



Nursing Research and Practice Development Centre

The Prince Charles Hospital
Australian Catholic University



Nursing Research
and
Practice Development
Centre

ANNUAL RESEARCH REPORT 2021

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Welcome



Professor Paul Fulbrook

Nursing Director Research and Practice Development

On behalf of The Prince Charles Hospital (TPCH) and Australian Catholic University (ACU) Nursing Research and Practice Development Centre (NRPDC), welcome to our 2021 Annual Research Report.

This report provides information about the NRPDC research activities during 2021. It includes information about our many and varied research projects and research outputs, and acknowledges our affiliated clinicians and research students.

As was the case for many researchers in 2021, our research activity was severely impacted due to COVID-19. Within TPCH, much of our clinical research was put on hold or was delayed for several months. However, we were able to refocus much of our research activity on systematic reviews. Despite the challenges we faced in 2021, our research outputs were very good, and I am proud to present this year's research report.

The NRPDC nursing research priorities are established annually and are embedded within the NRPDC Strategic

Plan 2021-2024, which is agreed jointly between TPCH and ACU. The NRPDC Strategic Plan performance indicators are consistent with key objectives identified in the Metro North Hospital and Health Service Strategic Plan, as well as ACU's Research Indicators.

Pressure injury prevention and management is our main research priority area, and is where most of our research activity is focused. This research priority is aligned with the Australian Council on Healthcare Standards, National Safety and Quality Health Service (NSQHS) Comprehensive Care Standard 5: Comprehensive Care. Our research has continued to be productive within this priority area in 2021.

The Centre continues to demonstrate significant research activity, including publication output in peer-reviewed journals. Our publication output continues to be excellent, with many colleagues contributing to publications in high quality Q1-ranked journals. Although limited by COVID-19 restrictions, we presented several international and national conference papers in 2021.

In late 2021, we welcomed Dr Adam Burston as a part-time research fellow (joint appointment with ACU) to our team. Adam brings a wealth of experience, and will contribute to our pressure injury research program. Adam replaces Dr Sandra Miles, who has now retired. During her years with NRPDC she published many papers and supervised many research students. However, Sandra will be continuing her association with NRPDC via an Honorary Research Fellow position with ACU. Currently, we have one part-time nurse researcher (joint appointment with Queensland University of Technology): Josie Lovegrove. Although she is currently on maternity leave she will shortly submit her PhD. The NRPDC employs two part-time research assistants (joint appointments with ACU). Saroeun Ven has been with NRPDC for around two years and recently completed her BA Honours First Class while in her role. Jacob Butterworth is our most recent addition to the team, replacing Amanda Genn who moved to a new role in quality and safety. We thank her for her valuable contribution. Jacob is currently studying for his BA Honours degree.

All members of the research team undertake research studies in our pressure injury research program. The NRPDC has also facilitated several visiting researchers from ACU, who have been involved with NRPDC and TPCH staff on a variety of projects. This collaboration strengthens the research training environment within both organisations.

The continuing hard work of the NRPDC staff, and the collaborations formed with clinician-researchers, have contributed significantly to our ability to conduct clinically relevant research. Although most of our research has been nurse-led, we have developed productive collaborative research partnerships with several other professional disciplines and organisations.

Forewords



**Clinical Associate Professor
Cherie Franks**

Director of Nursing, Nursing
Services

The Prince Charles Hospital

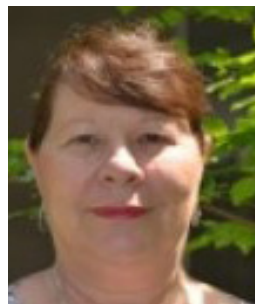
It is always a pleasure to provide a foreword for the Annual Research Report and again this year for 2021.

The Nursing Research and Practice and Development Centre (NRPDC) and the ongoing collaboration between The Prince Charles Hospital (TPCH) and the Australian Catholic University remains strong, and is now into its 11th year.

The NRPDC has continued to offer nurses the opportunity to increase and develop their level of knowledge by participating in its mentoring and scholarship programs, enrolling in master's and doctoral research programs and a range of research activities to advance their clinical practice and improve patient outcomes.

I would personally like to acknowledge the hard work and commitment of the NRPDC team led by Professor Paul Fulbrook, and TPCH nursing staff for the achievements that are highlighted within this annual report.

As Director of Nursing for TPCH, I remain passionate and committed to supporting nursing research and its implementation into practice for the care of our patients and the community.



Professor Karen Nightingale

National Head of School of Nursing,
Midwifery and Paramedicine

Australian Catholic University

It gives me great pleasure to provide a foreword to the Annual Report that reflects on our achievements in 2021. The Nursing Research and Practice Development Centre (NRPDC) continues to support nurse education, nursing research and practice development by our nurse-led research team.

Professor Paul Fulbrook, Clinical Chair (jointly funded by the TPCH and ACU), leads the research team which is comprised of nurse leaders from The Prince Charles Hospital (TPCH) and Australian Catholic University (ACU), School of Nursing, Midwifery and Paramedicine within the Faculty of Health Sciences. The NRPDC is also complemented by a number of honorary TPCH appointments and visiting ACU researchers who contribute to a range of research proposals and projects. In the Excellence in Research for Australia assessment, ACU continues to receive the top score above world standard for research in nursing and ACU is also recognised globally as a leader in a range of subject specialisations; it is ranked 7th in Australia and 18th in the world for nursing.

In 2021, similar and new challenges occurred with COVID-19 significantly disrupting the health workforce and I would like to pay tribute to the many frontline nurses and other healthcare workers who have tirelessly worked throughout this pandemic and still continue to do so. Although clinically based research was heavily impacted by COVID-19 and suspended for large periods of time, the team is to be commended for its continued research efforts and publications in Q1-ranked journals, advancing their agenda 'to make an impact by implementing evidence-based practice that contributes to improved clinical outcomes'.

TPCH and ACU's strong collaboration continues to strengthen in growing the research agenda and advancing our commitment to support vital research to provide quality healthcare. I hope you enjoy reading this report as a testimony of our ongoing shared vision and commitment to quality research outcomes.

Introduction

About

The NRPDC was founded in 2010, to foster change through research and encourage the implementation of evidence-based practice regarding patient care. Its overall aim is to contribute to improved clinical outcomes. The NRPDC houses a nurse-led research team whose aim is to inspire, support, and undertake quality research within the hospital and university. Its current research priority area, which is established within the NRPDC Strategic Plan 2021-2024 is:

pressure injury prevention and management.

Aims

- To undertake research and practice development that is aligned with TPCH nursing strategy.
- To undertake research and practice development that impacts on the quality of patient care and improves outcomes.
- To extend nursing research capacity and capability, and enhance the research culture within the hospital and the university.
- To assist clinicians in research activities by providing mentorship and facilitation for research development, data collection, data analysis, and dissemination.
- To provide research ethics and governance guidance.
- To provide information regarding internal and external funding sources, and assist/collaborate with research grant applications.

- To support and co-write research articles for local, national and international conferences and peer reviewed journal publications.
- To assist clinical staff to obtain adequate funds to provide time away from their substantive roles to work on research projects.
- To support nursing staff to undertake higher degree by research (HDR) studies; supervised via the NRPDC.
- To provide HDR students with supervision, a research community, and office space and facilities to work on their research.
- To contribute to ACU's research outcomes.

Governance

The NRPDC is governed by a Steering Committee, which meets to agree on and monitor the strategic direction and outcomes of the centre. In 2021, its members were:

Adjunct Professor Alanna Geary, Chief Nursing and Midwifery Officer, Metro North Health; **Clinical Associate Professor Cherie Franks**, Director of Nursing, TPCH; **Professor Suzanne Chambers**, Executive Dean, Faculty of Health Sciences, ACU; **Maryanne Humphries**, Acting Nursing Director, Clinical Effectiveness, TPCH; **Professor Karen Nightingale**, Head, National School of Nursing, Midwifery and Paramedicine, ACU; **Associate Professor Paula Schulz**, Head of School (Qld), School of Nursing, Midwifery and Paramedicine, ACU; **Professor Paul Fulbrook**, Nursing Director, Research and Practice Development, NRPDC, TPCH and Professor of Nursing, School of Nursing, Midwifery and Paramedicine, ACU.



The Prince Charles Hospital

Personnel



**Professor Paul Fulbrook RN;
PhD, MSc, PGDipEduc, BSc
(Hons)**

Nursing Director

Paul was appointed as Professor of Nursing at ACU in late 2004. He began collaborating with TPCCH in mid-2008. This led to his establishment in a full-time jointly funded role at TPCCH in mid-2009, as Nursing Director, Research and Practice Development. He has an active role in the research life of TPCCH, and is a founder member of its Research Council, and a member of the hospital's Human Research Ethics Committee. Paul's clinical and research background is in intensive care nursing.



**Josephine Lovegrove RN;
BN (Hons), PhD(c)**

Nurse Researcher

Josie is a part-time joint appointment between TPCCH and QUT. She has worked on a variety of projects in the pressure injury research program. She completed research for her Honours degree, investigating nurses' clinical judgement of pressure injury risk assessment and preventative interventions, graduating with First Class Honours. She is currently undertaking her PhD, investigating pressure injury prevention in intensive care and will submit next year. She is a recipient of a TPCCH Foundation PhD scholarship.



**Dr Sandra Miles RN, RM,
CCYPN; PhD, MN (Child &
Adol), BN**

Research Fellow

Sandra is a part-time member of the NRPDC who also maintains a teaching and research position as Senior Lecturer in the School of Nursing, Midwifery and Paramedicine at ACU. Sandra also co-supervises NRPDC-based research students and assistants. Sandra retired at the end of 2021.



Saroeun Ven RN; BN (Hons)

Research Assistant

Saroeun is a part-time research assistant. She researched nurses' clinical judgement of pressure injury risk for her BN Honours degree, which she completed this year, graduating with First Class Honours. Her clinical background is palliative care nursing. Next year, she intends to enrol for PhD, investigating pressure injury risk assessment in this field.



**Adam Burston RN; BN, PhD,
M Health Serv Manage,
Grad Cert (Nurs)**

Research Fellow

Adam joined the NRPDC in late 2021 as a part-time Research Fellow. He is also a senior lecturer at ACU. Working with the NRPDC, he is engaged in exploring patients' and carers' experiences of living with a pressure injury. He also supervises research students.



Jacob Butterworth RN; BN

Research Assistant

Jacob is part-time and has worked on a variety of projects in the pressure injury research program. He is undertaking an Honours research degree investigating mucosal pressure injury incidence. He also works part-time in the emergency department at Redcliffe Hospital.

Steering Committee

The NRPDC is governed by a Steering Committee, which meets to agree on and monitor the strategic direction and outcomes of the centre. It is comprised of the following members

Adjunct Associate Professor Alanna Geary	Chief Nursing and Midwifery Officer, Metro North Health	Professor Suzanne Chambers	Executive Dean, Faculty of Health Sciences, ACU
Clinical Associate Professor Cherie Franks	Director of Nursing, TPCH	Professor Karen Nightingale	Head, National School of Nursing, Midwifery and Paramedicine, ACU
Maryanne Humphries	Acting Nursing Director, Clinical Effectiveness	Associate Professor Paula Schulz	Head of School (Qld), School of Nursing, Midwifery and Paramedicine, ACU
Professor Paul Fulbrook	Nursing Director, Research and Practice Development, NRPDC & Professor of Nursing, ACU		

TPCH and ACU Partnership Representatives



Clinical Associate Professor Cherie Franks RN; BN, MHA, Grad Cert Health Stud (Nurs), MACN

Director of Nursing, The Prince Charles Hospital

Cherie holds positions as Clinical Associate Professor, ACU and Adjunct Associate Professor, University of Queensland, with post graduate

qualifications at both universities. Since 2015, Cherie has been the Director of Nursing at TPCH, which is a large tertiary hospital of over 600 beds within Metro North Health. She is responsible and accountable for the provision of effective leadership, high level operational management and clinical expertise. Her passion and commitment is for clinical safety, patient outcomes and leading clinical service delivery in the provision of excellence. Cherie has a strong interest in nursing research and works collaboratively with the Nursing Director Research and Practice Development to integrate research evidence into clinical practice, and to further develop partnerships with consumers, researchers and clinical staff to strengthen nursing research and health care outcomes.



Professor Karen Nightingale RPN, RN; BAppSc, MCLinNsg, MED

National Head of School of Nursing, Midwifery and Paramedicine, Faculty of Health Sciences, ACU

Karen commenced at ACU in 2010. She came to ACU with over 20 years' experience in higher education. As head of one of the largest schools

within the university she has oversight of approximately 10,000 undergraduate and postgraduate students across three disciplines and six campuses. Karen is therefore well placed to be abreast of a range of academic and other issues affecting both students and staff. She has experience in teaching international and local students in undergraduate and postgraduate courses and has supervised research students in masters degrees. Karen's specialist expertise is in nursing education, curriculum development, student nurses' clinical placements and student teaching and learning. Her clinical background encompasses both mental health and general nursing in both the acute care and community sector. She has worked in four other large Victorian universities in senior leadership roles, including Director of Teaching and Learning and Director of Undergraduate Nursing Programs. Karen is the chair of or a member of a range of school, faculty and university committees, a member of the Council of Deans of Nursing and Midwifery and is a Fellow of the Australian College of Nursing.



Maryanne Humphries RN;
BN, M Counselling, Post Grad
Communications (Public Relations),
Grad Cert Emerg

A/Nursing Director, Clinical Effectiveness

Maryanne is a senior member of the Nursing Services Team, responsible and accountable for the provision of effective leadership, high level operational management and expertise for the planning, coordination, formulation and direction for the specialist hospital wide services. This includes nursing research, wounds and quality/standards, informatics, and the Quality and Effectiveness Support Team (QuEST). This workforce supports excellence in clinical care and ensures the planning, delivery and evaluation of high quality and cost-effective services that are consistent with the strategic and operational directions of The Prince Charles Hospital, Metro North Health service and policy of the Department of Health. Maryanne has worked across a variety of health care settings including Rural and Remote, Private Sector and Queensland Health for 29 years and has held several senior nursing positions across senior leadership, clinical governance and patient safety.



Associate Professor Paula Schulz,
RN; BA, BSc (Hons), MPsyh
(Community & Health), DPsych
(Health)

Head of School (Qld), School of Nursing,
Midwifery & Paramedicine, ACU

Paula has worked in tertiary education for nearly 30 years and has held several academic leadership positions with the School of Nursing, Midwifery and Paramedicine and Faculty of Health Sciences at ACU. She is currently Head of School, School of Nursing, Midwifery and Paramedicine (Qld), a position she has held since 2011. In this role she has been instrumental in establishing the ACU Clinical Schools with The Prince Charles Hospital and Mater Health. Paula completed her Doctorate in 2007, investigating the efficacy of a modified Theory of Planned Behaviour that included anticipated regret as an additional variable in determining the reproductive intentions of women. Her research interests lie in the areas of transition support strategies for students in their first year of university, program support strategies for Aboriginal and Torres Strait Islander students enrolled in the Away from Base Bachelor of Midwifery program and evaluation of alternate models of nursing education.



Emergency Department TPCH



Clinical Sciences Building TPCH

Visiting Researchers



Dr Peter Le Rossignol, PhD, BSc (Educ), M Phys Educ

Visiting Research Fellow

Peter is an exercise physiologist, and is a researcher and sessional academic in the School of Behavioural and Health Sciences at ACU. He has a particular interest in supporting people to improve well-being through building mental and physical resilience. He has an extensive academic background in exercise science and is currently engaged in a project exploring the effects of sleep, stress, and physical activity on undergraduate nursing students during clinical placements.



Dr Alison Peeler, RN; PhD, MPhil, PGCert (Paed), PGCert (Paed Int Care), GradDip (Neonat)

Visiting Research Fellow

Alison regularly visits the NRPDC, and lectures in the School of Nursing, Midwifery and Paramedicine at ACU (Brisbane) the remainder of the time. She has over thirty years' experience as a registered nurse and has worked in many areas including education, research and management. For her Master of Philosophy degree, Alison researched parents' and nurses' experiences of respiratory support of children with respiratory distress syndrome due to acute bronchiolitis. For her PhD she evaluated the new paediatric emergency department at TPCH.



Dr Roger Lord, PhD, BAppSc, Assoc Dip App Sc, ARCPA

Visiting Research Fellow

Roger is a registered clinical biochemist and Associate of the Royal College of Pathologists of Australasia in chemical pathology. He is a university academic and senior lecturer (Medical Sciences), attached to the School of Behavioural and Health Sciences, Australian Catholic University and a Visiting Research Fellow with the NRPDC. Roger has served on advisory committees to the Therapeutic Goods Administration (TGA) and currently holds an appointment as a specialist advisor to the TGA for pharmaceutical expertise in relation to transplantation and infectious diseases. He is currently clinically credentialed by Queensland Health for full scope of practice in clinical biochemistry and immunopathology at TPCH.



Dr Michael Steele, PhD, BSc(Hons), BSc

Visiting Research Fellow

Michael is a statistical consultant at NRPDC and lectures biostatistics in the School of Allied Health at ACU (Brisbane). He has over 25 years' experience as an applied statistician and has consulted for many health/medicine projects in Australia, New Zealand and Brunei Darussalam. His areas of research are diverse but include a focus on statistical projects from nursing, allied health and Queensland emergency departments. His PhD investigated the power of goodness-of-fit tests.

Associate Researchers



Dr Vainess Mbuzi, RN; PhD, BN, MN (Primary Health Care), MN Adv Prac (Health Prof Educ), Grad Dip (Intens Care Nurs)

Nurse researcher: intensive care

Vainess is a Clinical Nurse working in the Adult Intensive Care Service at TPCH. She has over 30 years of experience as a registered nurse and has worked in a variety of areas, including education and management, overseas and in Australia. She recently completed her PhD under the supervision of Professor Paul Fulbrook and Dr Sandra Miles, and is collaborating with NRPDC on several projects.



Damian Williams, RN; MNP, BNSc, Grad Cert Clin Nurs, Cert IV WPAT N

Nurse researcher: wound care

Damian has been involved in delivering advanced wound management services for over 20 years. His current position is a Nurse Practitioner Wound and Stoma within Community and Oral Health and Clinical Nurse Consultant for Wound Management at TPCH. He is actively involved in gaining knowledge and promoting best practice wound management. Damian is collaborating on several research projects with the NRPDC.

Post Graduate Research Students

2021 Post Graduate Research Students			
Research Student	Degree	Supervisors	Thesis title
^a Alison Peeler (graduated)	Doctor of Philosophy	^a Prof Paul Fulbrook ^a Dr Sandra Miles ^β Dr Frances Kinnear Prof Karen-Leigh Edward	Evaluation of a paediatric emergency department: a three-phase study
^a Saroeun Ven (graduated)	First Class Honours	^a Prof Paul Fulbrook ^a Dr Sandra Miles ^a Josephine Lovegrove	Pressure injury risk assessment using a structured tool compared to clinical judgement: A pilot study
^a Josephine Lovegrove (current)	Doctor of Philosophy	^a Prof Paul Fulbrook ^a Dr Sandra Miles ^a Dr Michael Steele Angel Cobos Vargas	Development of an international risk-stratified pressure injury prevention bundle for intensive care
^β Jacob Butterworth (current)	Honours	^a Prof Paul Fulbrook ^a Dr Sandra Miles ^a Josephine Lovegrove	Incidence and characteristics of hospital acquired mucous membrane pressure injury: a five-year analysis



Graduation (left to right): Dr Alison Peeler, Professor Paul Fulbrook, Dr Sandra Miles

Research Projects

PRESSURE INJURY PREVENTION AND WOUND MANAGEMENT

NSQHS Standard 5: Comprehensive Care

Implementation and evaluation of multi-layered pressure injury prevention strategies in an Australian intensive care unit

Fiona Coyer (QUT), Jane-Louise Cook (QUT), Anna Doubrovsky (QUT), Jill Campbell (QUT), Amanda Vann (RBWH), Greg McNamara (RBWH), Karen-Leigh Edward (Swinburne University of Technology), Gunter Hartel (QMIR), ^aPaul Fulbrook

The objectives of this before and after study, which was led by the Royal Brisbane and Women's Hospital/ QUT, were to implement targeted evidence-based pressure injury prevention strategies and evaluate their effect through measurement of patient pressure injury occurrences. Weekly observations of critically ill patients' skin integrity were conducted by research nurses over a 1 year period. During this time, 15.4% (97/631) of patients developed a pressure injury with the majority of these injuries (71/97) caused by devices. After adjustment for covariates known to influence hospital-acquired pressure injury development, pressure injury rates for the post-intervention period compared to the pre-intervention period had an odds ratio of 0.44 (95% CI 0.20-0.97). It was found that the use of defined pressure injury prevention strategies targeted at both staff and patients, reduced pressure injury prevalence.

DISSEMINATION: Q1 publication in *Australian Critical Care*.

FUNDING: in-kind.

Prevalence and incidence of pressure injury in cardiac intensive care: a systematic review

^aPaul Fulbrook, ^aSandra Miles, ^bVainess Mbuzi

Intensive care patients are at high risk of pressure injury development. The aim of this systematic review is to investigate the prevalence of pressure injuries in adult cardiac patients admitted to intensive care. Fifteen studies met the criteria for inclusion in the systematic review, of which 14 were incidence studies. The 95% confidence interval of cumulative incidence across all 14 studies, with an overall sample size of 6371, was 9.8–25.6%. In 11 studies that included all-stage pressure injury the 95% confidence interval was 8.3–28.3%. In seven studies in which Stage 1 pressure injury was excluded, the 95% confidence interval was 5.8–22.7%. In the single prevalence study included, which excluded Stage 1 pressure injury, prevalence was

8.8%. It was concluded that the incidence of pressure injury in cardiac intensive care patients was similar to that found in general intensive care patients. However, our results suggest that the incidence may be significantly higher in cardiac surgical patients admitted to intensive care.

DISSEMINATION: the systematic review protocol was registered with PROSPERO International. Q1 publication in *International Journal of Nursing Studies*.

FUNDING: in-kind.

Systematic review and meta-analysis of the effectiveness of pressure injury preventative interventions for acute hospitalised patients

^aJosephine Lovegrove, ^aPaul Fulbrook, ^aSandra Miles, ^aMichael Steele

The overall aim of this study was to identify and assess which interventions (single or bundled) are effective in preventing PI in adult inpatients admitted to acute hospital settings. A systematic review protocol was developed and registered with PROSPERO International. Randomised controlled trials which trialled the effectiveness of pressure injury preventative interventions on a primary outcome measure of pressure injury incidence within adult inpatients in acute hospital settings were included in this review. Of 2000 records, 45 studies were included in the systematic review which investigated nine different intervention types. Several meta-analyses were undertaken, pooled by intervention type. Based on intention-to-treat data, only one intervention demonstrated a statistically significant effect. Following meta-analyses using intention-to-treat data, only one intervention was found to demonstrate a statistically significant effect in reducing pressure injury in adults admitted to acute hospital settings: Australian medical sheepskin surfaces compared to other standard care surfaces (risk ratio 0.42, $p = 0.006$, $I^2 = 36\%$). Following per protocol meta-analyses, only two intervention types demonstrated a significant effect: support surfaces (active versus other comparison [risk ratio=0.54, $p = 0.005$, $I^2 = 43\%$] and standard surfaces [risk ratio = 0.31, $p < 0.001$, $I^2 = 0\%$]; and reactive versus other comparison surfaces [risk ratio = 0.53, $p = 0.03$, $I^2 = 64\%$]) and heel protection devices versus standard care (risk ratio = 0.38, $p < 0.001$, $I^2 = 36\%$).

DISSEMINATION: the systematic review protocol was registered with PROSPERO International. Q1 publication in *International Journal of Nursing Studies*.

FUNDING: Part-funded by The Prince Charles Hospital Foundation, PhD scholarship, \$82,788.

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that the incidence may be significantly higher in cardiac surgical patients admitted to intensive care.

FUNDING: in-kind.

DISSEMINATION: the systematic review protocol was registered with PROSPERO International. Q1 publication in *International Journal of Nursing Studies*.

Validity of pressure injury staging/categorisation by hospital staff: a retrospective quality audit

^aPaul Fulbrook, ^aJosephine Lovegrove, ^aSandra Miles,

The aim of this study was to determine the accuracy of pressure injury (PI) staging and reporting made by nursing staff. A secondary analysis of hospital PI incident and validation data was undertaken. All PIs (hospital-acquired and present-on-admission) that were reported in adults (≥ 18 years) between 2016-2019 that were subsequently validated by nurse-validators were analysed. Of 6186 PIs that were analysed, the stage/category was reported correctly in 67.3% ($n = 4163$), with an overall moderate level of inter-rater agreement by stage/category ($K = .567$, $p < .001$). Of those found to be non-PIs when validated (18.3%), most were reported originally as either stage II (41.2%) or stage I (30.5%), and 13.4% were categorised initially as unstageable. The majority of injuries reported initially as stage I, stage II, suspected deep tissue injury, or mucosal PI were validated as being correct, whereas only half of those reported initially as stage III or stage IV were correct and less than a third of those reported initially as unstageable PIs were correct.

DISSEMINATION: A publication is under review with a Q1 journal.

FUNDING: in-kind.

Assessment of pressure injury risk using clinical judgement versus use of a standardised pressure injury risk assessment tool: a systematic review

^aSaroeun Ven, ^aJosephine Lovegrove, ^aSandra Miles, ^aPaul Fulbrook

Some studies have suggested that clinical judgement may be as effective as a structured tool to assess risk of pressure injury. The aim of this systematic review was to systematically analyse available evidence. Five moderate to high-quality studies were included. Synthesis was limited by heterogeneity. Several risk assessment tools and methods of clinical judgement were used. Three studies reported pressure injury risk status using both assessment approaches, but in only one did nurses undertake both. Risk status, as identified by each method, varied and was sometimes contradictory. Three studies reported some elements of preventive intervention prescription and/or implementation following risk assessment, but comparison between approaches was limited. Risk status was not well linked to preventive interventions.

DISSEMINATION: the systematic review protocol was registered with PROSPERO International. Q1 publication in *Journal of Clinical Nursing*.

FUNDING: in-kind.

Pilot study: evaluation of a silicone gel adhesive hydrocellular foam dressings for the prevention of sacral pressure injuries in hospitalised elderly patients

^aJosephine Lovegrove, ^aPaul Fulbrook, ^bDamian Williams, ^aSandra Miles

The aim of this pilot randomised controlled trial was to inform a future trial to compare the effectiveness of a prophylactic sacral dressing plus standard care to standard care only to reduce sacral PI in at-risk older adults admitted to hospital. Patients aged ≥ 65 years and at-risk of pressure injury were recruited and randomly allocated 1:1 to the intervention (prophylactic dressing plus standard care) or control group (standard care only). Ward and research staff collected data and assessed skin integrity daily. Retrospective chart reviews were undertaken to verify data. 130 participants were randomised (intervention $n = 66$; control $n = 64$). Protocol violations were noted in 48 participants (intervention $n = 33$; control $n = 15$). Two intervention (3.0%) and one (1.6%) control participant developed a sacral pressure injury. The difference was not statistically significant. Only one PI was recorded prospectively, while two PI were identified via chart review. Participants rated dressing comfort highly, particularly during the first two weeks, and nurses rated utility highly. A sample size of 1799 per arm would be required in a definitive trial. A definitive trial is feasible and warranted, but for such a large sample size to be achieved in a reasonable timeframe, multiple sites would be required.

DISSEMINATION: the protocol has been registered with the Australian and New Zealand Trials Registry. Q1 publication accepted in *Journal of Wound Ostomy and Continence Nursing*.

FUNDING: Smith and Nephew, \$12,141.

A meta-synthesis of the experience of living with a pressure injury: the perspectives of the patient and carers

^aAdam Burston, ^aSandra Miles, ^aPaul Fulbrook

This meta-synthesis aims to explore the experiences of both patient and carer when encountering a pressure injury. Pressure injuries are known to generate a range of psychological, social and economic effects for patients and their carers, although qualitative research exploring these experiences is limited. Twelve studies met inclusion criteria. Meta-synthesis led to the construction of three primary themes: autonomy and independence, psychological effects, and adjustment. Within these primary themes, sub-themes of; dependence, social isolation and social avoidance behaviours, feelings and emotions, loss, managing, physical adaptations, service provision, and functional challenges, were identified. The psychology and mindset of those involved, and support to navigate the challenges that arise are critical considerations.

DISSEMINATION: the protocol has been registered with PROSPERO International. A publication is under review with a Q1 journal.

FUNDING: in-kind.

Systematic review and meta-analysis of the effectiveness of pressure injury preventative interventions for intensive care patients

^aJosephine Lovegrove, ^aPaul Fulbrook, ^aSandra Miles, ^aMichael Steele

The overall aim of this study is to identify and assess which interventions (single or bundled) are effective in preventing PI in adult inpatients admitted to intensive care settings. A systematic review protocol was developed and registered with PROSPERO International. Randomised controlled trials which trialled the effectiveness of pressure injury preventative interventions on a primary outcome measure of pressure injury incidence within intensive care settings were included in this review. Overall, 26 trials were included. Ten intervention types were found. Support surface trials were limited within type (active, reactive, seating, other). Meta-analysis was undertaken for reactive surfaces only, but the intervention effect was insignificant (risk ratio 0.24, $p = 0.12$, $I^2 = 51\%$). Meta-analyses demonstrated the effectiveness of sacral (risk ratio 0.22, $p < 0.001$, $I^2 = 0\%$) and heel (risk ratio 0.31, $p = 0.02$; $I^2 = 0\%$) prophylactic dressings for pressure injury prevention. Conclusions: Only prophylactic sacral and heel dressings demonstrated effectiveness in preventing pressure injury in adults admitted to intensive care settings.

DISSEMINATION: the systematic review protocol was registered with PROSPERO International; Q1 publication accepted in *Australian Critical Care*.

FUNDING: Part-funded by The Prince Charles Hospital Foundation, PhD scholarship, \$82,788.

Adhesive silicone foam dressing versus meshed silicone interface dressing for the management of skin tears: a comparison of healing rates, and patients' and nurses' satisfaction

^aPaul Fulbrook, ^aSandra Miles, ^aJosephine Lovegrove, ^bDamian Williams

Point prevalence audits within TPCH between 2009 and 2011 have yielded skin tear prevalence results between 5.4% and 12.6% and 95% of skin tears were on patients over the age of 65. The main goal of this study was to compare two standard dressings in terms of their skin tear healing times. Results from this study suggest that the adhesive silicone foam dressing (Mepilex Border™) is superior as it produces clinically significant healing at 3 weeks compared to the meshed silicone interface dressing (Mepitel One™).

DISSEMINATION: A publication is in preparation.

FUNDING: The Prince Charles Hospital Foundation, \$9,938.

Incidence and characteristics of hospital-acquired mucous membrane pressure injury: a five-year analysis

^aPaul Fulbrook, ^aJosephine Lovegrove, ^aJacob Butterworth, ^aSandra Miles

The aim of this project was to analyse mucous membrane pressure injury incidence and characteristics in TPCH, over a five-year period. A secondary data analysis was undertaken

of hospital clinical incident reports. The sample comprised 414 reports of mucous membrane pressure injury, of which 92% were hospital-acquired; most of these occurred in intensive care patients (74%). Hospital-acquired mucous membrane pressure injury incidence was estimated to be 0.1% (11 mucous membrane pressure injuries per 10000 hospital episodes). In intensive care, the incidence was 2.4% (235 mucous membrane pressure injuries per 10000 intensive care episodes). The median time from device insertion until a mucous membrane pressure injury was reported was 3 days. The most common sites of mucous membrane pressure injury were the lips (36%) and mouth (29%). In all cases except one, the mucous membrane pressure injury was associated with medical device use at the site of injury, while associated device data was not reported in four cases. Five device types were identified (oral endotracheal tube-related 70%; urinary catheter 16%; gastric tube 8%; nasal prongs 4%; tracheostomy tube 2%). In intensive care, oral endotracheal tube-related devices were most often associated with mucous membrane pressure injury (85%), whereas in non-intensive care mucous membrane pressure injury it was the urinary catheter (51%).

DISSEMINATION: A publication is under review with a Q1 journal.

FUNDING: The Prince Charles Hospital Foundation, \$9,811.

An investigational, observational study of the use of thermal imaging to determine patient body position within an acute hospital setting

^aJosephine Lovegrove, ^aPaul Fulbrook, ^aSaroen Ven, ^aSandra Miles, ^bTracy Nowicki, Vladimir Yuzhakov

The aim of this study is to identify and analyse patient body positioning and repositioning when lying in a hospital bed. The information gained from this study may help to design new pressure injury prevention strategies to be used in the hospital and long-term care settings. The technology is based on an innovative neural network object recognition that is able to automatically recognise body position with a very high degree of accuracy, and is not effected by lighting conditions. Over 1500 hours of patient data have been collected successfully. Preliminary results confirmed the technical and operational feasibility of using thermal sensors to gather, process, and extract patient data in a hospital setting. The patient position data are currently being analysed.

FUNDING: In-kind.

Prevalence and incidence of mucosal pressure injury in hospitalised adults: a systematic review

^aPaul Fulbrook, ^aSandra Miles, ^aJosephine Lovegrove, Ban Isaqi

The aim of this systematic review was to identify and evaluate primary research studies which reported the prevalence or incidence of mucosal pressure injuries (MMPI). Searches were conducted between 2008 and 2019. Twenty-one studies met inclusion criteria; most provided incidence data. No studies were found that specifically

reported MMPI incidence or prevalence. It was possible to calculate incidence or prevalence from four studies; all were in intensive care settings. MMPI incidence of 0.8% and 30.4%, and prevalence of 1.7% and 3.7% were found. One study provided data that enabled calculation of prevalence of 0.1% in a non-intensive care sample. Only one other study provided specific data about MMPI. It is concluded that there is insufficient evidence available to enable estimation of MMPI incidence or prevalence in either acute hospital or intensive care settings.

DISSEMINATION: the protocol has been registered with PROSPERO International. Q1 publication in *International Wound Journal*.

FUNDING: in-kind.

Assessment of pressure injury risk and intervention: nurses' clinical judgement with and without use of a standardised pressure injury risk assessment tool

^aJosephine Lovegrove, ^aPaul Fulbrook, ^aSandra Miles, ^aSaroen Ven

Many people admitted to hospital are at risk of developing a pressure injury. Currently, TPCN nurses use a standardised tool to assess risk, which can be relatively time-consuming to complete. Also, some studies have suggested that clinical judgement may be as effective. The aim of this study is to compare nurses' use of a structured risk assessment tool versus clinical judgement to determine which results in the most effective planned interventions to prevent pressure injury. Initial analysis of pilot data indicate that agreement between nurses is fair. Data collection is in progress across six hospital wards.

FUNDING: The Prince Charles Hospital Foundation, \$9,796; ACU Faculty Grant, \$7,431.

Implementation of an intensive care-specific pressure injury risk assessment scale and preventative intervention bundle: a before and after study

^aPaul Fulbrook, ^aJosephine Lovegrove, ^aAdam Burston, Cindy Weatherburn (Royal Hobart Hospital), Rick McAllister (Royal Hobart Hospital), Ellen Burke (Royal Hobart Hospital)

The primary aim of this Tasmanian study is to identify whether a change in intensive care nursing practice i.e. implementation of the COMHON Index pressure injury risk assessment tool with bundled preventative interventions by risk level, results in reduced PI incidence. A secondary aim is to assess compliance with the change in practice in the after phase. The results from this project will demonstrate whether the change in practice has reduced PI incidence within the study unit and will be used to further improve PI prevention practice locally and within the community more broadly through the dissemination of results. Specifically, the results will provide information to assist in the determination of the effectiveness of a risk level-based PI prevention care bundle to reduce PI occurrence within intensive care.

FUNDING: in-kind.

Development and validation of the COMHON Index pressure injury risk assessment tool: Chinese version

^aJosephine Lovegrove, ^aPaul Fulbrook, ^aSandra Miles, ^aMichael Steele, Angel Cobos Vargas (San Cecilio University Hospital), Lin Zhang (10th People's University of Tongji University), Xian-Lang (Daniel) Liu (Charles Darwin University)

Pressure injuries are mostly avoidable with the use of preventative measures. Pressure injury prevention begins with a risk assessment, which is then used to guide the selection and implementation of preventative interventions; thus, risk assessment underpins the prevention process. However there are few scales which are specific to intensive care. Consequently, these scales do not account for pressure injury risk factors specifically associated with critical illness and intensive care admission. The COMHON Index is one risk assessment scale which was developed specifically for intensive care, and it has been matched with a set of preventative interventions for use at the risk levels identified by the scale. However, prior to this study, the COMHON Index had not yet been formally translated into Chinese, nor had it been tested in this setting. This study has formally translated the COMHON Index into Chinese Mandarin and will test the reliability of the translated scale within a Chinese intensive care setting. Ethical approval has been received in China and Australia, and the reliability study will commence soon. Future research will test the effectiveness of the COMHON Index, matched with the set of preventative interventions for different risk levels, on the occurrence of pressure injury in international intensive care units, including Chinese intensive care units.

DISSEMINATION: Q1 publication accepted in *Australian Critical Care*

FUNDING: in-kind.

Implementation and evaluation of multi-layered pressure injury prevention strategies in an Australian intensive care setting

Fiona Coyer (QUT), Anna Doubrovsky (QUT), Jane-Louise Cook (QUT), Jill Campbell (RBWH), Amanda Vann (RBWH), Greg McNamara (RBWH), Karen-Leigh Edward (Swinburne University of Technology), Gunter Hartel (QMIR), ^aPaul Fulbrook

The aim of this study was to implement targeted evidence-based pressure injury (PI) prevention strategies and evaluate their effect through measurement of patient PI observations. A prospective multiphased design was used in an Australian intensive care unit, using three study periods. The interventions included staff-focused interventions and patient-focused interventions, with the latter defined in a work unit guideline. Weekly visual observations of critically ill patients' skin integrity were conducted by trained research nurses over 52 weeks. The primary outcome measure was a PI of any stage, identified at the weekly observation, and the effect of the intervention was evaluated through logistic regression. Over the whole study, 15.4% of patients developed a PI, with the majority of these injuries (73.2%) caused by medical devices. After adjustment for covariates

known to influence hospital-acquired PI development, PI rates for period 3 compared with period 1 were reduced significantly (odds ratio 0.41, $p = 0.013$). We concluded that the use of defined PI prevention strategies targeted at both staff and patients reduced PI prevalence.

DISSEMINATION: Q1 publication accepted in *Australian Critical Care*.

FUNDING: in-kind.

Pressure injury prevention in ICU: a national survey

Fiona Coyer (QUT), Annabel Levido (RBWH), ^aPaul Fulbrook, Sharon Latimer (Griffith University), Rachel Walker (PAH), Jill Campbell (RBWH), Michelle Barakat-Johnson (University of Sydney)

The aim of this study is to examine and describe the nature and extent of pressure injury (PI) prevention practices in Australian public adult intensive care units (ICUs). The study employed a cross sectional survey design, using structured telephone interviews. Of the 75 eligible ICUs in Australia, 70 responded (93% response rate). PI was considered problematic in two thirds (68%). Common PI prevention strategies included risk assessment and visual skin assessment conducted within at least 6 hours of admission (70% and 73%, respectively), a structured repositioning regimen (90%), use of barrier products to protect the skin (94%), sacrum or heel prophylactic multilayered silicone foam dressings (88%), regular PI chart audits (96%), and PI quality improvement projects (90%). PI prevention rounding and safety huddles were used in 37% of ICUs, and 31% undertook PI research. Although most ICUs were supported by a facility-wide skin integrity service, it was more common in metropolitan ICUs than in rural and regional ICUs ($p < 0.001$). Conversely, there was greater involvement of occupational therapists in PI prevention in rural or regional ICUs than in metropolitan ICUs.

DISSEMINATION: Q1 publication accepted in *Australian Critical Care*.

FUNDING: in kind.

Incidence and characteristics of medical device-related pressure injury in adult intensive care patients

^aPaul Fulbrook, ^aJosephine Lovegrove, ^aVainess Mbuzi, ^aJacob Butterworth, ^bBarbara Taylor

The primary aim of this study is to describe the three-year incidence of ICU-acquired medical device-related PI in adult patients admitted to intensive care. Descriptive statistics will be used to describe the patient demographics and characteristics, summarise the data and describe the proportions of hospital-acquired PI, medical device-related PI and mucosal PI. The results of this study will provide evidence to contribute to research knowledge about medical device-related ICU-acquired PI. It will also provide benchmarking data and help inform clinical practice guidelines and policy development. Data analysis is in progress.

FUNDING: in-kind.

FALLS PREVENTION AND MANAGEMENT

NSQHS Standard 5: Comprehensive Care

Evaluation of short-form screening of falls risk in Australian emergency department presentations following a fall to determine need for follow-up

^a Paul Fulbrook, ^a Sandra Miles, Bridie McCann, ^a Michael Steele

The aim of this study was to evaluate the use of a brief screening tool to assess falls risk factors and determine the need for further assessment within the emergency department. Participants presenting to the emergency department with a fall-related injury or disease ($n = 250$) were recruited. Following randomisation (1:2), a brief screening tool, comprised of sections of several falls-risk-related assessment tools, was completed. The median time-to-screen was 10 minutes. A total of 1154 referrals for further assessment of falls risk were generated, and only 3 participants did not generate any referrals at all. A significantly greater proportion of referrals was generated in the ≥ 70 years age group ($p < .001$). Most referrals were generated for social and housing (18%), function and mobility (17%), or polypharmacy risks (15%). Of four screening components used to assess function and mobility, a referral was triggered in 46% of participants but most of these (88%) would have been triggered using only two components. Brief screening in the emergency department, using a multi-component tool, was found to be time-efficient. In particular, the screening highlighted those patients needing further assessment and potential admission for neuro-medical problems and those who would benefit from further physiotherapy assessment and/or intervention in the emergency department. Screening also highlighted patients for whom hospital admission for further assessment may not be needed.

DISSEMINATION: A research article is under review in a Q1 journal.

FUNDING: The Prince Charles Hospital Foundation, \$9,762.

Fast screening and assessment in the emergency department: a clinical innovation to prevent falls in older people

^a Paul Fulbrook, ^a Sandra Miles, ^b Nicole Bellet, ^b Hwee Yong (Debbie) Lee, ^b Greg Morrison, ^b Benjamin Cameron, ^b William Dang, ^b Lizelle Lumb, ^a Josephine Lovegrove, ^a Adam Burston

The aim of this project is to implement and evaluate an interdisciplinary program within the emergency department (ED) to identify, screen and treat people that have fallen: the Emergency Department Falls Pathway (ED-FP). As a result of an initial nurse-led screening process, fallers will be referred to relevant health professionals and within a short space of

time will receive an expedited clinical review whilst within ED that is focused on their recurrent falls risk. As well as providing immediate treatment focused on the fall, this will enable a falls prevention plan to be initiated within the ED for patients that can be safely discharged home, with referral for appropriate community support. Data collection is on hold due to COVID-19 restrictions but will commence soon.

FUNDING: The Prince Charles Hospital Foundation, \$48,950.

OTHER RESEARCH

Developing clinical activities to improve physical activity and reduce stress by improving sleep patterns in student and new graduate nurses

^a Peter Le Rossignol, ^a Adam Burston, ^a Sandra Miles, ^a Roger Lord, Gill Lewis, Paula Schulz, ^a Paul Fulbrook

The primary aim of this study is to measure the physical activity, sleep patterns and stress levels of university student nurses and early nursing graduates in the workplace, to improve their understanding of their level of efficacy in these areas. The secondary aim is to assist nurses develop strategies that will help them improve their functional fitness and reduce their occupational stress. Findings from this study will be used to improve the planned activities for undergraduate clinical nursing placements in the ACU/TPCH clinical school and TPCH graduate transition programs to improve nurses' readiness for graduate practice.

FUNDING: in-kind.

Establishing nursing and midwifery Research issues, BRiGht lights and sacred Cows; A cross sectional survey in one Australian health service district (The RUBRIC study)

Flona Coyer (QUT), Kim Alexander (QUT), Ben Ballard (Caboolture and Kilcoy Hospitals), Andy Carter (RBWH), Dale Dally-Watkins (RBWH), Nathan Dart (RBWH), Clint Douglas (QUT), Jed Duff (QUT), ^b Cherie Franks (TPCH), ^a Paul Fulbrook, Nicole Gavin (MN Community & Oral Health), Samantha Keogh (QUT), Nicole Marsh (QUT), Anna Doubrovsky (QUT)

The purpose of this study is to identify and prioritise areas where there are gaps to best evidence to guide practice, to identify effective evidence-based practice innovations and lessons learnt from practice areas that are considered not effective. This study will use a cross sectional survey design, to gather information from the defined study population at a single point in time. We will survey all registered nurses and midwives in middle and senior leadership roles across one hospital and health service district in Queensland, Australia. Findings of this study will inform clinicians' practice and highlight areas of future research.

FUNDING: in-kind.

Publications

Publications 2021

^aLovegrove J, ^aFulbrook P, ^aMiles SJ, ^aSteele M (2021). Effectiveness of interventions to prevent pressure injury in adults admitted to acute hospital settings: a systematic review and meta-analysis of randomised controlled trials. *International Journal of Nursing Studies* 122 (2021), 104027, 1-28. <https://doi.org/10.1016/j.ijnurstu.2021.104027>.

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Coyer F, Cook J-L, Dubrovsky A, Campbell J, Vann A, McNamara G, Edward K-L, Hartel G, ^aFulbrook P (2021, accepted for publication). Implementation and evaluation of multi-layered pressure injury prevention strategies in an Australian ICU setting. *Australian Critical Care*.

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Published protocols 2021

Wang Y, ^aFulbrook P, ^aMiles S, ^aLovegrove J (2021). Reliability of nurses' assessment of pressure injury staging: a systematic review. PROSPERO 2021 CRD42021135005 Available from: https://www.crd.york.ac.uk/prospere/display_record.php?ID=CRD42021135005

^aFulbrook P, ^aMiles S, ^aVen S (2021). Nursing assessment of pressure injury risk levels of hospitalised patients using clinical judgement alone versus the use of a structured risk assessment tool: a systematic review. PROSPERO 2021 CRD42021224747 Available from: https://www.crd.york.ac.uk/prospere/display_record.php?ID=CRD42021224747.

Research Ethics Approvals

HREC/2021/QPCH/74917

Pressure injury preventative intervention use following the integration of a risk level-based prevention bundle into practice: a cross-sectional audit

HREC/2021/QPCH/80804

Incidence and characteristics of medical device-related pressure injury in adult intensive care patients

HREC/2021/QPCH/72498

Developing clinical activities to improve physical activity and reduce stress by improving sleep patterns in student and new graduate nurses

ACU/2021-17H

Pressure Interrater reliability, agreement and concurrent validity of a pressure injury risk assessment scale (the COMHON Index) in a Chinese intensive care setting

HREC/2021/QRBW/81820

Establishing nursing and midwifery Research issues, BRiGht lights and sacred Cows; A cross sectional survey in one Australian health service district (The RUBRIC study)

Nursing Research
and
Practice Development
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