

AUSTRALIAN + NEW ZEALAND  
CONTINENCE JOURNAL

National Conference Edition  
Abstracts - Podium Presentations  
32nd National Conference on Incontinence (NCOI)  
22-25 May 2024  
Brisbane Convention & Exhibition Centre, Brisbane QLD



THE OFFICIAL JOURNAL OF THE CONTINENCE  
FOUNDATION OF AUSTRALIA AND THE NEW ZEALAND  
CONTINENCE ASSOCIATION

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Winter 2024  
Volume 30 Number 2  
ISSN 2208-5750

THE OFFICIAL JOURNAL OF THE  
CONTINENCE FOUNDATION OF  
AUSTRALIA + THE NEW ZEALAND  
CONTINENCE ASSOCIATION

Published four times a year by



10 Walters Drive  
Osborne Park, WA 6017  
[www.cambridgemedia.com.au](http://www.cambridgemedia.com.au)

Publisher Greg Paull  
Copy editor Kayt Davies  
Design and layout Gordon McDade

Advertising enquiries to  
Simon Henriques  
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## Call for Papers

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.

To discuss topics or for assistance in the preparation of papers and articles, please email [journal@continence.org.au](mailto:journal@continence.org.au)

## EDITORIAL

**For referencing** Moro C. Editorial. Australian and New Zealand Continence Journal. 2024;30(2):19.

**DOI** <https://doi.org/10.33235/anzcj.30.2.19>

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In this edition of the Australian and New Zealand Continence Journal we are delighted to present the abstracts from the 32<sup>nd</sup> National Conference on Incontinence. This event presents a fantastic way to showcase the broad work that continence and urological researchers are conducting across Australia and New Zealand, and it enables connections between researchers, health professionals and the community.

If you would like to know more about the journal, or to get involved in some way, members of our editorial team and myself will be attending the conference in Brisbane, Queensland, and would be happy to find a time to meet with you at the CFA booth. You can get in-touch with us at [journal@continence.org.au](mailto:journal@continence.org.au).

While this edition is focussed on the abstracts, we continue to invite submissions for our upcoming publications. We encourage multidisciplinary submissions of quality research, and work hard to ensure visibility of published works in the journal. To facilitate this, all publications are available online, as diamond open access, which means there are no cost to authors or readers. Each article is allocated an

individual Digital Object Identifier (DOI) number, to assist with referencing and tracking, and is now listed across a number of databases.

It's these types of features and initiatives that help our journal stand out and present it as an excellent outlet for the submission and the publication of quality works. If you are a first-time author, our reviewing and editorial teams also offer feedback and support to assist on the track to a successful peer-reviewed publication. Performing research not only helps our community with increased knowledge and insights, but also advances the mission of the Continence Foundation of Australia and Continence New Zealand to promote bladder and bowel health, and eliminate the stigma and restrictions of all aspects of incontinence.



**Christian Moro**

Editor-In-Chief and Chair  
Australian and New Zealand Continence  
Journal

# Abstracts – Podium Presentations

## 32nd National Conference on Incontinence (NCOI) 22-25 May 2024 Brisbane Convention & Exhibition Centre, Brisbane QLD

### Characteristics of Participants 3-Months After Pelvic Fracture: Midpoint of an Intervention Trial

Ms Carly McConnell<sup>1</sup>, Ms Alisha da Silva<sup>1</sup>, Mr David Priddle<sup>1</sup>, **A/Prof Wendy Bower**<sup>1,2</sup>

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DOI <https://doi.org/10.33235/anzcj.30.2.20>

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**Introduction:** Fracture to any part of the pelvis can impact pelvic floor function. Our prior small pilot observational study revealed that women can have significant enduring symptoms of bladder, bowel and sexual impairment at least one-year post injury and that men also suffer changes in urogenital function.<sup>1</sup> This abstract presents interim findings of the observational component to a large implementation study screening for pelvic floor dysfunction (PFD) in pelvic trauma patients at 6 and 12 months with nested randomisation to physiotherapy care when PFD is identified.

**Objectives:** To determine the prevalence and severity of pelvic floor dysfunction 3-months post pelvic fracture.

**Methods:** Acute adult inpatients post pelvic fracture were recruited from two tertiary trauma hospitals. Standardised metrics of urogenital function were completed at baseline (recall based on 4 weeks prior to injury) and repeated again 3-months post injury. The instruments used were the Australian Pelvic Floor Questionnaire (APFQ)<sup>2</sup> and simplified International Index of Erectile Function (IIEF-5, males only).<sup>3</sup> Measures were completed electronically using a secure web application (REDCap). De-identified data was imported to SPSS software Version 28 for descriptive analysis. PFD was defined as an increase from baseline in any APFQ domain score of 1 or an IIEF-5 total score of 21 or less.

**Table 1. The top 5 items in the APQF and IIEF-5 with the largest change signifying worsening in pelvic floor function from baseline to 3-month assessments stratified by sex.**

Male		Female	
Question	Domain	Question	Domain
1. When you attempted sexual intercourse, how often was it satisfactory for you?	Sexual function	1. Do you use laxatives to empty your bowels?	Bowel
2. Do you use laxatives to empty your bowels?	Bowel	2. How much does your bladder problem bother you?	Bladder
3. How much does your bladder problem bother you?	Bladder	3. Do you have a feeling of incomplete bladder emptying?	Bladder
4. How many times do you get up at night to pass urine?	Bladder	4. Do you leak with coughing, sneezing, laughing or exercising?	Bladder
5. Do you need to rush/hurry to pass urine when you get the urge?	Bladder	5. Do you wet the bed before you wake up at night?	Bladder

**Results:** A total of 546 patients have been screened up to November 2023; isolated acetabular injury excluded 23.5% of potential participants. Two hundred and thirty-seven participants have been recruited, with significantly more males (n=150) than females (n=87). A total of 65% of participants were identified as having PFD at 3 months; 62% in males and 71% in females. Table 1 describes the top five questionnaire items on which score were worse at 3-month follow up compared to pre-injury. A requirement for aperients and bladder-related bother was prioritised by both sexes.

**Conclusion:** Three months after traumatic insult to the pelvic girdle, nearly 2/3 of patients were found to have a PFD. These participants have subsequently been randomised into the nested controlled trial to determine the uptake of referral to specialised continence or urology services. Reassessment at 12 months will identify both the natural history of PFD with usual orthopaedic care, and uptake and patient status after referral for pelvic physiotherapy.

### Project Funding

Value-based Healthcare Innovation Grant Program, Transport Accident Commission.

Ethics Approval Number: 2021.034, RMH66244.

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## Identifying incontinence on an aged care ward: Results of screening phase of an implementation study

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DOI <https://doi.org/10.33235/anzcj.30.2.22>

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**Introduction:** Individuals over 80 years are four times more likely to be incontinent than younger people.<sup>1</sup> Urinary incontinence (UI) during hospital admission is associated with a longer hospital stay,<sup>2</sup> less independence in self-care<sup>3</sup> and requiring supervision to walk. Despite this threat to independence, UI is rarely addressed during inpatient care.

**Objectives:** The aim was to develop a new way to recognise UI in older hospitalised patients. The specific objective was to report findings from the screening phase of the implementation study to identify UI or faecal incontinence (FI) during sub-acute aged care hospital admission.

**Methods:** An incontinence screening process was implemented for admissions to a tertiary metropolitan hospital sub-acute aged care physiotherapy ward service between June and December 2022. Clinical measures and multidisciplinary electronic medical record (EMR) data were also scrutinised to identify presence of incontinence symptoms. Measures of implementation of the screening tool included proportion of patients that screened positive for UI/FI, agreement between different screening methods, and staff acceptability.

**Results:** A pre-study spot audit (n=10) of patient files identified: 80% without fluid intake documentation, 80% no measured voids, 70% without post-void residual ultrasound measures, 40% documentation of containment products being changed and continence intervention documented 20% of the time. Bowel action were recorded without stool type in 90% of patients; FI was documented in all cases.

Physiotherapists screened for incontinence 83% of the time. Of the 106 patients screened, 89 were capable of self-reporting symptoms. The mean age was 84.5 years (SD 7.6). Overall, 50% screened positive for incontinence. Screening was limited by patient confusion, dementia, delirium, aphasia, drowsiness, and/or refusal. Only 75% of physiotherapists found continence screening a good match to their knowledge and skillset, although all believed continence screening to be relevant and important. Physiotherapists did not find the screening questions easy to include in their assessment. The major barriers impacting questionnaire completion were patient factors including impaired cognition, poor health literacy, or difficulty with recall.

Specific symptom prevalence from the screening questions: UI 27%; urinary urgency 39%; urinary frequency 69%; and FI 16%. Multidisciplinary documentation indicating incontinence was identified in medical notes 21%, occupational therapy notes 37%, fluid balance chart 40% and 19% for UI and FI respectively.

EMR documentation agreement with patient response to screening questions occurred in 55% of cases; different sources of incontinence data showed disagreement in 40% of cases. Although poorly completed, the Functional Autonomy Measurement System items most closely aligned with patient report of incontinence (prevalence of 46%).

With respect to the characteristics of older patients with incontinence, there was no difference in age, sex, clinical frailty, or use of a gait aid when compared to continent inpatients. Incontinent inpatients evidenced more delirium, a higher number of medications, lower mobility and more urinary tract infections than continent inpatients.

**Conclusion:** EMR documentation of incontinence should be optimised. Digital alerts can then be used to trigger investigative data collection that informs individualised treatment of underlying causes of incontinence in older patients during a hospital stay.

### Project Funding

Strategic Innovation Grant from the Australian Association of Gerontology Research Trust.

Ethics Approval Number: HREC/81081/MH-2021.

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## Can targeted, non-invasive, EMG-urowflowmetry led assessments help characterisation of non-neurogenic bladder dysfunction in children?

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DOI <https://doi.org/10.33235/anzcj.30.2.24>

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**Background:** Non-neurogenic bladder or lower urinary tract dysfunction (LUTD) is a common clinical entity in children with the majority responding to urotherapy. For those refractory to urotherapy, identifying the optimal investigation is a challenge. Invasive urodynamics (Videocystometry- VCMG) is poorly tolerated by school age children and artefact prone in toddlers.

**Aims:** To evaluate diagnostic efficacy and acceptability of EMG-urowflowmetry led non-invasive testing protocol for children who remain refractory to urotherapy with limited or no concerns about progressive damage to upper tracts.

**Methods:** Database and medical chart review of consecutive cases referred from the bladder clinic, urology clinic and/or medical clinics was undertaken. Patients who underwent non-invasive testing with a background of structural anomalies were excluded. After ruling out faecal impaction, optimised EMG-urowflowmetry was performed. ICCS endorsed diagnoses were given for the dominant abnormality using the EMG-urowflowmetry information, bladder diary and post void residuals. Data were analysed to estimate change to or supplementary diagnoses, escalation to VCMG, treatment outcomes (wherever available) and compliance/acceptability by patients and families.

**Results:** Ninety-two studies (out of a total of 127) were eligible from 2019 to 2023 [54.3% (n=50) males; median age 9 (4-16) years]. Out of the 92 studies, 62% (n=57) had abnormalities of lower urinary tract function 52.6% (n=30) dysfunctional voiding; 26.3% (n=15) possible underactive bladder; 15.8% (n=9) primary bladder neck dysfunction; 5.3% (n=3) possible overactive bladder. Background diagnoses included vesicoureteric reflux (35.1%), severe constipation/bladder-bowel dysfunction (21%). Pre and post-test diagnoses were similar in 33.3% (n=19) whereas EMG-urowflowmetry changed the LUTD diagnosis in 66.7% (n=38). Out of the total 127, further invasive UDS was required in 1.6% (n=2) patients. Follow-up non-invasive testing to assess treatment response was performed in 7.1% (n=9). No family or child refused or reported extreme distress. Two patients (3.5%) could not void.

**Discussion:** Although no information could be obtained regarding storage or voiding pressures, EMG-urowflowmetry led assessments were well accepted by patients and allowed a robust characterisation of voiding patterns and enabled redirection of care in children with non-neurogenic bladder dysfunction refractory to urotherapy.

# Modified Delphi Approach for Consensus on Constipation Prevention Strategies and Implementation in Residential Aged Care

**Dr Linda Schnitker**<sup>1,2</sup>, Dr Deepa Sriram<sup>1</sup>, Dr Claudia Meyer<sup>1</sup>, Ms Kate McLeod<sup>1</sup>, Ms Fleur O'Keefe<sup>1</sup>, Ms Kath Paine<sup>1</sup>, Professor Jane Phillips<sup>2</sup>, Professor Judy Lowthian<sup>1</sup>

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**DOI** <https://doi.org/10.33235/anzcj.30.2.25>

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**Background and Objective:** People with dementia may not be able to understand the urge to pass stools and go to the toilet, or autonomously apply common constipation prevention measures, leading to constipation and discomfort. The aim of the overall project is to co-design the translation of an evidence-informed multi-component nursing and care staff intervention – the CoCo care-bundle – specifically designed to prevent constipation in individuals living with dementia in Residential Aged Care (RAC). This study component aims to reach consensus on a draft bundle of intervention items, identified from literature and context mapping of practices in two RAC homes, and determine the implementation strategies.

**Methods:** Twenty-four CoCo care-bundle items were identified from existing literature and mapping usual practices for care of residents at risk of constipation. A modified Delphi process and co-design workshop were then conducted to reach consensus and refine these items. First, the items were taken for review to three community partnership groups each comprising of 7-8 older people, including persons who 1) live in RAC, or 2) have lived experience in caring for a partner with dementia, and/or 3) live with bowel health issues, including constipation. Perspectives were shared on the draft CoCo care-bundle items regarding their relevance and acceptability for a person living with dementia. Next, a multi-disciplinary expert advisory panel rated the draft items for relevance, acceptability, and feasibility. Items with item content validity index (I-CVI) of 0.78<sup>1</sup> were included for the workshop discussion, focusing on operationalisation, side effects/risk, fairness, and cost of individual items. The co-design workshop discussion also identified potential implementation strategies, in line with the Implementation Framework for Aged Care<sup>2</sup> and the Expert Recommendations for Implementing Change.<sup>3</sup>

**Results:** The survey rating of initial draft CoCo care-bundle items (n=24) resulted in 13 items with a I-CVI $\geq$ 0.78. One item was excluded following comprehensive workshop discussion. Agreement for inclusion of final items was reached after weighing up the risk and feasibility of implementation for each. Final items included dietician consultation, ensuring adequate daily fibre and fluid intake, environmental changes, establishing a bowel routine, and education. Agreed implementation strategies included regular meetings with project and RAC staff, identifying and training a champion at each RAC home, creating awareness, and disseminating project findings.

**Conclusions:** Preventing constipation is key for achieving quality of life for people living with dementia. Consensus of the CoCo intervention was reached through the modified Delphi process and co-design workshop, including implementation strategies for use in RAC for the prevention of constipation in people living with dementia. Ongoing consultation with relevant stakeholders will continue in the lead up to the planned evaluation study in 2024.

## Project funding

Aged Care Research & Industry Innovation Australia (ARIIA).

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# Genitourinary Foreign Bodies – A single-centre case series and outcomes

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**DOI** <https://doi.org/10.33235/anzcj.30.2.26>

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**Objective:** The presentation of a foreign body in the lower urinary tract is a challenging urological emergency<sup>1</sup> with no clear consensus on the optimal approach, and minimal reported outcomes data. Foreign bodies may cause significant morbidity due to the potential for infection and inflammation, progressing to sepsis or even precipitating Fournier's gangrene.<sup>2</sup> Long term sequelae of foreign bodies can include urethral stricture and chronic infections. Several studies have also established a correlation between mental health disorders and foreign bodies in the genitourinary tract.<sup>3</sup> We aimed to report the contemporary trends and retrieval procedures of genitourinary foreign bodies at our institution over the last twenty years.

**Methods:** A retrospective cohort study was undertaken identifying patients who presented with self-inserted genitourinary foreign body to our three adult tertiary centers from 2000 to 2022. Patient demographics, type of foreign body, psychiatric comorbidities, retrieval techniques, complications and readmission data were extracted.

**Results:** Twenty seven cases of genitourinary foreign body insertion were identified with mean age 46 years old. 23 (85%) were male and four (15%) were female. 10 patients (39%) had a concurrent psychiatric illness and seven (27%) reported illicit substance use. The most commonly inserted foreign bodies were plastic tubes (n=8, 31%). Most of the foreign bodies were retrieved endoscopically (n=19). Three patients (12%) required open cystotomy and one underwent a transperineal urethrotomy. The median length of stay was one day. Four patients (15%) re-presented after discharge. Causes of representation included abscess, fistula development, and urinary retention from urethral stricture. Two patients had repeat presentations for genitourinary foreign body insertion. A significant monotonic positive trend of foreign body presentations was identified (Mann Kendall tau =0.95, p = 0.043).

**Conclusion:** There is a trend of increasing presentations with foreign body insertions over the past two decades. Most cases can be managed endoscopically, however some may require open surgery.

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# The Functional Role of Phosphodiesterase Enzymes in the Isolated Porcine Urethra

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DOI <https://doi.org/10.33235/anzcj.30.2.27>

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**Objective:** Disruptions in pathways that regulate the normal micturition cycle can result in lower urinary tract disorders, including stress urinary incontinence (SUI).<sup>1,2</sup> Phosphodiesterase (PDE) enzymes act by degrading intracellular second messenger molecules, cAMP and cGMP.<sup>3</sup> PDE inhibitors, such as sildenafil (Viagra) and tadalafil (Cialis), normally used for the treatment of erectile dysfunction, have been suggested to relax the urethral smooth muscle from human and animal tissue preparations.<sup>1,2,3</sup> However, these studies have been limited to only investigating the smooth muscle layer. The present study aimed to investigate the functional role of PDE-4 and PDE-5 enzymes in both the urethral smooth muscle and the inner lining of the urethra (mucosal layer) to potentially identify novel treatment targets for SUI management.

**Methods:** Isolated strips of porcine urethral tissue (7mm x 4mm) were prepared into three groups: mucosa-intact smooth muscle, mucosa-denuded smooth muscle, and mucosal layer only. Tissue strips were mounted in 8mL organ baths containing physiological Krebs-bicarbonate solution, maintained at 37°C, and continuously gassed with 95% O<sub>2</sub> and 5% CO<sub>2</sub>. A tension of 1.5-2g was applied, and the tissue strips were allowed to equilibrate for 45 minutes with fresh solution washout every 15 minutes. After a stable pattern of spontaneous contractions was obtained in the urethral mucosa strips, PDE-4 inhibitor, rolipram, or PDE-5 inhibitor, tadalafil, was added cumulatively (0.1 nM – 1 µM). The urethral smooth muscle strips were pre-contracted with phenylephrine (10 µM) before the addition of rolipram or tadalafil. In a separate set of experiments, urethral smooth muscle strips were incubated with the nitric oxide (NO) donor sodium nitroprusside (SNP, 10 µM) for 30 minutes, followed by cumulative addition of tadalafil. One-way ANOVA followed by Dunnett's multiple comparisons test was performed to identify statistically significant differences. A p-value of <0.05 was considered statistically significant.

**Results:** Rolipram relaxed mucosa-intact strips, significantly greater than the mucosa-denuded strips (p<0.05). In contrast, tadalafil relaxed mucosa-denuded strips significantly greater than the mucosa-intact strips (p<0.05). In the presence of the nitric oxide (NO) donor sodium nitroprusside (SNP), the relaxant effect of tadalafil in the mucosa-intact strips was enhanced (p<0.05). In the presence of SNP, tadalafil was more potent than roflumilast in relaxing mucosa-intact (54% vs 39%) and mucosa-denuded (47% vs 13%) strips. In the urethral mucosal-only strips, rolipram (0.1 nM and above) significantly reduced the frequency of spontaneous contractions (p<0.05), but tadalafil did not.

**Conclusion:** The results from this study contribute to the limited body of knowledge on the role of PDE enzymes in the function of the urethral smooth muscle and mucosal layers. The findings suggest a potential novel crosstalk between cAMP in the urethral mucosa and cGMP in the smooth muscle, similarly seen in the heart. The cAMP pathway predominantly modulates mucosal function, which may cause inhibition of NO production, affecting the cGMP pathway, which is essential for the modulation of smooth muscle contractility. To identify novel treatment targets for individuals with stress urinary incontinence, further understanding of the possible crosstalk and function of the mucosal layer should be further investigated.

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## The end-of-life of used pads in Australia – who is filling up the bin?

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DOI <https://doi.org/10.33235/anzcj.30.2.28>

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**Objective** Single-use absorbent hygiene products (AHPs) provide essential health value, but also generate very large quantities of waste, contribute to water resource depletion, emit carbon and use land area for resource production. Currently, most absorbent hygiene products used in Australia end up in landfill.<sup>1</sup> From a technical engineering perspective, there are other potentially more sustainable options for their disposal, but determining the “best” waste disposal pathway for the Australian context is multi-faceted. In order to evaluate a better disposal pathway, we need to map where and how much of this waste is being produced (and will be generated into the future). Therefore, the objective of this work was to better understand the key source(s) of single-use incontinence products for the purposes of informing waste management planning and policy in Australia.

**Methods** AHP waste generated from adult use (~600 kt/y) already outnumbers that generated by infants (~150 kt/y), and the quantity of adult AHP use will increase as our population ages (and birth rates are estimated to stay consistent).<sup>1</sup> Considering a substantial amount of AHP waste is generated by populations over 65, demographics can help inform where to target efforts. 67% of Australian’s live in capital cities, and the fraction for the percentage of Australians over 65 living in capital cities is the same.<sup>2</sup> 40% of all Australians, including 40% of the over 65 population, live in Sydney and Melbourne (Figure 1). From a technical waste management perspective, strategy planning for a densely populated city differs to a regional area, with different relevant cost-benefit factors.

Furthermore, older Australians might be located at home, in aged care or in hospitals, and these different contexts will affect waste disposal. In 2022, 188 000 Australians were using permanent or respite residential aged care.<sup>3</sup> In 2021-2022 public and private hospitals recorded 31.8 million days of patient care<sup>3</sup> which equates to 87 123 patients in hospital each day, of whom only a portion will be over 65. The number of people in aged care and hospitalised represents ~1% (or less) of the total population of Australians over 65. Thus, while older Australian’s living in aged care or admitted to hospital have higher rates of incontinence, the volume of waste produced by use AHPs products is dominated by older Australians living in the community.

**Findings** The majority of AHP waste is generated by older Australians residing in the community in capital cities (primarily Sydney and Melbourne).

**Conclusions** Strategies to reduce the environmental impact of used AHPs will have the biggest impact if targeted towards community waste management in Sydney and Melbourne. This approach has additional benefits of including used AHPs from infants and people who menstruate as well.

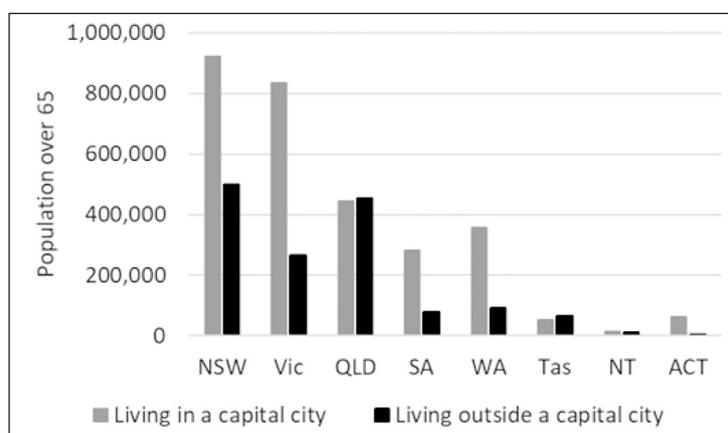


Figure 1. Populations of Australian’s aged 65 and over living inside and outside capital cities (data adapted from ABS 2023).

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# The Australasian Pelvic Floor Procedure Registry: monitoring pelvic floor procedure outcomes

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DOI <https://doi.org/10.33235/anzcj.30.2.30>

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**Introduction:** The Australasian Pelvic Floor Procedure Registry (APFPR) is a national clinical quality registry funded by the Australian Department of Health and Aged Care that aims to monitor the safety and quality of care related to Stress Urinary Incontinence (SUI) and Pelvic Organ Prolapse (POP) procedures that involve pelvic prostheses. Established in 2019 following the Senate Inquiry into transvaginal mesh complications, the APFPR systematically collects, analyses and reports clinical outcomes related to pelvic floor procedures (PFP) with the potential for secondary use of data for research.

Annual data from the Australian Classification of Health Interventions and Medicare Benefits Schedule has confirmed a significant reduction in pelvic floor procedures nationally; the consequences of which can be monitored prospectively via the APFPR.

**Objective:** To provide an update on the scope, methods and progress of the APFPR and present initial findings.

**Methods:** The APFPR is governed by a Steering Committee comprising surgeons, consumers and government departments. An opt-out consent approach is used to recruit patients. Currently, thirty health services contribute data to the APFPR across Australia.

The original APFPR dataset collected pre-operative, operative, and post-operative clinical data for women undergoing SUI and POP procedures involving a prosthesis. In 2023 following a national survey, it was agreed to streamline the minimum data set but include the collection of native tissue SUI procedures to commence in 2024. Patient-reported outcome measures (PROMs) were also piloted for the registry in 2022-23, and the Australian Pelvic Floor Questionnaire, the Patient's Global Impression of Improvement and the EQ-5D-5L surveys are currently being collected at 6, 12 and 24 months following surgery.

Clinical Quality Indicators (CQIs) based on clinical guidelines and credentialing recommendations have been developed to highlight performance in relation to important processes and outcomes. Benchmarked reports to health services were developed in 2023, providing the first comparative information regarding patient and procedure characteristics and outcomes. Procedures reported are stratified by primary (initial surgery) and subsequent procedures (eg revisions or complication management/mesh explantation).

**Results:** As of 28 November 2023, there were 813 patients recruited into the APFPR, with an opt-out rate of 2.9%. Forty-seven percent of these patients underwent procedures at public hospitals. Data relating to 500 pelvic floor procedures have accrued in the database with 13% of these procedures having been undertaken in relation to mesh complications.

CQIs are reported for (1) SUI, and (2) POP (+/- SUI) procedures, and are presented below:

The proportion of primary patient procedures (SUI/POP) with:

- Objective clinical assessments completed (89.5/88.4%)
- Intraoperative cystoscopy performed (99.1/98.9%)
- Improved patient outcomes (82.7/95.3%)

The proportion of primary/subsequent patient procedures for SUI and POP with:

- A return to theatre (0.3/0%)
- Readmission within 30 days (3.3/1.7%)
- Catheterisation on discharge (4.6/0%)

The response rate for PROMs at 6 months post-surgery is approximately 70%. Updated clinical and PROM results will be presented at the meeting.

**Conclusions:** The APFPR is collecting high-quality, standardised clinical data relating to pelvic floor procedures undertaken in Australia. Initial data shows its usefulness as a quality assurance tool for monitoring these procedures.

## Pelvic floor dysfunction service following treatment for primary pelvic malignancies

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DOI <https://doi.org/10.33235/anzcj.30.2.31>

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**Objective:** Service review of the clinical presentation and symptom bother of the first 65 patients through a newly developed and Australian first, multidisciplinary team (MDT) clinic to improve cancer survivorship, quality of life and symptoms of bladder, bowel, and sexual function, following treatment for pelvic malignancy. Clinicians involved in the Pelvic dysfunction service (PDS) team include a nurse specialist, colorectal surgeon, pelvic floor physiotherapist, dietitian, psychologist and social worker. The goal of the service is to improve the quality of life and symptom burden of those referred, and a reduction in occasions of care on the specialist tumour streams within the public hospital system. The main focus of cancer care is on the acute or active treatment phase and is aimed at curing or prolonging life. Many survivors are discharged with ongoing issues as a result of these treatments, and these ongoing symptoms are inadequately addressed in the current cancer care setting.

A study completed by Andreyev in 2007<sup>1</sup> reported 50% of patients receiving pelvic radiotherapy treatment had gastrointestinal symptoms impacting their quality of life, higher (60%) in those completing radiotherapy and surgery combined as part of their oncological treatment.

**Methods:** Inclusion criteria into the pelvic dysfunction service MDT clinic is any adult (>18 years old), that is a patient of West Metro Health service precinct in Melbourne, experiencing primary cancer treatment related bowel, bladder, or sexual dysfunction. On medical referral into the clinic, patients complete baseline assessments using the IMPACT Questionnaire with questions on bowel function in men and women, prolapse and urinary symptoms in women, urinary function in men and sexual function. The PROMIS-29 quality of life measure is also completed. Patient demographic and clinical data RE site of primary malignancy, oncological treatment regimen and baseline questionnaires are captured via REDcap. A hard copy can be provided for any patient with access issues to online questionnaires.

A triage assessment is completed by the nurse specialist and/or pelvic health physiotherapist, with explanation of the service, general advice and booking appointments made with the appropriate members of the treating team.

**Findings:** There were >100 referrals into the service since March 2023, 65 have completed the baseline questionnaires, an initial triage assessment and booking appointment with a member of the MDT. 64.9% of patient's referred into the clinic have received pelvic radiotherapy as part of their cancer treatment, 62% of patients referred have had rectal cancer resection surgery. 11% of referrals have had a primary gynaecological malignancy.

31.6% of patients referred report weekly bowel incontinence, 36.8% reporting daily bowel incontinence. 78.9% of patients referred into the PDS clinic report their bowel symptoms are extremely bothersome (52.6%), or very bothersome (26.3%).

36-44% of patients referred into the service are experiencing bladder dysfunction symptoms of either urgency, frequency, or incontinence.

55.2% of those questioned have had no sexual activity in the prior 4 weeks with their sexual partner.

**Conclusion:** With ongoing treatment, and further referrals into the service, follow up questionnaire data will be collected at 3-6 months after initial contact, which will provide data on the effectiveness of the clinic model and treatment modalities used.

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## 9 Percutaneous Tibial Nerve Stimulation for Overactive Bladder Syndrome: a single-arm trial

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DOI <https://doi.org/10.33235/anzcj.30.2.32>

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**Objective:** Overactive bladder (OAB) is estimated to affect 11.8% of women worldwide causing diminished quality of life, feelings of guilt, apathy, reduced self-esteem and depressive symptoms.<sup>1,2</sup> Lifestyle modifications and muscarinic receptor antagonist remain the mainstay of treatment, but are limited by their efficacy and adverse effects. Access to third-line therapies of intravesical botox or sacral neuromodulation is limited by its invasive nature. Percutaneous tibial nerve stimulation (PTNS) has emerged as a non-invasive treatment option for OAB.

The objective of this study is to establish PTNS administered based on the Medicare Benefit Schedule treatment regime as a safe and effective treatment for OAB.<sup>3</sup>

**Methods:** A single-arm trial involving 84 women with a diagnosis of OAB requiring third-line treatment was offered PTNS administered by urogynaecologists. The primary treatment outcome was patient reported visual analogue score (VAS) improvement of at least 50%. Secondary outcome measures were Urinary Distress Inventory Short Form (UDI-6) score and 2-day bladder diary. Patients also provided feedback on adverse effects encountered. Inclusion criteria for participants with OAB consisted of the ability to provide informed consent, willingness to complete UDI-6 questionnaire and bladder diary, as well as other MBS criteria such as failure of conservative management including anti-cholinergic agents, not suitable for botulinum type A therapy, and not suitable for sacral nerve stimulation. Patients were excluded if there were contraindications to PTNS treatment, were unable or unwilling to participate with treatment protocol, or had no diagnosis of OAB.

**Results:** Eighty-four women between the ages of 25 – 101 years (mean: 72.6 years, median: 75 years) participated in the study. Only one participant had no documented urodynamic study as she was 98 years old at the time of entry into the study. Fifty-eight participants (69%) had detrusor overactivity diagnosed on a previous urodynamic study, a further 6 participants (7%) had bladder oversensitivity, and 4 participants had voiding dysfunction. Thirty-nine participants had undergone a hysterectomy. Twenty-one participants had previously received continence surgery, with the most common procedure being insertion of mesh mid-urethral sling (n=14). Some participants had previously received more than one type of continence surgery. Other types of continence surgeries were colposuspension (n=5) and urethral bulking injections (n=4). Drop out rate from initial treatment regime was 6%. The results showed successful initial treatment protocol of 77.2% based on VAS, and a statistically significant improvement in mean UDI-6 score of 20.13 (P<0.01, SD 12.52). Continued success following tapering protocol of 60.8% with a mean maintenance treatment duration of 21.2 months. 26 women who qualified for maintenance treatment regime discontinued treatment for various reasons after a mean maintenance treatment duration of 14.2 months. No adverse effects were reported.

**Conclusions:** This trial agrees with previously published literature on the effectiveness and safety of PTNS as a treatment modality for OAB. Following the treatment regime as described by the Medicare Benefit Schedule showed showed 77% initial treatment success, and 60% long term success in improving symptoms by at least 50%. Further RCTs to evaluate the optimal treatment protocol are warranted to establish a standardised regime.

**Table 1. MBS items listed for PTNS therapy.**

Item code/ Phase	Treatment description
36671/ Initial	Twelve PTNS treatment sessions delivered over a three-month period. Item 36671 is claimable for each of the 12 initial treatment sessions, and is restricted to specialist urologists, gynaecologists or urogynaecologists.
36672/ Tapering	Five PTNS sessions, delivered over a three-month period, and with the interval between sessions adjusted to maintain therapeutic benefit. Item 36672 is claimable for each of the five tapering sessions. There are no restrictions on who can perform this service.
36673/ Maintenance	One PTNS session monthly on an ongoing basis, comprises no more than 12 sessions, delivered over a 12-month period. Item 36673 is claimable for each maintenance session. There are no restrictions on who can perform this service.

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## How do detrusor responses to clinical antimuscarinic medications vary between differently aged porcine bladders?

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DOI <https://doi.org/10.33235/anzcj.30.2.34>

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**Objective:** Antimuscarinics are the first line medications for overactive bladder (OAB) patients,<sup>1</sup> with a mechanism involving the inhibition of detrusor spontaneous contractions during the filling phase.<sup>2</sup> However, 70% of OAB patients discontinue their antimuscarinic treatments due to lower-than-expected treatment benefits or adverse side effects. With an increasing prevalence of OAB with age, there is a benefit to identifying whether the influence of antimuscarinics on bladder tissue alters due to ageing.<sup>3</sup> This study aims to find the variations in the ability of common clinical antimuscarinics to inhibit contractions of the detrusor and compare these responses in juvenile and adult porcine tissues.

**Methods:** Strips of detrusor tissue from juvenile and adult pigs were mounted in carbogen-gassed Krebs-bicarbonate solution at 37°C. The tissues were paired with carbachol concentration-response curves performed in the absence or presence of oxybutynin (1µM), solifenacin (1µM), darifenacin (100nM), tolterodine (1µM), trospium (100nM) and fesoterodine (100nM). Concentrations were chosen to ensure complete concentration-response curves in response to carbachol. EC50 values for each curve were analysed and estimated affinities calculated. Ethical approval was not required for this study as tissues were sourced from the local abattoir after slaughter for the routine commercial provision of food.

**Results:** All antimuscarinics induced a consistent rightward shift from the control in both juvenile and adult detrusor tissues. Estimated affinities were calculated for oxybutynin (7.47, n=10), solifenacin (6.73, n=8), darifenacin (7.58, n=11), tolterodine (8.09, n=8), trospium (8.69, n=8) and fesoterodine (8.67, n=8) in juvenile detrusor tissues. Estimated affinities were calculated for oxybutynin (7.44, n=9), solifenacin (6.63, n=8), darifenacin (7.95, n=9), tolterodine (7.93, n=8), trospium (9.30, n=9) and fesoterodine (8.54, n=8) in adult detrusor tissues. Comparisons of estimated affinities for each antimuscarinic between juvenile and adult tissues revealed no differences in each tissue's functional response to the six antimuscarinics (p>0.05).

**Conclusions:** This ongoing study suggests that there are no significant differences between detrusor functional responses to antimuscarinics of differently aged porcine samples. Further suggesting that these medications can assist in the treatment of OAB and differences in compliance may be due to lifestyle or behavioral changes with age, rather than alterations in the tissues ability to respond to the prescribed medication themselves.

### Project Funding

Australian Government Research Training Program Scholarship.

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# In vitro effects of the alpha-blocker prazosin on urothelial cancers and bladder function

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DOI <https://doi.org/10.33235/anzcj.30.2.35>

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**Objective:** Bladder cancer, one of the ten most common cancers diagnosed worldwide, presents as a common, complex, and costly disease. Current treatments, including intravesical chemotherapy and immunotherapy, are associated with frequent recurrences and local side effects that significantly affect quality of life.<sup>1</sup> These side effects, including urinary frequency, urgency, dysuria and hematuria, contribute to or intensify urinary incontinence, posing significant challenges in patient care.<sup>2</sup> Consequently, there is an important need for novel therapeutic approaches that offer effective cancer treatment with reduced side effects. In this context,  $\alpha$ 1-ADR antagonists, known for their cytotoxic effects on prostate cancers, emerge as promising candidates. This study aims to investigate the cytotoxicity of the  $\alpha$ 1-ADR antagonist prazosin (Minipress) in bladder cancer cell lines, considering their potential as a bladder cancer treatment with minimal side effects. Additionally, the research explores the impact of luminal prazosin treatment on bladder function using a porcine model, to provide insights relevant to the management of urinary incontinence in bladder cancer patients.

**Methods:** Human malignant urothelial cells lines (invasive T24 cells and non-invasive RT4 cells) were incubated with prazosin (1-300  $\mu$ M) or vehicle control (DMSO) for either a 30-minute or 2-hour period (mimicking the duration of intravesical treatment). Cell viability was then assessed 24, 48, and 72 hours after prazosin incubation using the resazurin reduction assay. To examine the effects of prazosin on bladder function, the luminal surface of female pig bladders were treated with prazosin (300  $\mu$ M) or vehicle control in modified Ussing chambers for 2 hours, followed by organ bath studies to assess functional responses to agonists carbachol, isoprenaline, adenosine triphosphate (ATP), electrical field stimulation (EFS) and high potassium Krebs.

**Results:** Incubation of T24 and RT4 cells with prazosin (300 $\mu$ M) resulted in a statistically significant concentration-dependent decrease in cell viability at 72 hours (Figure 1A). In bladder functional experiments, pre-treatment with 300  $\mu$ M prazosin did not significantly affect nerve evoked contractile bladder responses (Figure 1B). Acetylcholine (ACh) remained the dominant neurotransmitter in control and treated tissues. Responses to purinergic stimulation,  $\beta$ -adrenoceptor relaxation to isoprenaline and general bladder contractility to high potassium were similarly unchanged. However, the maximal response of intact bladder tissues to carbachol was significantly enhanced after prazosin pre-treatment ( $P < 0.001$ ) (Figure 1C), while responses of denuded detrusor and urothelium/lamina propria to muscarinic stimulation were unchanged.

**Conclusions:** The study highlights prazosin's concentration-dependent cytotoxicity against both invasive T24 and non-invasive RT4 bladder cancer cells, highlighting this drug as a promising candidate for targeted bladder cancer therapy. Significantly, prazosin demonstrates minimal impact on normal bladder function in the porcine model, suggesting a lower risk of exacerbating urinary incontinence; a major concern with current intravesical treatments. Future research should investigate prazosin's long-term effects and potential integration into existing treatment regimes, offering a holistic approach to bladder cancer treatment that prioritises both tumor suppression and quality of life.

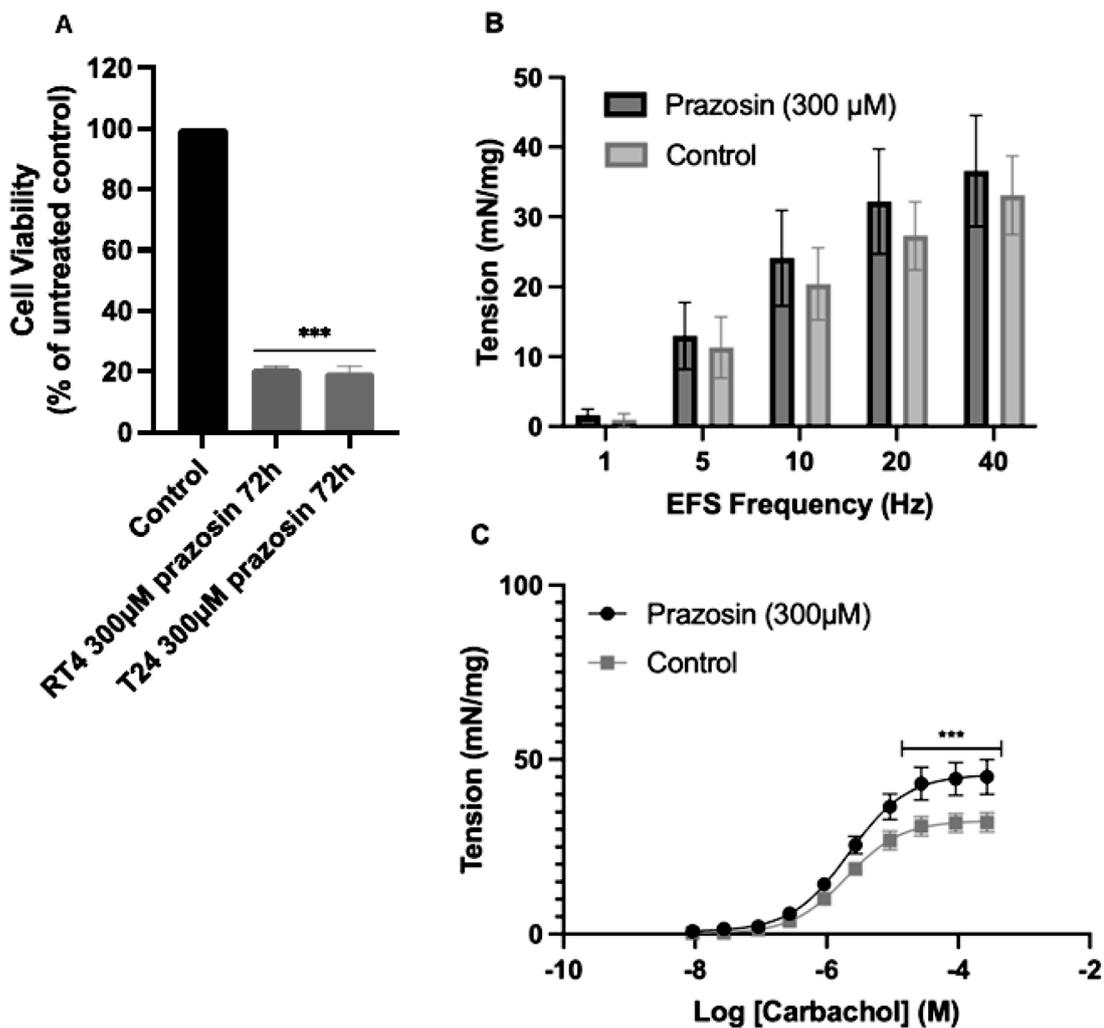


Figure 1. (A) Effects of a 2-hour incubation with prazosin on the viability of T24 and RT4 bladder cancer cells 72 hours after treatment (\*\*P<0.001 compared to control). Responses of (B) porcine detrusor to electrical field stimulation (EFS) and (C) responses of intact porcine tissues to carbachol, after pretreatment with prazosin or control (\*\*P<0.001). Data are displayed as mean ± SEM (n=6).

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## Effect of diabetes on mechanisms controlling bladder function

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DOI <https://doi.org/10.33235/anzcj.30.2.37>

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**Objective:** A majority of patients with diabetes are afflicted with some form of lower urinary tract symptoms (up to 95% in some populations<sup>1</sup>), a phenomenon commonly referred to as diabetic bladder dysfunction (DBD). The symptoms experienced by individuals vary widely from overactive bladder symptoms such as increased urge and frequency, or underactive bladder symptoms such as hesitancy and increased residual volume or mixed symptoms. This complicates research and the mechanisms by which diabetes induces bladder dysfunction are still not well understood. Additionally, poor glycaemic control is believed to exacerbate symptoms, although the details have been difficult to elucidate from clinical studies. Thus, we aimed to use in vitro and in vivo studies to investigate the mechanisms involved in diabetic bladder dysfunction in diabetic mice.

**Methods:** Diabetes was induced in adult female mice by treating with streptozotocin (50mg/kg i.p. daily for 5 days), which affects the pancreas and produces a type 1 diabetes model. Bladder function was examined by measuring voiding patterns and behaviour during the 16-day treatment period, isolated whole bladder preparations and cystometry in urethane-anaesthetised mice (0.9g/kg s.c. and 0.3g/kg i.p.). For whole bladder preparations (in vitro) bladders were isolated from mice and catheterised via the urethra with a 3-way catheter connected to a pressure transducer, outflow tap and infusion pump, to allow filling with saline. Neurogenic bladder contractile responses to nerve stimulation and responses to agents acting on the key neurotransmitter pathways involved in bladder function were examined. In cystometry (in vivo) experiments bladder function was examined under a continuous saline infusion.

**Results:** Diabetic mice had increased ( $P<0.05$ ) blood glucose ( $19.1\pm 1.2\text{mmol/L}$ ,  $n=15$ ) compared to controls ( $9.3\pm 0.4\text{mmol/L}$ ,  $n=14$ ) and urine output was increased four-fold ( $P<0.02$ ). In isolated whole bladders, neurogenic responses to nerve stimulation were significantly reduced in diabetic mice (Figure 1). At 20Hz stimulation bladder responses from diabetic mice were significantly lower ( $10.3\pm 3.6\text{mmHg}$ ,  $n=4$ ) ( $P<0.03$ ) than controls ( $23.2\pm 1.4\text{mmHg}$ ,  $n=6$ ). Similarly, pressure responses to the primary neurotransmitter adenosine triphosphate (ATP), were reduced ( $P<0.04$ ) in bladders from diabetic mice ( $16.9\pm 3.6\text{mmHg}$ ) compared to controls ( $23.9\pm 0.9\text{mmHg}$ ). In vivo, cystometry showed that the peak pressure during voiding was reduced ( $P=0.03$ ) in diabetic animals ( $28.2\pm 0.9\text{mmHg}$ ,  $n=11$ ) compared with controls ( $32.4\pm 1.6\text{mmHg}$ ,  $n=8$ ).

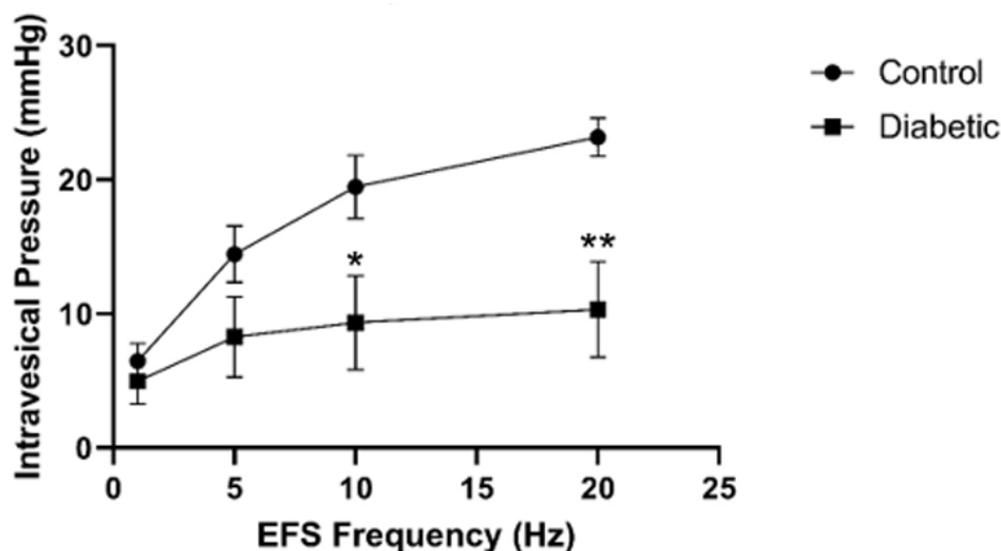


Figure 1. Pressure responses of isolated bladders to nerve stimulation via electric field stimulation at a variety of frequencies. Data is mean  $\pm$  SEM. (Control  $n = 6$ , Diabetic  $n = 4$ , \*  $P<0.05$  vs control, \*\*  $P<0.01$  vs control)

**Conclusion:** The results suggest that diabetes results in reduced pressure development in the bladder during voiding, which is caused by depressed neurogenic contractions resulting from reduced release of the neurotransmitter ATP.

### **Project Funding**

This research was supported by an Australian Government Research Training Program Scholarship.

Ethics Approval Number: 2017/AE000536: Stress and bladder dysfunction, and 2022/AE000224: Mechanisms of Bladder Dysfunction.

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# Effects of acute hypoxia on contractile responses of the bladder mucosa in vitro

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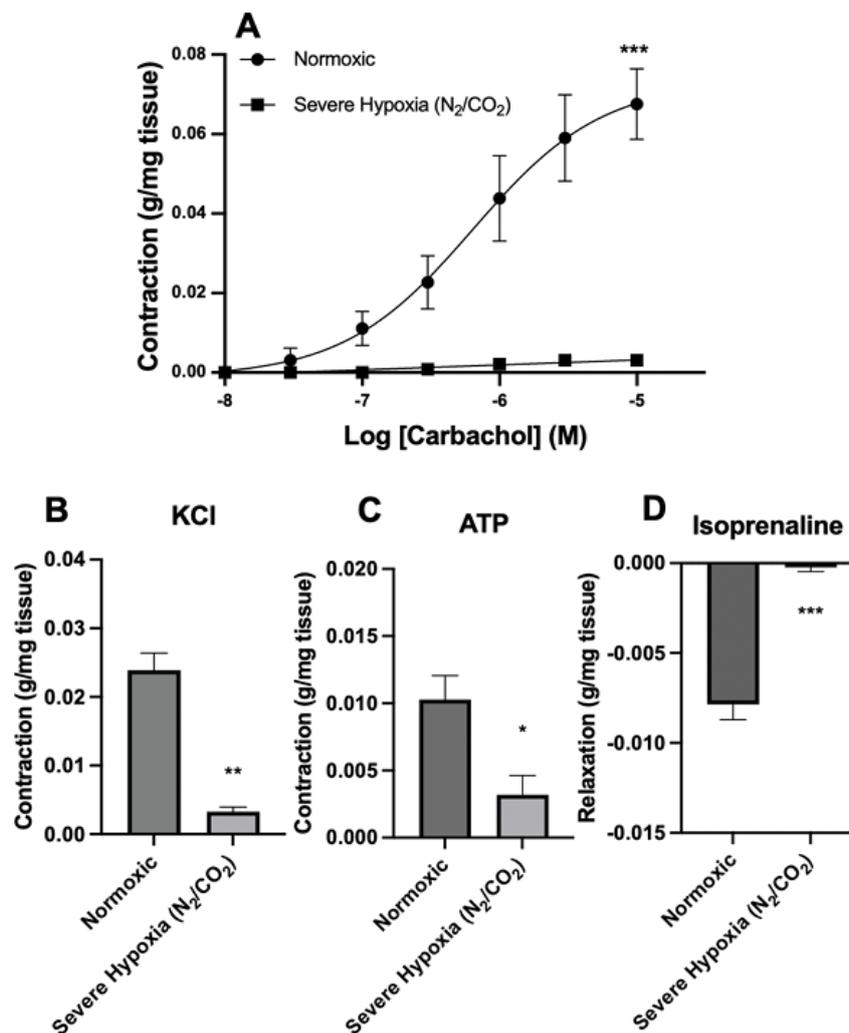
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DOI <https://doi.org/10.33235/anzcj.30.2.39>

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**Objective:** 1 in 5 adults will develop some form of bladder dysfunction throughout their lifetime, with increasing numbers in the elderly<sup>1</sup>. Bladder dysfunction can be characterised by an increase in urinary urgency, frequency, or having to get up from bed to urinate (nocturia).<sup>1</sup> Bladder dysfunction has been linked to reduced blood flow to the bladder, leading to reduced oxygen (hypoxia).<sup>2</sup> The bladder mucosa, which contains the inner urothelium lining and underlying lamina propria, is an important regulator of bladder function, but the consequences of hypoxia on mucosal function remains uncertain.<sup>3</sup> This study aimed to investigate the effects of acute hypoxia on contractile responses of the bladder mucosa in vitro.

**Methods:** Isolated bladder mucosa tissue strips from female porcine bladders were mounted in 8mL organ baths containing physiological Krebs-bicarbonate solution and gassed with 95% O<sub>2</sub>/5% CO<sub>2</sub> (normoxia) for 15 minutes (maintained at -1.5 g tension, 37° C). Tissues were then switched to either severe hypoxia (95% N<sub>2</sub>/5% CO<sub>2</sub>, 18 oxygen %) or mild hypoxia (95% Air/5% CO<sub>2</sub>, 100 oxygen %), with separate normoxic controls included in each experiment. Cumulative concentration responses (10nM-100µM) to the muscarinic receptor agonist, carbachol, were measured, along with responses to the β-adrenoreceptor agonist, isoprenaline (1 µM), to assess relaxation, and contractions to ATP (10 mM) and high KCl Krebs (60 mM).



**Results:** Severe hypoxia significantly decreased maximum contractile responses of the mucosa strips to carbachol to  $5.0 \pm 1.5\%$  of the normoxic (control) response ( $P < 0.001$ ,  $n=6$ ), with the responses to ATP ( $P < 0.05$ ,  $n=5$ ) and KCl ( $P < 0.01$ ,  $n=5$ ) reduced to  $32 \pm 16\%$  and  $14 \pm 3.8\%$  of control respectively. However, the potency of carbachol was not affected by severe hypoxia ( $-\text{LogEC}_{50}$ : control  $6.19 \pm 0.25$  vs severe hypoxia  $6.21 \pm 0.35$ ). The relaxation responses to isoprenaline were also attenuated ( $P < 0.001$ ,  $n=6$ ). Mild hypoxia also significantly decreased maximum contractile responses of the mucosa to carbachol ( $P < 0.001$ ,  $n=6$ ). Responses to ATP and KCl followed a similar trend, although there was no statistical significance. Relaxation responses to isoprenaline were also decreased under mild hypoxia, though not significantly.

**Conclusion:** The results demonstrate a depressant effect of acute hypoxia on relaxation as well as contractile responses of the bladder mucosa. This change is likely due to a general decrease in mucosal contractility rather than receptor specific changes. These changes may contribute to the bladder dysfunction associated with reduced blood flow and hypoxia.

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## NEWS

### AUSTRALIAN NEWS

#### CEO update

The Board and staff of the Continence Foundation of Australia would like to welcome our new CEO, Dr Gian Sberna.

With over 20 years of management experience across healthcare, the not-for-profit sector, medical research, higher education and ASX-listed companies, Dr Sberna's rich business acumen has seen him in high-level executive positions including Head, Office of Cancer Research at The Peter MacCallum Cancer Centre and Head of Operations at the Murdoch Children's Research Institute.

Prior to commencing his role at the Continence Foundation of Australia, Dr Sberna was CEO of the Australian and New Zealand Intensive Care Society, guiding the society through the height of the pandemic, establishing a trusted partner role with all levels of government and presenting pandemic preparedness data and advice to the Chief Medical Officer of Australia.

Dr Sberna is also a member of the Australian Institute of Company Directors and has extensive experience as a non-executive director and board chair. The Foundation is excited to commence a new chapter with Dr Sberna.

#### National Consumer Survey

The Continence Foundation of Australia recently released the 2023 National Consumer Survey Analysis, highlighting the community's perceptions and experience of incontinence, the quality of life and wellbeing of people who experience incontinence and their carers. Approximately 2,000 people participated in the survey, broadly representing the Australian population in terms of age, gender and geography.

Some key insights from the survey include:

- **Prevalence of Incontinence:** 39% of respondents reported currently having or having had incontinence in the past. Among them, 24.2% were females and 14.8% were males.
- **Awareness and Acceptance:** Over 60% of respondents say they have become more aware of incontinence and are more accepting of people who have it.
- **Ease of Experience:** Among respondents, 40% reported that over the past 12 months, their experience of incontinence has become easier, while 15% said it has become harder.
- **Positive Communication:** 64% of respondents said that talking with their friends and family about their experience with incontinence was the most positive aspect.

#### World Continence Week 2024

Running from 17-23 June, World Continence Week is an annual initiative to raise awareness about incontinence and where to seek support. This year, the Continence Foundation of Australia will be promoting the theme 'Let's Talk'.

In line with this theme, the Foundation will be launching a nationwide, multichannel campaign including social media, downloadable media kit, digital advertising and public relations, in order to raise awareness of incontinence amongst the general public.

The Foundation will also be releasing a very special edition of the Bridge Magazine, with a theme of having the will to seek assistance and support for incontinence issues. The interviews conducted so far have revealed strong messages about the importance of feeling at ease to discuss health matters. Only in this way, can people be better equipped to better manage their incontinence.

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#### Gian Sberna

CEO, Continence Foundation of Australia

## NEW ZEALAND NEWS

### World Continence Week

This World Continence Week (17-23 June) we are fortunate to have beloved New Zealand entertainer Jason Gunn once again partnering with us for our campaign.

Jason is taking up our pelvic health challenge and encouraging New Zealanders around the country to do the same. Jason's engaging and inspiring videos have reached many thousands of New Zealanders, and we are grateful that he has chosen to support our campaign for a third year.

We are also grateful to the Royal Australian and New Zealand College of Obstetricians and Gynaecologists (NZ Office), Physiotherapy New Zealand, and the College of Midwives for their support of the campaign, in particular the collaborative approach to our pelvic health webinar which will be held during World Continence Week and for sharing the campaign with their members.

Thank you also to our members for your ongoing support, we truly appreciate the effort that goes into promoting and sharing the campaign to raise awareness, reduce the stigma, and encourage help seeking. You can find the full details of our campaign [here](#).

### CEO recruitment

Given the significant changes occurring within the Ministry of Health in New Zealand, our Executive Committee has decided to delay recruitment for the CEO role until it is known if there will be any impact to our organisation.

In the meantime, it is business as usual for our small team as we continue to focus on delivering World Continence Week, a variety of educational opportunities, and our usual service delivery.

We look forward to updating you about any changes to the recruitment process soon.

### Education

We have a range of online courses and webinars available via our website. Our members can also access additional webinars and this journal through our member portal.

We will have further webinars for both adults and children running throughout the year, including a series to support students with intellectual disabilities, which has kindly been funded by the IHC Foundation.

Visit our website [here](#) for access to our current education offerings.

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### Louise Judd

Acting CEO, Continence NZ