

Research Conference Program

Tuesday 27th November

School of Nursing Simulation Centre Room J201

- 10.00-10.30** **Arrival & morning tea**
- 10.30-11.00** **Welcome, overview of conference:
A/Prof Denise Fassett**
- 11.00-12.00** **Guest Speaker: Professor Mary Fitzgerald
"Clinical Research"**
- 12.00-12.45** **Dr Peter Arvier
"Training emergency medicine doctors for rural and regional
Australia: What is the future?"**
- 12.45-1.30** **Lunch** (*foyer*)
- 1.30 – 3.10** **Concurrent Session 1 - Student presentations
Hi Fidelity Apartments J104, J106**
- 3.10-3.30** **Afternoon tea**
- 3.30 – 4.00** **Concurrent Session 2 - Student presentations
Hi Fidelity Apartments J104, J106**
- Room J201*
- 4.00-5.00** **Provocation followed by wine & cheese**
*A/Prof Eliza Snow, Dr Peter Orpin, A/Prof Sue Kilpatrick,
Ms Damnhart McCann*
"Should researchers in health strive for understanding or
certainty?"
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- 7.00** **Conference Dinner – The Northern Club**
5/61 Cameron Street, Launceston

Concurrent Sessions Tuesday 27th

J104

Session 1

1.30-2.00

Kathryn Terry

Supervisors

Rosalind Bull, Denise Fassett

An exploration of how the ANMC National Competency Standards for Registered Nurses are understood by nurses and how that understanding is translated when teaching and assessing nursing students

2.05-2.35

David Lees

Supervisors

Denise Fassett

Connectedness and therapeutic alliance in relation to mental healthcare and suicide prevention

2.40-3.10

Robyn Kelly

Supervisors

Denise Fassett, Yvonne Hauck

To investigate the formation of perinatal curricula across Tasmania's maternal health services using an ethnographical approach

J104

Session 2

3.15-3.45

Amanda Reilly

Supervisors

Rosalind Bull, Denise Fassett

Transfer of learning from high fidelity simulation to the clinical setting in Undergraduate Nursing Education

J106

Session 1

1.30-2.0

Peter Mulholland

Supervisors

Judi Walker, Christine Stirling

Evolution of the rural paramedic: bridging the gap between training, education and practice

2.05-2.35

Shelagh Lowe

Supervisors

Rosalind Bull, Judi Walker

The implementation of primary healthcare policy in rural and remote Australia – a place for visionary leadership?

2.40-3.10

Deb Carnes

Supervisors

Erica Bell, Sue Kilpatrick, Michael Hess

The role of reporting error in regards to quality and safety in the clinical setting

J106

Session 2

3.15-3.45

Suzette Seaton

Supervisors

Judi Walker, Mark Reeve

Oxycodone as a component of multimodal analgesia for lactating mothers after Caesarean section

Research Conference Program

Wednesday 28th November

Room J201

- 9.00-9.15** **Welcome and day overview**
- 9.15-10.55** ***Concurrent Sessions 3 - Student presentations***
Hi Fidelity Apartments J104, J106
- 10.55-11.15** **Morning tea**
- 11.15-12.15** **Workshop session 1 –**
 Lab 2 Simulation demonstration
 M218 Sound installation
 J104 Supervisor Session
- 12.15-1.15** **Workshop session 2 –**
 Lab 2 Simulation demonstration
 M218 Sound installation
- 1.15-1.45** **Lunch**
- 1.50- 3.05** ***Concurrent Sessions 4 - Student presentations***
Hi Fidelity Apartments J104, J106
- 3.05** **Afternoon tea**
- Room J201*
- 3.20-4.00** **Group discussion & conclusion**

Concurrent Sessions - Wednesday 28th

J104 **Session 3**

9.15-9.45 **Cassandra Saunders**

Supervisors *Dominic Geraghty, Robert Fassett*
Transient Receptor Potential Vanilloid 1 (TRPV1) and 2 (TRPV2) mRNA and Immunoreactivity in Peripheral Blood Mononuclear Cells of End-Stage Renal Disease

9.50-10.20 **Amanda Crawford**

Supervisors *D. Geraghty, M. Ball, R. Fassett, J. Coombes*
Glutathione peroxidase genotype and enzyme activity in Chronic Kidney Disease

10.25-10.55 **David Koh**

Supervisors *A. Davies, M. Watts, I. Robertson, R. Bull*
A retrospective study to determine if the frequency of accessing a peripheral arterial catheter will have an effect on the incidence of colonization in an arterial catheter

J104 **Session 4**

1.50-2.20 **Kate Squibb**

Supervisors *R. Bull, J. Walker, T. Smith*
Rural radiography

2.25-3.05 **Stephen Bagshaw – Hons presentation**

Supervisors *Damhnat McCann*
The evaluation of the National Inpatient Medication Chart (NIMC)

J106 **Session 3**

9.15-9.45 **Zich Woinarski**

Supervisors *Sue Kilpatrick, John Williamson*
How Government Policy is implemented – from report to what actually happens on the ground

9.50-10.20 **Damhnat McCann**

Supervisors *Rosalind Bull, Tania Winzenberg*
Care of children with complex needs at home

10.25-10.55 **Sandra Campbell**

Supervisors *Judy Sankey, Michelle Woods*
The journey of people with chronic kidney disease (CKD) from diagnosis to commencement of dialysis

J106 **Session 4**

1.50-2.20 **John Henshaw**

Supervisors *J. Walker, D. Geraghty, H. Malcolm*
A study of the effect of skin patch opioids for persistent pain on the use of health services in NW Tasmania: a comparison with oral opioids

An exploration of how the ANMC National Competency Standards for the Registered Nurses are understood by nurses and how that understanding is translated when educating teaching and assessing students of nursing

Kathryn Terry

Introduction: This research study is timely in light of the recommendations of Council of Australian Governments (COAG) from the research report, *Australia's Health Workforce* and the imminent move by July 2009 for national registration and national accreditation. COAG strongly recommended adoption of uniform national registration standards as the benchmark for beginning practice and as the ANMC National Competency Standards are already nationally endorsed, further exploration is highly relevant in the current regulatory debate. How the nursing profession in Australia defines the basic competency of the registered nurse is crucial for the safety of the public and the protection of the nurse. Outcomes of this research will directly affect the understanding of competence and the competency standards. The research findings will potentially improve future assessment of beginning level competence as well the assessment of nursing competence in advanced extended or specialist practice. Research evidence that supports the current paradigm of assessment of competence of nurses is essential to the future of the profession.

Aims: The purpose of this study is to clearly articulate how the *ANMC National Competency Standards for the Registered Nurse* are understood by (i) nurses engaged in teaching and assessing undergraduates of nursing, and (ii) first year graduate registered nurses.

Methods: potential methods include questionnaire and semi-structure interview.

Results & Discussion: research at the stage of completion of the Preliminary Research Plan

Conclusion: Although competencies broadly accepted by the profession there is still contentious debate around how the *ANMC National Competency Standards for the Registered Nurse* are understood, applied and integrated into the tertiary, education, regulatory and workforce sectors.

Evolution of the rural paramedic: bridging the gap in training and education

Peter Mulholland

Introduction: Various models of rural paramedical practice are emerging, and components relevant to rural paramedical curriculum need to be identified to ensure a strong foundation for the training and education of rural paramedics.

Aims: This Masters research compares rural paramedical practice with urban paramedical practice and aims to inform the curriculum for rural paramedics.

Methods: Comparative case study methodology is used. Interviews with both rural and urban paramedics focus on specific work carried out, thoughts on current education and training, and pathways for the future.

Results: Rural paramedics have a strong community based focus, are actively involved in primary health care and are responsible for training support of volunteer personnel. Rural interviews indicate the importance of critical and intensive care skills. Urban paramedics report growth in non emergency cases, and a high level of mental health responses. Both rural and urban paramedics report frustration with lack of continuing education and training.

Discussion: Distinct differences exist between rural and urban paramedical practice. Identification of these differences informs the paramedical curriculum and works toward ensuring the future of rural paramedical practice is founded in appropriate education and training.

Conclusion: The preliminary findings from this study generate support for emerging models of rural paramedical practice and indicate a requirement for rural components in paramedical curricula.

Therapeutic engagement in relation to mental healthcare and suicide prevention

David Lees

Supervisors: Associate Professor Denise Fassett & Associate Professor Nicholas Procter

Suicidal behaviour is often a fatal and particularly distressing and burdensome experience. Tasmania's suicide rate is second only to that of the Northern Territory. Given that most people who die from suicide are men who have a diagnosable mental illness, and amidst the current climate of significant mental health reform in Tasmania, it is appropriate to investigate how care is provided to actively suicidal men, and how it may be enhanced.

Through in-depth interviews with men who are actively suicidal, with their carers in the community, and with the nurses who contribute to their public hospital care, and by relating this knowledge to what is already known, it is anticipated that knowledge relevant to enhancing care provision can be developed.

A rationale for conducting the study, including a summary of the relevant literature, will be presented.

The implementation of primary healthcare policy in rural and remote Australia – a place for visionary leadership?

Shelagh Lowe

Introduction: Recently, there has been significant change in primary healthcare policy focusing on multidisciplinary teams and supporting GPs. Developers and implementers of primary healthcare policy need to understand factors that will impact on its outcomes.

Aims: Explores the context for development of primary healthcare policy and implementation at an organisational level.

Methods: Taking a particular organisation as a case study, data has come from a review of documents, individual interviews and the literature.

Results: The organisation underwent a period of major change in function, size, governance structure and name, over a period of 5 years, from 2000. The changes were driven and managed by a leadership team, with members of the team having different skills and roles. Strategies relating to change management and organisational development were utilized.

Discussion: New policy is a top down approach to change. Implementation occurs at the grassroots, largely by local organisations where change management is part of organisational development. To achieve a successful outcome a clear vision and model of how a new service will look and be implemented, or how the organisation will look/function as a result of the change, should exist. To be effective, leadership is required that develops the vision and translates it to other participants.

Conclusion: The effectiveness of Australian Government primary health care programs created by governments will be influenced locally by the people involved in the organisation charged with implementation.

Mental health promotion in perinatal education

Robyn Gail Kelly

Aims: To investigate the formation of perinatal curricula across Tasmania's maternal health services using an ethnographical approach.

Background: There are limited studies that examine the construction of perinatal curricula, particularly curricula based on evidence based practice. Antenatal classes, parenting classes, parent education classes etc. aim to assist parents to adapt well to preparing for parenthood and usually cover such topics as labour and breastfeeding. Some classes also aim to prepare parents for the postnatal period with regard to sleep and settling. However, there has been no comprehensive study looking into how perinatal class curricula is developed in Tasmania; whether founded on evidenced based research, parental feedback or simply the ideas of the midwife taking the classes at a particular moment in time. Ethnography will highlight underlying social and cultural influences and will aid in understanding how curricula is formed. It is hoped that this body of research (PhD) will form the basis of further study, inclusive of previous Master's research to guide the writing and testing of a perinatal syllabus, which will have at its aim the incorporation of Antonovsky's Salutogenic Model to examine parental stressors.

Method: Although it is anticipated that the research methodology will be refined during the first year of study, the greater part of the research will fall under ethnography.

Initial Plan: Stage One: Systematic review of perinatal curricula development internationally, nationally and local.

Stage Two: Meet with Tasmanian maternal services health professionals, parents and interested (significant) others – focus groups re how curricula is developed and needs of service users

Stage Three: Write up of information gathered as basis for future study and disseminate findings to maternal health services for use in planning.

The role of reporting error in regards to quality and safety in the clinical setting

Deb Carnes

This is a research work in progress!

Aims:

The presentation will review some of the literature in relation to the reporting or error and adverse events and the importance of this in relation to quality and safety within health care.

The presentation will consider the potential for researching the following:

- How does organisational resilience contribute to building the reporting of error in rural emergency department/outpatient clinical settings?
- How can prospective modelling be used as a method of assessing this?

The outcome of a research project such as this has relevance to four areas – the rural clinical setting, the general ED setting, prospective modelling theories and a possible relevance to the broader subject of error management across health and other industry.

Transfer of learning from high fidelity Simulation to the clinical setting in Undergraduate Nursing Education

Amanda Reilly

High fidelity simulation as a means of educating health care students and professionals is increasingly recognised as a natural progression from the once traditional means of learning and teaching. The output for research in this area in the last two years has been rapid. Yet despite this, the topic of simulated learning is still in the neophyte stages. Research findings in this area thus far demonstrate that students experience; increased confidence to practise in clinical areas and they appreciate the opportunity to practice reiteratively without risk to themselves or patients. In addition, there is demonstrated improvement in skill when students are able to practice continuously and with alternative scenarios. However, the degree to which knowledge, competence and decision making are transferred from the simulated context to the clinical setting is unknown in health care. To move forward into a new health care education era, this knowledge is fundamental in informing stakeholders of the extent that simulation using high fidelity technology has to play in education. This PhD research investigates the level of transfer of higher order thinking skills from simulated contexts to clinical settings.

Research Questions: How do nursing undergraduate students transfer higher order thinking skills from the simulated context to real world clinical settings?

1. What is the contribution of high fidelity simulation to the development of undergraduate student's of nursing clinical competence?
2. How does skill and decision making in relation to simulated patient care transfer to similar scenarios in the clinical setting.
3. How does skill and decision making in relation to simulated patient care transfer to unfamiliar scenarios in the clinical setting.

Methods: This PhD research is in the first year of development. The proposed research method will be a case study, utilising data collection tools of survey and focus groups. The purposeful sample group will be second year undergraduate nursing students enrolled in the clinical practice unit of the Bachelor of Nursing, at the School of Nursing and Midwifery.

Oxycodone as a component of multimodal analgesia for lactating mothers after Caesarean section

Suzette Seaton, B. Pharm

Introduction:

Anecdotal evidence had suggested that oxycodone had become popular for post-Caesarean analgesia. There were no documented statistics on the use of oxycodone for post-Caesarean analgesia in Australasian practice. There was very limited knowledge on excretion of oxycodone into breast milk and it was not recommended for use in breastfeeding mothers.

Aims: To determine current practice for post-Caesarean analgesia Australian and New Zealand obstetric units. To investigate the relationship between maternal blood levels and milk levels of oxycodone during the 72 hours post partum.

Methods: Forty-one obstetric units were invited to participate in an on-line survey to determine analgesia preference post-Caesarean.

Fifty, breastfeeding mothers taking oxycodone, post-Caesarean had blood and breast milk samples taken at 24 h intervals postpartum. Forty-one neonates had blood samples taken at 48 h or 72 h post delivery.

Results: Eighty-four percent of units surveyed used a system of multimodal analgesia which included oxycodone. Oxycodone was detected in the milk of mothers who had taken any dose in a 24 h period. The median of the M:P ratios in the 0-24 h period was 3.2:1. Oxycodone levels up to 168 ng/ml were detected in breast milk (20 percent of subjects > 100ng/ml).

Conclusions: Oxycodone is a popular analgesic choice as a component of multimodal analgesia post-Caesarean section. Oxycodone is concentrated in human breast milk up to 72 h postpartum. Breast fed infants could receive > 10% of a therapeutic infant dose, however maternal oxycodone intake, post Caesarean section, up to 72 h postpartum is probably safe because low volumes of breast milk are ingested during this period.

Transient Receptor Potential Vanilloid 1 (TRPV1) and 2 (TRPV2) mRNA and Immunoreactivity in Peripheral Blood Mononuclear Cells of End-Stage Renal Disease Patients

Cassandra IM Saunders

Introduction: The transient receptor potential vanilloid (TRPV) family of cation channels includes the universal integrator of inflammatory signals TRPV1 and noxious heat-activated TRPV2. Patients with end-stage renal disease (ESRD) are in a constant state of inflammatory oxidative stress.

Aims: The aim of the present study was to determine whether TRPV1 and TRPV2 mRNA expression and immunoreactivity in peripheral blood mononuclear cells (PBMC) is altered in ESRD patients compared to non-renal impaired controls and to determine whether TRPV1 and/or TRPV2 message and/or immunoreactivity in PBMC is an indicator of oxidative stress/systemic inflammation.

Methods: Quantitative real-time polymerase chain reaction (qRT-PCR) and immunocytochemistry were used to detect mRNA and immunoreactivity, respectively.

Results: TRPV1 and TRPV2 mRNA expression (copies per 10^6 copies of the housekeeping gene, GAPDH) was similar in ESRD patients and controls (TRPV1, $11.9 \pm 1.18 \times 10^2$ and $11.3 \pm 1.02 \times 10^2$, respectively; TRPV2, $1318 \pm 186 \times 10^2$ and $1577 \pm 199 \times 10^2$, respectively). A significant inverse correlation between age and TRPV1 mRNA was observed in controls ($p < 0.05$), while TRPV2 mRNA was not associated with age. The intensity of TRPV1 immunoreactivity was significantly greater (48%) in ESRD patients (1.19 ± 0.07) compared to controls (0.62 ± 0.04) ($p < 0.05$). TRPV2 protein, however, was significantly decreased (32%) in ESRD patients (0.013 ± 0.001) compared to controls (0.019 ± 0.001) ($p < 0.05$).

Conclusion: Over-expression of TRPV1 channels may make PBMC more sensitive to many inflammatory mediators and increase susceptibility to apoptosis. These findings provide some explanation as to why ESRD patients have low white blood cell counts and impaired immune function.

A Discussion on Policy Implementation

Zich Woinarski

One of the interesting part of my research has been the consideration of policy evolution, especially at a Federal Government level. Being in possession of original documents, it is interesting to see how Government policy evolves from concept to implementation. This has implications for Researchers but mor importantly communities who may have to implement a policy which does not reflect the original intention.

This research discusses the implementation of the "Kirby Report" which led to the introduction of the Australian Traineeship system in rural areas, particularly the farming community in Tasmania. It traces the original recommendations and how they were moulded by the Federal Government, altered by the bureaucracy and challenged by the farming community to provide a new form of training. This research has particular importance for rural industries and rural communities in how to address vocational training and education in rural and remote communities. It may also provide a blueprint to address issues in rural health.

Title Glutathione Peroxidase Genotype and Enzyme Activity in Chronic Kidney Disease

Amanda Crawford

Introduction: Antioxidant enzyme polymorphism of glutathione peroxidase (GPx) P197L has been associated with cancer and diabetes. However, the link between GPx polymorphisms and chronic kidney disease (CKD) has yet to be investigated.

Aims: The aim of this study was to compare the antioxidant enzyme genotypes of GPx in CKD patients with controls without CKD and to determine their relationship with GPx activities.

Methods: Two hundred and twenty one CKD patients (stages 3-4) and 73 controls with no history of renal disease were assessed for the P197L GPx polymorphism as well as plasma and erythrocyte GPx activity. The P197L GPx genotype was determined using a restriction fragment length polymorphism -PCR assay and the GPx activities were measured by a colorimetric assay. (statistical analysis of the results was by GLM and logistic regression using STATA 9.2).

Results: Homozygote wildtype (Pro/Pro) frequency was lower in CKD patients (CKD = 46%, control 59%) and the frequency of the heterozygote genotype (Pro/Leu) was higher (CKD = 52%, control = 41%) (OR= 1.67; CI95% 0.98 to 2.86; p value = 0.061). Plasma GPx activity was significantly ($p < 0.05$) lower in CKD patients (mean \pm SD, CKD = 586 ± 184 , control = 828 ± 119 U/L) but erythrocyte GPx activity was higher ($p < 0.05$) (CKD = 105 ± 34 , control = 81 ± 21 U/gHb).

Discussion:

Conclusion: The data suggest an abnormal GPx genotype distribution in CKD patients and shows that GPx enzyme activities are significantly different in CKD patients compared to non-CKD controls.

Care of children with complex needs at home

Damhnat McCann

Introduction: Advances in health care and ongoing improvements and developments in health technologies have led to increasing numbers of children with severe disabilities requiring complex care at home.

Aims: This research aims to explore the daily experience of parents caring for a child with complex needs at home. A secondary aim is to identify the respite needs of parents caring for these children and the most effective method of delivering respite care for these families.

Methods: This research is in a very preliminary stage and methods of data collection are still being finalised. A mixed methods approach, predominantly quantitative, is proposed. A Cochrane systematic review will be conducted. Weekly diaries will be used to capture information relating to parental time usage. The experiences of a small number of parents will then be explored qualitatively.

A retrospect study to determine if the frequency of accessing a peripheral arterial catheter will have an effect on the incidence of colonization in an arterial catheter

David Koh

Introduction: Peripheral arterial catheters (ACs) provide a convenient access for repeated blood sampling for arterial blood gas analyses (ABG) in the critically ill [1-6]. They are however perceived as having low infective potential, and often overlooked as a cause of catheter-related bloodstream infection (CRBSI).

Aims: To determine if the frequency of accessing an arterial catheter may have an effect on the incidence of colonization in an AC.

Design: Retrospective study

Methods: Data of ACs were sourced from a previous study examining 321 ACs [7]. Intensive Care Unit (ICU) clinical charts from the medical histories of patients were examined for the number of times a patient had an ABG done during admission to the ICU of the Launceston General Hospital. The data was recorded in an *Excel* spreadsheet, and the statistics were analysed using *STATA*[™] (Statistics/Data Analysis Version 9.2).

Results: The results indicate that there was no relation in the number of times the ACs was accessed to the incidence of colonization in the ACs.

Discussion: Frequent accessing does not increase the incidence of colonization in ACs. This implies that the colonization of ACs through the intra-luminal route is low when recommended CDC protocols governing the management and care of ACs are adhered to. Future research examining the rate of colonization on the extra-luminal surface of the AC will be conducted.

Conclusion: The frequency of accessing an AC does not potentially predispose the AC to a higher incidence of colonization.

The journey of people with chronic kidney disease (CKD) from diagnosis to commencement of dialysis.

Sandra Campbell

The incidence of chronic kidney disease (CKD) is on the increase. This research project aims to illuminate where people with CKD access information related to preservation of kidney function and what decisions are made with that information. Identification of significant points of contact with health care professionals along this journey will enable nurses to develop a clearer understanding of where nurses can have a greater influence on preventive health for the future nursing care of people with CKD. This presentation will explain the researcher's positioning within the problem, preliminary progress made which has included a search for an appropriate qualitative methodologically suited to achieve the aim of the study.

Rural radiography, radiographic interpretation and disclosure of radiographic opinion

Kate Squibb

Introduction: The review of the literature resulted in formulation of the hypothesis that rural radiographers operate within an interpretative and bioethical paradigm for which they may be under prepared.

Aims: The aim of the study is to examine disclosure of radiographic diagnosis in rural radiography because the opportunity exists with the imminent emergence of new professions to address these issues, especially as these professions are aimed at filling niche positions in rural areas.

Methods: This is a two stage, multi-method study. Stage 1 is gathering information from radiographers currently practicing in rural areas and will employ surveys, interviews and focus groups. The second stage of the study is contingent upon the first. Stage 2 will comprise of a focus group of non radiographers providing radiographic services in rural areas.

Conclusion: Stage 1 of data collection has commenced with distribution of surveys, but it is too early in data collection to draw any meaningful conclusions.

A study of the effect of skin patch opioids for persistent pain on the use of health services in NW Tasmania: a comparison with oral opioids

John Henshaw

Introduction: Persistent (non cancer) pain is increasing as the population ages, due mainly to the increase in spinal degeneration from osteoarthritis and osteoporosis. These severe pains often respond to opioid medicines, and this may be the safest option.

Aims: To find whether opioid using persistent pain patients need less access to health services if they use skin patch preparations.

Methods: Subjects will be given a 12 month diary in which to record each health related visit including the reason for the visit and the resources required. These diary months will be grouped into oral opioid and skin patch opioid months and the use of health services will be compared.

Results: Ethics approval was obtained on the 29th October. I have no subject data at present.

Discussion: As above.

Conclusion: 'For a difference to be a difference it has to make a difference' – Gertrude Stein.

New preparations of existing medicines may improve life for people with chronic disease and persistent pain. We won't know unless we ask them and measure the outcomes.

Evaluation of the National Inpatient Medication Chart (NIMC)

Stephen Bagshaw

Introduction: Errors occurring in the prescription of medications have the potential to cause serious harm in the acute care setting.

Aim: A key aim of the research was to determine whether the rate and severity of medication prescription error had changed post the introduction of the NIMC in 2005.

Methods: The study utilised a descriptive correlational design based on a retrospective audit of medication charts pre and post the implementation of the National Inpatient Medication Chart (NIMC). Medication charts were randomly selected from patients admitted during the months of February 2004 and February 2007 to two medical wards in a 300 bed public teaching hospital. The study was conducted in two phases. Phase 1 encompassed a general audit of prescription quality and completion involving a total of 192 charts from 2007 and 196 from the 2004 (N= 388). In Phase 2, a sub sample of 200 charts (100 charts from each time period) was randomly selected from the original 388 charts and audited by clinical pharmacists to determine the rate of prescription error related to medication name, spelling and dosage and the severity of potential adverse drug events arising from these errors.

Results: Significant medication prescription errors related to medication name, dosage, frequency and patient identification were detected on charts from both 2004 and 2007. There was no improvement detected in the quality of prescription writing post the introduction of the NIMC, highlighted by an increased total error rate in the NIMC compared to the Blue (2004) chart for regular (Incidence rate ratio (IRR) 1.36, $p < 0.001$) and 'when required' (IRR 2.14, $p < 0.001$) medications. The severity and potential impact of detected errors was also measured. The study revealed a significantly higher error rate in the NIMC for all grades of potential drug interactions occurring on the medication chart (IRR 33.652, $p < 0.001$).

Discussion: Medication prescription errors continue to pose a potential risk to the care of medical patients within the acute care setting. Despite the considerable effort to standardise and improve the medication charting system with the introduction of the NIMC, the problem of medication prescription errors associated with a paper based medication charting system has not been alleviated.

Conclusion: Recommendations to reduce the incidence of medication prescription errors include the use of information technology and electronic prescribing systems, and the inclusion of systematic ward education sessions for both medical and nursing staff.