other variables investigated, including family structure, parental income and parental education, were not found to be significantly associated with the presence of DUI. In addition, there was no significant association between family history of incontinence and DUI. Distance from a regional centre did not correlate with DUI frequency or severity, and previous emotional

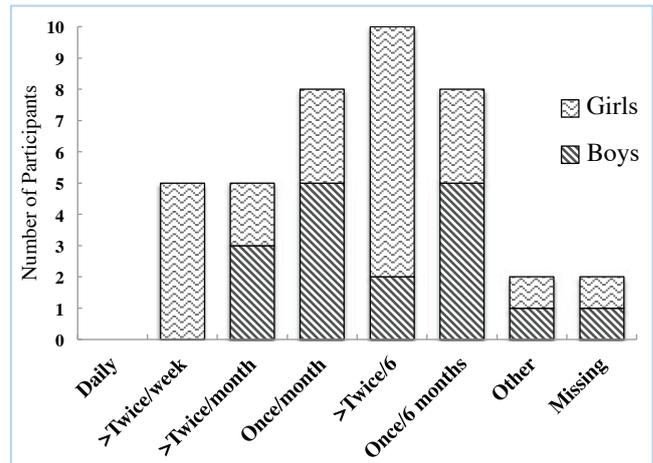


Figure 1: Frequency of DUI by gender

stress was not significantly associated with any form of incontinence.

DISCUSSION

The rate of incontinence in this sample of children from the Great Southern of WA was 40%. These results are higher than previously reported globally between 2.7% and 11%¹³⁻¹⁵ and nationally at 19.2%². This may be due to a number of factors, including reporting bias, as parents of children with incontinence may be more likely to return the incontinence questionnaire. Additionally, the questionnaire investigated episodes of incontinence at least once in the last six months, which is consistent with rates reported by Sureshkumar and colleagues², but differs other studies with shorter time frames^{14,16}. The children within this study were substantially younger and demonstrated higher rates of incontinence compared to other studies that included adolescents¹⁶⁻¹⁹. Due to a limited sample size, we were unable to determine whether distance from a regional centre in the Great Southern influenced the rate of DUI. Although the sample size in our study was small, the presence of DUI is still reported frequently in this population and these children need to be able to access treatment as needed. Further studies with larger sample sizes, and adequate power, are needed to accurately compare rural and regional rates of DUI with rates in metropolitan areas.

Similarly, higher rates of NE were reported by parents within our sample, with 46.9% of children with NE, and 22.4% reporting both day and night symptoms. Again, it is possible our study produced higher rates of DUI as incontinence was investigated over a longer duration, of six months. Despite common occurrence and findings demonstrating DUI to be the strongest predictor for NE, no significant association was found in our study¹⁹. This is perhaps due to our small sample size. In the present study, NE was reported weekly with a frequency of 9.4%. This is comparable with both international and national literature with prevalence demonstrated at 10% and 11% respectively^{2,3}. DUI and

NE are likely related and should both be assessed for in the child. Overall, the high number of children found to have NE indicates that it is an issue within the region. Current public health services for childhood incontinence are limited, with lengthy waiting periods; therefore, additional resources and treatment options are needed within the area.

While the rates of DUI and NE were both high in this study, there were differing results for gender associations within the two conditions. Despite no significant findings between DUI and gender, we found boys were significantly more likely than girls to suffer NE, with a ratio of 3:2. This finding was expected, as almost all other epidemiological literature investigating NE report similar results, with boys twice as likely to have NE than girls³. As well as identifying that NE is a problem among boys within the Great Southern population, our findings strengthen current available evidence for gender and NE globally.

We proposed a treatment gap between the number of children requiring treatment, compared to the number receiving treatment. We found this was the case, with only nine (23.7%) parents with children affected by DUI seeking help from a health professional. Sureshkumar and colleagues² report similar findings, noting 16% of families had sought help. It is possible this may be due to parents being unaware of the significance of the condition and availability of treatment services. Overall, fewer families sought medical help than would be expected, given the emotional and physical impacts of DUI^{4,20}. This may be representative of a population view that DUI is normal within this age group. We therefore recommend this gap is addressed by improving resources specifically to prevent and treat DUI in children of this age group with emphasis on parental education and targeted treatment surrounding the condition.

The number of participants reporting fear associated with the use of toilets was of particular interest and may be another area in need of targeted treatment. Parents reported that 17.5% and 21.9% of children were afraid to use the toilet and afraid to use school toilets, respectively. More than 15 years ago, Sureshkumar and colleagues² reported 15.7% of Australian children were fearful of school toilets, suggesting that management of this issue was unsatisfactory. The Continence Foundation of Australia currently produces a kit called "Toilet Tactics", which is a resource package designed for schools to use to raise awareness. Given the young age of children reporting fear associated with toilets, both at home and school, it may be necessary for further investigation into current resources and whether or not they are targeted at the suitable age group.

Finally, our study also investigated the potential relationship between DUI and inherited and acquired risk factors. Mild and moderate-severe DUI was not found to be significantly associated with any other variables. In our study, poor response rate and low sample size could explain the lack of significant findings. Other studies, with larger sample sizes have found independent risk factors for DUI were recent

emotional stress, paternal history of DUI, history of DUI among male siblings and low maternal education level^{2,18}. Before we can combat childhood incontinence it is important to understand the factors involved in development of the condition, and therefore more studies with higher power are required to examine the risk factors for DUI further.

We acknowledge the response rate for the study is low, and there is potential selection bias. However, the increased vulnerability to psychosocial disorders, and the risk for continued lower urinary tract dysfunction into adulthood, validates the notion that adequate management for urinary incontinence among school entrants is crucial. Results should be considered and ought to trigger a response among the community, policy makers and funding groups in the Great Southern and wider regional WA. It is anticipated that this study may help to raise awareness and also highlight the need for further research into the prevalence and impact of DUI and NE in regional Australia. Investigations into the capacity of the health care system in the Great Southern region, regarding assessment and management of this group of patients, is also recommended. In future research, changes to the methodology such as a longer recruitment phase, increased accessibility and promotion of the study to parents could enhance recruitment. This could be achieved by attending sporting and community events with a tablet computer for ease of access to the questionnaire. In addition, educational presentations to parents' and citizens' associations and increased exposure of the study through social media could also assist with recruitment; increasing sample size which could, in turn, strengthen results.

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Development of a long-form screening tool to identify clinically relevant co-morbidities of nocturia

ABSTRACT

There are significant interactions between voiding at night and metabolic, cardiovascular, hormonal, mental health, sleep and inflammatory changes that flag nocturia as a likely marker of co-morbid medical conditions. The causal pathway of nocturia is multifactorial and differs between patients. However, there is currently no clinical tool to capture information about all-cause pathophysiology underlying nocturia. The aim of this study was to develop a comprehensive, multidisciplinary assessment metric to identify potential and co-existing causes of nocturia. Validated and reliable tools measuring co-morbidities were collected and discriminating items in each tool identified. A 57-item questionnaire was developed and pertinent clinical measures were added. The TANGO (Targeting aetiology of nocturia guides outcomes) Long-Form was piloted in individuals for feedback about the completion process. The tool was revised to 56 items and piloted in the clinical setting prior to use in data collection. The index question for the new metric established the frequency of nocturia at night, and bother this caused. Significant risk factors for nocturia >1 per night and items from validated metrics capturing these variables followed. Demographic details relating to age, gender, work status, living arrangements and the number of years of education and training were added, along with a medical checklist. Six physical measures were identified. Psychometric testing is under way in five patient cohorts, with the aim of generating a TANGO Short-Form. Reliability testing is then planned.

Keywords: Nocturia, causality, screening tool, pilot project.

BACKGROUND

Voiding at night is a symptom of systemic disease and commonly co-exists with poorly controlled diabetes, impaired circulation, congestive heart failure, metabolic syndrome, anxiety, autonomic dysfunction, airway occlusion during sleep and renal and malignant disease¹⁻³. Unmanaged nocturia has significant morbidity and is associated with impaired general health and up to a threefold use of health care services^{4,5}. In fact, individuals with more than two nocturia episodes per night have an odds ratio of 4.42 for cardiovascular or cerebrovascular morbidity and double the risk of early death¹. Other significant health risks include compromised glucose homeostasis, reduced nocturnal plasma melatonin levels, increased catecholamine levels and a higher risk of using sedatives^{6,7}.

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Competing interest statement

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The causal pathway of nocturia is multifactorial and differs between patients⁹. Blood pressure changes, cardiac dysfunction, fluid shift into the lower limbs, polyuria, sleep apnoea, insomnia, pharmacotherapy, polypharmacy and lower urinary tract symptoms can all underlie nocturia. Multiple causes may co-exist within one patient. Previous data suggests that individual causes are unlikely to be sufficient or necessary to produce nocturia⁹. No single factor will always cause nocturia and there are likely to be multiple “backdoor” causal pathways⁹. Waking to void at night may be co-morbid with poor health and represent an interaction of causes.

The symptom of nocturia is encountered, but not necessarily recognised as problematic, across medical specialities. Although causal pathophysiology crosses disciplinary borders, a symptom-specific diagnostic pathway and targeted treatment approach is lacking¹⁰. This may explain the finding that patients with lower urinary tract symptoms who respond to treatment generally report only a modest reduction in nocturia episodes. One study suggests this does not differ appreciably from placebo¹⁰.

Given that patients themselves often do not recognise the significance of nocturia, perceiving it as a nuisance but not a medical issue, the first step in effective management involves screening for the symptom. Based on understanding the wide-ranging causality of nocturia, this process should include evaluating health issues traditionally beyond the scope of lower urinary tract symptomatology. The aim of this study is to present the methodology underlying development of a screening metric “Targeting aetiology of nocturia guides outcomes” (TANGO) for identifying all causes of nocturia in individual patients.

METHODS

A literature search was undertaken to identify studies describing the relationships between nocturia of >1 per night and markers of poor health. Inclusion criteria were individuals 60 years or older with nocturia and one or more of the following disorders: polyuria, postural blood pressure change, hypertension, cardiac dysfunction, cardiovascular disease, diabetes, anxiety, depression, cognitive impairment, polypharmacy, sleep disturbance, sleep disorder, apnoea, lower urinary tract symptoms, inflammation or falling. The associated risk ratios were identified and have previously been reported⁹.

An expert panel process was instituted to seek guidance in identifying validated and reliable patient-completed instruments that captured the presence of variables significantly associated with nocturia. Given that retaining all the separate validated measures in the new tool was unrealistic, a clinical judgement discrimination process was undertaken. Each measure was closely investigated to identify items that were of important clinical interest or could be considered key discriminators of different factors. Items that were non-specific or duplicated in other tools were

not endorsed. Discriminating items for each symptom were thus identified and retained in the item bank. Clinical measures indicative of associated risk factors were identified and similarly scrutinised.

A TANGO Long Form (TANGO L-F) was constructed from the item bank under the headings of details or questions about “yourself”, “your general health and mobility”, “your sleep habits”, “medical issues”, “bladder habits” and “your general mood”. These sections were designed to be self-completed by individuals with nocturia \geq once per night. Discriminating measures were identified and added to the end of the TANGO L-F for collection by health care staff prior to attendance at scheduled appointments.

The tool was piloted on 20 individuals who were representative of the eventual sample population. Specific feedback was sought about the general tone, format and layout of the instrument, any difficulties in comprehension or recall of information sought, appropriateness of response options, any repetition, time burden for completion and willingness to complete the questionnaire with and without incentives for doing so^{11,12}. Individuals who piloted the questionnaire were told that their answers would not be scrutinised or recorded. TANGO L-F was then modified to incorporate feedback from the pilot process. The final version of TANGO L-F was administered to five individuals attending our service who completed it while “thinking aloud” with a member of the study team.

In order to understand the prevalence and associated bother of nocturia in our clinical population, an audit was conducted. Consecutive patients in two outpatient clinics were asked to self-complete five questions by selecting the best response given for the items: 1) How often do you wake at night to pass urine? 2) How much are you bothered by waking at night to pass urine? 3) Do you require an interpreter to read English? 4) Age; and 5) Gender. In addition, a spot-audit of nocturia frequency was performed by nursing staff on one geriatric hospital ward in our institution.

RESULTS

Our previous work reported that the greatest risks attached to frequent nocturia were in women with disordered breathing at night, individuals either using sedative hypnotics or complaining of secondary insomnia who also reported falls, women with a poor health status, where anxiety or impaired cognition were co-morbid, co-existing restless leg syndrome and secondary insomnia, and men with elevated inflammatory markers⁹. In addition, there was evidence to support identification of age, gender, work status, education level, specific ethnicities, regular exercise or physical activity, smoking status, active arthritis, walking speed and body circumference measures.

Table 1 summarises the validated metrics we identified to potentially capture the presence of variables shown to be significantly associated with nocturia and notes symptoms that should either be incorporated into checklists or physically measured. The index question

Table 1: Summary of capture of key variables known to be significantly associated with nocturia.

	Validated tool identified	Checklist item	Physical item
MENTAL HEALTH			
Cognition	GPCOG		
Anxiety	HADS Anxiety subscale		
Depression	HADS Depression subscale		
Education level		✓	
CARDIOVASCULAR			
Lower limb swelling		✓	
Cardiac disease		✓	
Systolic blood pressure		✓	✓
Postural hypotension			✓
Resting heart rate			✓
METABOLIC			
Diabetes risk	AUSDRIK		
Waist circumference			✓
Hip circumference			✓
Weight and height			✓
DM-risk ethnicity		✓	
Liver disease		✓	
Smoking status		✓	
URINARY TRACT			
Lower urinary tract symptoms	OABSS; IPSS; CLSS		
Nocturia bother	ICIQ-N		
Kidney disease		✓	
INFLAMMATION			
Arthritis	PASE symptoms sub score		
Pain	EQ-5D		
Malignancy history		✓	
Multiple sclerosis		✓	
Parkinson's disease		✓	
FALLS HISTORY			
Falls frequency		✓	
Fall-related injury		✓	
Walking speed			TUG
HEALTH STATUS			
Health-related quality of life	EQ-5D		
Mobility	EQ-5D		
General health	SF-36 QoL item		
MEDICATION			
Anti-depressant		✓	
Anti-hypertensive		✓	
Sedative at night		✓	
Anti-diuretic		✓	
Hormones		✓	
Steroids		✓	
SLEEP			
Sleep quality	Epworth SS; PSQI; BPI(SF)		
Insomnia	ISE		
Secondary insomnia	ISE		
Disordered breathing	STOP-Bang		
Neck circumference			✓
Snoring	STOP-Bang		
Restless leg syndrome		✓	

GPCOG: General Practitioner Cognitive Screening Test
 HADS: Hospital Anxiety and Depression Scale
 AUSDRIK: Australian Diabetes Risk Assessment Tool
 OABSS: Overactive Bladder Symptoms Score
 IPSS: International Prostatism Symptom Score
 CLSS: Core Lower Urinary Tract Symptom Score
 ICIQ-N: International Consultation on Continence Modular Questionnaire – Nocturia
 PASE: Psoriatic Arthritis Screening and Evaluation Questionnaire
 EQ-5D: European Quality of Life – 5 Dimensions
 TUG: Timed Up and Go Test
 SF-36: Short Form 36 Health Survey Questionnaire
 Epworth SS: Epworth Sleepiness Scale
 PSQI: Pittsburgh Sleep Quality Index
 BPI (SF): Brief Pain Inventory (Short Form)
 ISE: Insomnia Severity Index
 STOP-Bang: STOP-Bang Screening Questionnaire for Obstructive Sleep Apnoea

Table 2: Prevalence of nocturia when considered by frequency of episodes.

	Continence clinic n/88 (%)	Sleep clinic n/55 (%)	Aged care ward n/18 (%)
International Continence Society definition of nocturia = 1 void/night	82 (93.2)	48 (87.3)	14 (77.7)
Clinical definition of nocturia: > 1 void/night	52 (59)	26 (47)	12 (66)

for the new metric established the frequency of nocturia at night, and was succeeded by a rating of the bother this caused. Essential demographic details included age, gender, work status, living arrangements and the number of years of education and training.

After removal of item duplication and non-discriminating questions, the long form tool comprised 57 questions and 10 clinical measures. TANGO L-F was then formatted under headings which were each introduced with a single sentence. The pilot cohort consisted of 10 males and 10 females, who ranged in age from 40 to 78 years (mean age of 51.7 years) and were all known to members of the study team. Feedback received from the pilot process included suggestions for simplifying specific wording, alternative ways to convey concepts, identification of ambiguity and suggestions to avoid repetition. Appendix 1 details responses to guided feedback. The time burden for completion ranged from seven to 15 minutes, with a mean requirement of 10.5 minutes. After incorporation of feedback, the TANGO L-F was reduced to 56 self-completed items. Participants did not endorse the initiative of incentivising questionnaire completion and recommended offering a coffee or small, clinically relevant token only. Pilot testing of the final version of TANGO L-F included cognitive interviewing of five individuals who completed the questionnaire. The process revealed no further issues with the measure.

Audit data was available for 161 patients (18 aged-care in-patients, 88 continence and 55 sleep disorder outpatients). Table 2 shows the prevalence of mild and more serious nocturia in these patients. Severity of nocturia, as compared between the two clinical cohorts in Table 3, shows the median number of voids at night to be one for the sleep disorders and two for

the continence cohorts respectively.

Figure 1 shows that increasing frequency of nocturia was associated with incremental age in the patients attending the continence outpatient clinic. However, the association was not linear in patients attending the sleep disorder clinic. Figure 2 shows the burden expressed by clinic patients with respect to the frequency of nocturia.

Our audit was performed in a sample of convenience where the overall gender breakdown was similar (male 52%, female 48%). Women predominated in the continence clinic cohort (61%) and men in the sleep disorder clinic cohort (67%). Figures 3 and 4 summarise the frequency of nocturia by gender in each of the clinic cohorts. A substantial number of respondents required an interpreter at their clinic appointment: 19/88 continence (21.5%) and 6/55 sleep (11%) patients.

DISCUSSION

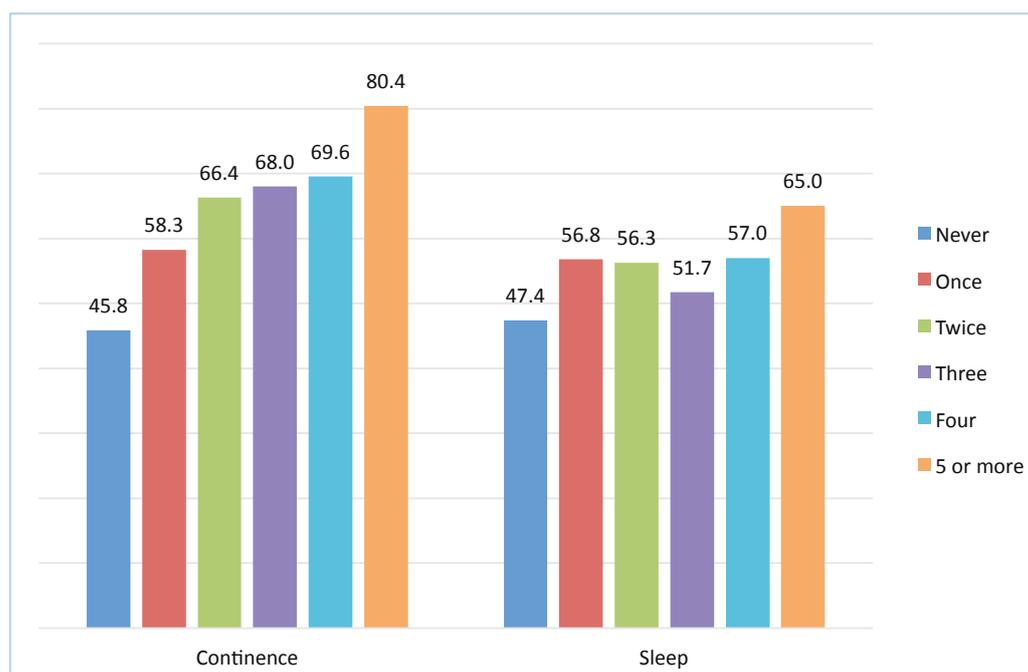
To our knowledge, this is the first step towards a multifactorial baseline assessment of multiple causes of nocturia as a coincidental disclosure or presenting symptom. Until now, individual clinicians would verbally screen for likely contributing factors, which in lower urinary tract services might be related to lower limb oedema, bladder overactivity, impaired voiding mechanics and polyuria causes. In developing this initial tool we have pulled together potentially important discriminating questions from individual specialities across the breadth of nocturia causality and compiled a patient-completed screening tool.

The process involved experts from within each of the represented disciplines identifying validated specialty-specific measures routinely used in clinical practice with

Table 3: Comparison of prevalence of nocturia between clinical cohorts

Frequency of nocturia/night	Continence clinic n/88 (%)	Sleep clinic n/55 (%)
0	6 (6.8)	7 (12.7)
1	30 (34)	22 (40)
2	20 (22.7)	12 (22)
3	18 (20.4)	7 (12.7)
4	9 (10.2)	5 (9)
≥5	5 (5.6)	2 (3.6)

Figure 1: Mean age of responders when considered by both the severity of nocturia and the clinical cohort



patients presenting with key pathologies. The Royal Melbourne Hospital is a large institution and we were able to interest experts from eight different clinical areas in the development process. Working parties identified 15 tools, each specific to a possible aetiology of nocturia. These tools were then scrutinised to identify items with poor discrimination for nocturia. Remaining items were added to the TANGO L-F. Repetition was identified during the pilot process, particularly in the sleep metrics, and addressed with a second round of expert consultation.

In order to begin formatting the tool to provide easy feedback to clinicians, items were grouped under dysfunction headings. As can be seen in Table 1, relevant diagnostic information was also organised in checklists and as clinical measures. We acknowledge that in its current format this long-form tool is not visually easy for clinicians to interpret. However, the tool is in development and will now undergo psychometric testing to further reduce the number of clinically relevant items. We aim to collect 300 patient-completed questionnaires and to scrutinise the endorsement of each of the 56 items. Based on frequency of endorsement, and considering any differences in response in each of the three patient cohorts, items will either be retained in the short-form tool or discarded. As per usual practice, the TANGO Short Form will undergo reliability testing and procedures to establish validity.

One of the difficulties with validating a tool for nocturia is quantifying the construct of voiding at night. Both the number of voids, as well as the amount passed, is implicated in describing the severity of the symptom. Internal validity of the definitive measure is likely to be influenced by different phenotypes of nocturia that we expect to identify in the various clinical cohorts. External validity may be assisted by the wide sampling

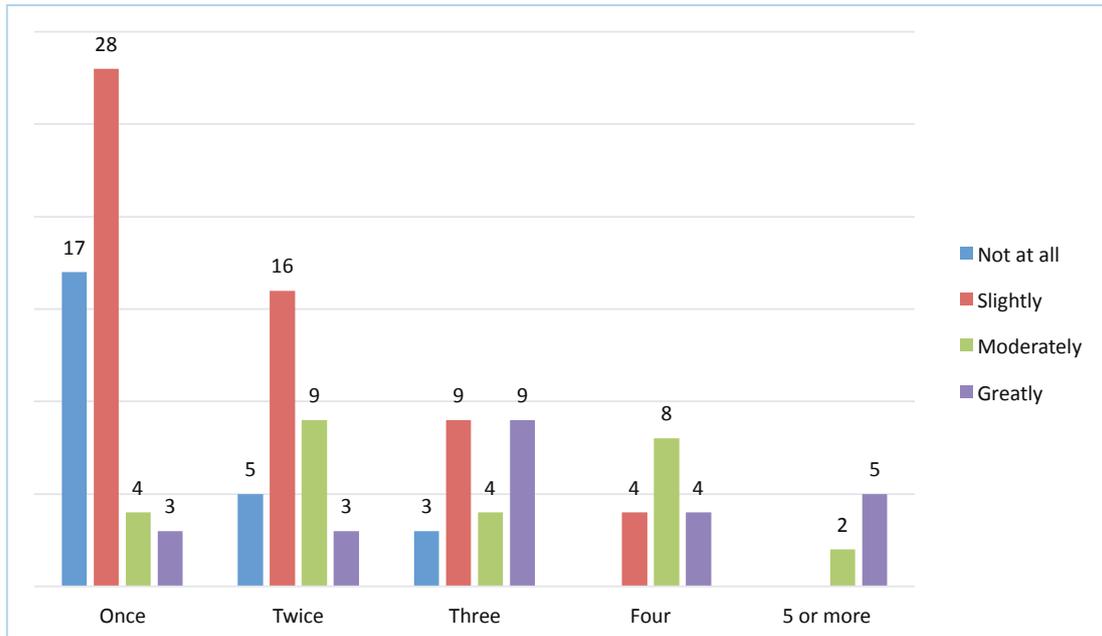
from different patient groups; however, given that the tool will be developed within an outpatient hospital setting, further testing may be required for application within a primary care context.

Findings from our prevalence audit were broadly in agreement with published rates of nocturia within the community. In a pooled analysis, nocturia once per night was noted in up to 93% of men older than 70 years and in up to 77% of similar aged women¹³. Our study participants who reported nocturia once per night were younger, having a mean age of 57 years. We noted a 93% prevalence of nocturia in our continence clinic cohort, with an even spread between men and women. The overall prevalence of waking once per night was 87% in participants from the sleep disorder clinic, with twice as many men as women represented.

Arising twice or more per night to void has been reported in around 60% of both men and women with little gender difference¹³. Our findings were similar in the continence clinic cohort (59%) but lower in the sleep disorder clinic sample (47%). The gender breakdown of more severe nocturia showed twice as many women as men having more than one episode of nocturia in the continence cohort. This ratio was maintained for three or more voids per night. This finding is interesting, given that within the literature on lower urinary tract conditions in men, nocturia is often assumed to be associated with prostatic enlargement. Conversely, in the sleep disorder clinic cohort, all levels of severity of nocturia were more prevalent in men than women. Although this may simply reflect clinical demographics, we anticipate being able to explore the possibility of different phenotypes in clinical cohorts in the data being collected for the short-form analysis.

As a practical issue that will need to be addressed in upcoming data collection with TANGO L-F, we

Figure 2: Burden of nocturia when considered by the frequency of waking to void



audited the need for interpreter services in our clinical cohorts. Close to one-quarter of continence clinic respondents currently use an interpreter at their appointments, while only 11% of patients from the sleep disorders clinic require this assistance. From a data collection perspective we will need to provide a home-completion option, where family members can help the respondent, or build questionnaire time into interpreter bookings.

The implications of this study are that patients who report nocturia can be comprehensively evaluated for multiple co-existing causes traditionally beyond the scope of lower urinary tract symptomatology. Nocturia

related to cardiovascular and metabolic status, blood pressure profile, fluid shift into the lower limbs, sleep apnoea and insomnia, mental health disorders and related pharmacotherapy, immune suppression, autonomic dysfunction, cognition and polypharmacy, falls and fall-related injuries can be easily identified. Future work will include development of a parallel comprehensive intervention bank matched to health issues identified in TANGO Short-Form. Clinicians will be able to build a care bundle to address potentially modifiable risks related to nocturia. Such work would theoretically improve practice and outcomes associated with current patient care.

Figure 3: Gender of responders when considered by the severity of nocturia in continence patients

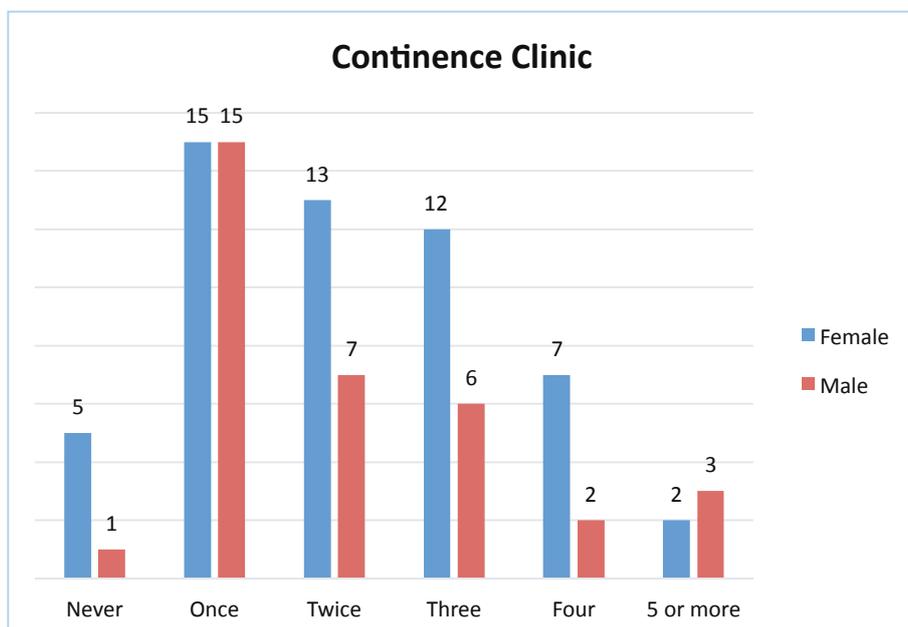
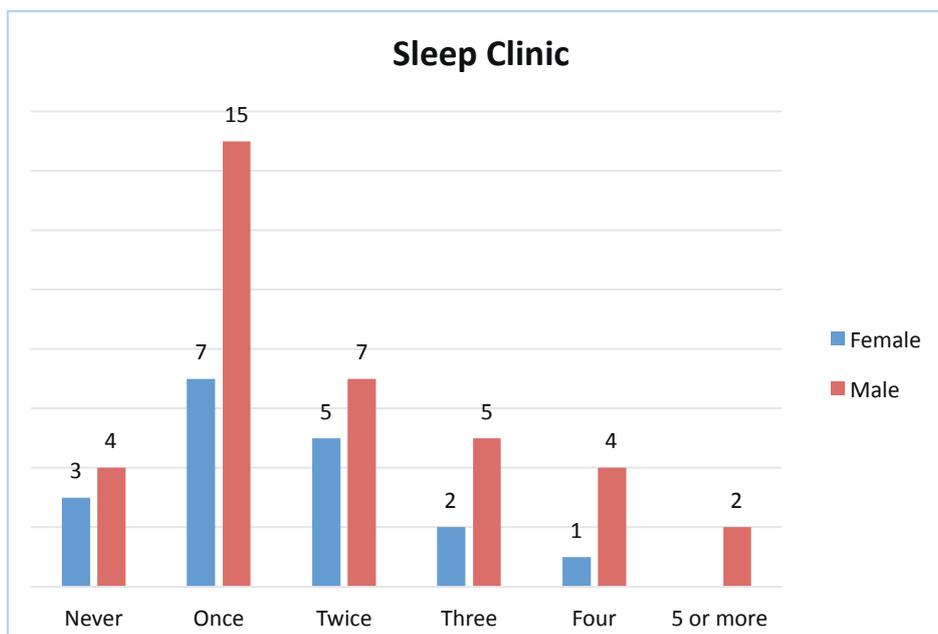


Figure 4: Gender of responders when considered by the severity of nocturia in sleep disorder patients



APPENDIX: SUMMARY OF FEEDBACK FROM PILOT OF TANGO L-F

General format:

- Easy to read and understand/easy to follow
- Simple and easy to understand
- OK
- Bigger font preferred
- Use more dot points, especially for information about returning questionnaire
- It makes sense
- Long and wordy
- Long but easy to answer. Comprehensive but doesn't drain the person answering the questions
- Subheadings are good

Layout:

- Quite legible, simple and easy
- Straightforward
- Good layout
- OK
- Need text boxes or more options in some places

Tone of instructions:

- Appropriate/absolutely appropriate
- Did not like personal question about education level
- Very good

Questions difficult to understand:

- No
- Quite fine

Repetition:

- None/No
- Vague but not annoying
- Not really
- Yes
- Yes but not too bad
- Yes and it was annoying
- Not annoying

Incentive needed for completion:

- No
- Perhaps a cup of coffee/coffee voucher a good idea
- Small token such as mouthwash sample
- Coffee please

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NURSING UPDATE

Continence Nurses Society Australia Who are we and what do we do?

In 1991, the Australian Nurses for Continence (ANFC) was established to be the national voice for continence nurses throughout Australia. Continence nursing special interest groups had evolved in Australian states and territories and a national organisation was seen to be important to connect and strength these continence nurses groups. In 2012, ANFC underwent a name change to the Continence Nurses Society Australia (CoNSA) and became incorporated in 2014.

CoNSA members work in diverse roles, in remote, rural, regional and metropolitan areas of Australia to provide specialist advice to individuals with incontinence and bladder and bowel dysfunction across the lifespan. Continence nurses are nurses who have a specialist knowledge and skill in continence care.

Membership to CoNSA allows continence nurses to be connected to like-minded nurses. We have a strong focus at a state level on education and support for our members. At a national level, we focus on championing the role of the continence nurse, providing standards for practice, promoting continence nursing and being a voice for issues that impact on continence nurses throughout Australia.

The aims of CoNSA are to:

- Represent the interests of nurses and midwives in continence care
- Promote and advocate the role of specialist continence nurse

Nominations sought for Peer-Review Panel

Experts from the disciplines involved in continence treatment, management and promotion and those who are expert in research methods and statistical analysis are invited to nominate to join the *Australian and New Zealand Continence Journal* Peer-Review Panel.

The journal is proud to promote Australian and New Zealand scholarship in the area of continence.

For details regarding the Peer-Review Panel, please email Jacinta Miller journal@continence.org.au

- Develop, share and sustain quality governance processes that can be used by all organisations with a continence service
- Provide a comprehensive and useful information sharing service to members
- Develop positive and productive relationships with all levels of government and non-government organisations, industry, professional and consumer organisations
- Promote and disseminate evidence-based continence care that places the person with continence needs and their family at the centre of the care
- Advocate for people with incontinence and other bladder and bowel concerns, their families, carers and unregulated workers
- Provide, support and promote professional, ongoing education on continence care
- Contribute to policy on continence care
- Promote research that will contribute to evidence-based practice for continence care.

Membership to CoNSA is through the state- and territory-based branches of CoNSA, namely:

- NSW & ACT: CoNSA, New South Wales Branch Inc
- QLD: CoNSA, Queensland Branch Inc
- Vic & Tas: CoNSA, Victorian and Tasmanian Branch
- SA, NT, & WA: CoNSA, South Australian, Northern Territory and Western Australian Branch Inc

CoNSA's website — www.consa.org.au — has details on how to become a member of CoNSA as well as information on the activities of CoNSA.

CoNSA is not part of the Continence Foundation of Australia (CFA). However, the majority of CoNSA members are also members of the CFA. CoNSA and CFA are supportive of each other and work collaboratively together. CoNSA values our strong relationship with the CFA.

If you are a continence nurse in Australia, please consider joining CoNSA if you are not already a member.

Janie Thompson
President, CoNSA National

News

AUSTRALIAN NEWS

World Continence Week 20–26 June

Preparations are well under way for World Continence Week, to be held 20–26 June. This year's theme, *Improve your bottom line*, encourages people to adopt healthy bladder and bowel habits to prevent and improve incontinence. During World Continence Week we will launch the Foundation's new project; *Finding the answers: improving access to continence information*, which aims to improve accessibility to Continence Foundation resources for people who have low literacy or a disability and their carers.

The launch will be held at Fenix in Richmond, Melbourne, on Friday 17 June. Those interested in attending can register online at continence.org.au/wcw

Members and organisations can also support World Continence Week by holding promotional events for consumers or colleagues. The Continence Foundation has free promotional resources available to assist all activities, including a new double-sided A3 poster. All resources can be ordered online, or by returning the order form you recently received in the mail.

Members who hold promotional activities have the chance to win free registration to the 25th National Conference on Incontinence, including a return economy airfare for the top prize. Go to continence.org.au/wcw to read more and download the World Continence Week Promotion Competition entry form.

New resources

Four new Easy English fact sheets have been developed for people with low literacy, or a disability, as part of the Foundation's special project, *Finding the answers: improving access to continence information*

The four titles are: *How to improve your bladder control*, *How to improve your bowel control*, *Healthy bladder and bowel habits*, and *Pelvic floor exercises* will be launched ahead of World Continence Week, and will be available for download from the website. These resources will also prove an invaluable tool for clinicians working with the one in four Australians with low literacy skills.

In response to the needs of people with a disability for online accessibility, the Foundation is optimising its website for people using assistive technology, including improvements in navigation and the installation ReadSpeaker software, which reads the text aloud for people with vision impairments. To improve access for people with hearing impairments, closed captions have been added to all videos.

Adelaide 2016 conference

Preparations for the 25th National Conference on Incontinence are progressing well, with a wide range of keynote speakers engaged to present at the conference, to be held at Adelaide Conference Centre, 9–12 November.

International speakers include Ian Milson from Sweden's Gothenburg University; Alexander von Gontard, Saarland University Hospital, Homburg, Germany; Katherine Moore from the University of Alberta, Canada; Elizabeth Mueller from Loyola University Medical Centre in Illinois, USA; and Rebekah Das, formerly from the University of South Australia, and now based in India.

Registration for the conference opens mid-June and can be completed online, by fax and by post. More registration and conference program details can be viewed at continence.org.au/national-conference

The winner of 2016 Continence Carer of the Year award will again be announced at the conference gala dinner. The Continence Carer of the Year award, sponsored by Hartmann, acknowledges the important but often overlooked role of at-home carers who deal with the complex role of caring for someone with incontinence. Members are invited to nominate those they believe deserve special acknowledgement for their care and dedication. Applications close on Friday 16 September and are available at: continence.org.au/carer-of-the-year

ABF research grants round opens

The Australian Bladder Foundation (ABF) grants round has opened. Grants are available to members of the Continence Foundation and aim to support advances in knowledge providing direct, tangible benefits in early prevention, detection and management of bladder and bowel dysfunction.

Applications close on 9 September 2016. The ABF Advisory Committee, endorsed by the trustees of the ABF, will review the applications for scientific merit.

To apply, go to continence.org.au/ABF. For further enquiries email: research@continence.org.au or phone 03 9347 2522.

Bilingual resources

Two new languages have been added to the Continence Foundation's suite of multilingual resources. Website videos and bilingual resources are now available in Japanese and Burmese, bringing the total number of language resources, including English, to 30. Go to continence.org.au/other-languages

Carers project

A new video providing practical caring tips at home is available on the carers' section of the Continence Foundation website. The video outlines how some of the functional issues affect continence, such as mobility, transfers and motor control, as well as focusing on ways to improve access to the toilet and toilet alternatives.

Other videos available on the carer web page feature information on continence products, dementia and toilet behaviour, and skin care.

Two further videos are in production, focusing on travelling tips when caring for someone with incontinence; and toilet strategies when caring for a child or young adult with a developmental disability.

ACE experts

Next month's Ask the Expert on the Australian Continence Exchange (ACE) will be Dr Tee Juan Ong, a Royal Melbourne Hospital geriatrician, who will discuss issues regarding multiple sclerosis and incontinence.

Specialist continence and women's health physiotherapist Shan Morrison will be our featured expert during August, addressing prostate and pelvic floor muscle exercises.

Australian New Zealand Continence Journal 2013 editions are now available for download on the ACE website, continenceexchange.org.au



Rowan Cockerell
CEO CFA

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The Helpline is funded under the Australian Government's National Continence Program and managed by the Continence Foundation of Australia



NEW ZEALAND NEWS

Education

An adult continence education day was held in Auckland on 8 April. It had full attendance and the best feedback of any day we have held. The subjects covered were: new options in treating stress incontinence; tibial nerve neuro-modulation; management of recurrent urinary tract infections that included information on a new vaccine; overactive bladder; the National Institute for Health and Care Excellence (NICE) contextualisation; Interstim® therapy; new continence prostheses, including those for men; and new research in the use of OnabotulinumtoxinA injection to treat overactive bladder in continence management.

We have several more days planned for later in the year and we encourage you to consider attending as it is so important to keep ahead of new developments.

World Continence Week

Our focus this year is on women of all ages. This will also incorporate Pelvic Floor — Safe Exercise. We launch our first “Pelvic Floor Focus” workshop in Christchurch on 2 September for exercise professionals. This will be promoted by Exercise NZ and REPS. REPS has awarded it 5 CPD points.

We had a photo shoot in April and the photographs will feature women at four different stages of life. This will form the basis of our poster and images will also be used on our website.

Thank you to all who took part in our “Continence Services Survey”. The report will be several months away as we will contract a person with specialised expertise to write it up to ensure that it gets the attention it deserves.

Please let the association know when there are planned education days being held in the community so we can send you information pamphlets and resources to give out. To order these, email zoe@continence.org.nz



Jan Zander
CEO NZCA

THE CONTINENCE FOUNDATION OF AUSTRALIA GRATEFULLY ACKNOWLEDGES OUR 2015 CONFERENCE SPONSORS

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Calendar of events 2016

13-17 June

Asia-Pacific Association of Gynecologic Endoscopy and Minimally Invasive Therapy (APAGE) Regional Conference
Singapore
Web: <http://www.apage-sg.com.sg>

30 June - 2 July

ICCS 2016 Annual Meeting
Kyoto, Japan
Web: <http://i-c-c-s.org/events/>

15-16 July

Australian Gynaecological Endoscopy & Surgery (AGES) Pelvic Floor Symposium
Grand Hyatt, Melbourne, VIC, Australia
Web: <http://ages-pfs-16.w.yrd.currinda.com/>

28-30 July

Australian Society for Psychosocial Obstetrics & Gynaecology (ASPOG)
Hotel Grand Chancellor, Hobart, TAS, Australia
Web: <http://www.aspog.org.au>

2-4 August

IUGA 41st Annual Meeting
Cape Town, South Africa
Web: www.iuga.org

1-4 September

ISPP 2016 International Pelviperineology Conference
Tel Aviv, Israel
Email: info@pelviperineology.com
Web: www.pelviperineology.com

13-16 September

ICS 2016
Tokyo, Japan
Web: www.ics.org/2016

9-12 November

25th National Conference on Incontinence
Adelaide Convention Centre, Adelaide, SA, Australia
Web: www.continence.org.au

25th National Conference on Incontinence 9-12 November 2016

Adelaide Convention Centre, Adelaide



Registration opens
mid June
Early bird closes
23 September

Keynote speakers -

- Prof Ian Milson, Sweden
- Prof Alexander von Gontard, Germany
- Assoc Prof Elizabeth Mueller, USA
- Prof Katherine Moore, Canada
- Dr Rebekah Das, India

continence.org.au/national-conference



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	M	14 pcs	4 packs	169657	3500ml
maxi plus	L	14 pcs	4 packs	169857	4000ml
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MoliCare Premium Soft is changing its name to:

MoliCare Premium Slip

- Updated 10-droplet system for easier identification of absorption levels
- Updated absorption level naming for a more intuitive selection of products
- Established colour coding for fast product identification
- Same product code as MoliCare Premium Soft

Old



- extra
- maxi
- super
- super plus

New



- extra plus
- super
- super plus
- maxi
- maxi plus new

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MoliCare Premium Slip

- Updated 10-droplet system for easier identification of absorption levels
- Updated absorption level naming for a more intuitive selection of products
- Additional "Maxi Plus" absorption level for maximum needs
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- Same product code as MoliCare Premium Soft



The MoliCare Premium Slip range simplifies your day-to-day work

OLD



- extra
- maxi
- super
- super plus

NEW



- extra plus
- super
- super plus
- maxi
- maxi plus new

BACK SHEET



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