

## Nursing Affiliate Finalists

11

### Access to Cardiac Rehabilitation and Secondary Prevention Services in Australia: Is Geography Really the Issue?

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**Background/Aims:** Timely access is critical for optimising outcomes after a cardiac event. In Australia the overall attendance at cardiac rehabilitation remains low and in some communities' access to basic services for secondary prevention is limited. The Cardiac Accessibility and Remoteness Index of Australia (Cardiac ARIA) is an objective, geographic measure reflecting access to cardiac services.

**Methods:** Geographic information systems (GIS) were used to model the access to four basic services (general practitioner/nurse clinic, pharmacy, cardiac rehabilitation, pathology) within a one hour drive-time from each of Australia's 20,387 population locations. Australian Bureau of Statistics 2006 census data were used to identify key population characteristics within each of the five cardiac aftercare categories A (Access to all services  $\leq 1$  h) to E (No service  $\leq 1$  h).

**Results:** Eighteen percent of the population locations were within category "A" zones with the remaining 82% located in zones with some limitation to recommended services. Sixteen percent (73,000) of the Indigenous population resided in population locations that had access to none or only one service. From the location data we estimated that 96% or 19 million Australians lived within one hour of the four basic services to support cardiac rehabilitation and secondary prevention, including 96% > 65 years and 75% of the Indigenous population.

**Conclusion:** These results demonstrated that the majority of Australians had excellent "geographic" access to services after a cardiac event. Therefore further research is needed to identify which aspects of accessibility other than geographic distance to cardiac rehabilitation affect utilisation of services.

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12

### Acetazolamide Reduces Hospital Admissions and Length of Stay in Refractory Heart Failure Patients

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**Background:** End stage Heart Failure patients with refractory oedema have frequent hospital admissions and

increased length of stay (LOS) with resultant morbidity, mortality and cost, despite optimal medications and devices. Acetazolamide is a carbonic anhydrase inhibitor acting on the proximal nephron resulting in added diuresis to standard therapy.

**Method:** Over four years, 10 patients with refractory oedema and repeated congestive cardiac failure (CCF) admissions despite maximal tolerated medical therapy and use of multiple diuretics were treated with addition of Acetazolamide at either 125 or 250 mg bd for two of every three days. Hospital admissions and LOS for each patient pre and post Acetazolamide were analysed.

**Results:** Ten patients had 34 admissions in 72 months of patient monitoring with LOS 299 days pre Acetazolamide. Over 131 patient months post Acetazolamide there were 20 admissions with LOS 168 days. Mean LOS was reduced from 13.7% to 4.2% (ARR 9.5%, RRR 69%) of days monitored. The five surviving patients at average 13.6 months post Acetazolamide had mean admissions reduced from 3.4 to 1 and LOS reduced from 9% to 1.3% of days monitored (ARR 7.7%, RRR 86%). Mean reduction in LOS for five patients who died (four within 10 months) was from 19% to 7.3% (RR 11.7%, RRR 62%).

**Conclusion:** In end stage heart failure patients with refractory oedema and recurrent CCF admissions, the addition of Acetazolamide to standard diuretic therapy results in significantly reduced admissions and LOS thus reducing morbidity and health care costs.

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13

### Sex Differences in Symptom Presentation in Acute Myocardial Infarction: A Systematic Review and Meta-analysis

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**Background:** Recognition of sex differences in symptom presentation of acute myocardial infarction (AMI) is important for timely clinical diagnosis. We sought to address two research questions in our review: do men and women equally present with chest pain as a symptom of AMI, and are there sex differences in other presenting symptoms of AMI.

**Methods:** A systematic review of research articles published between 1990 and 2009 was conducted using MEDLINE, CINAHL, EMBASE, Cochrane Library, Current Contents and ISI Web of Knowledge. A meta-analysis was performed and summary effect measures were calculated and expressed as odds ratios and risk ratios.

**Results:** Twenty-seven studies met the inclusion criteria. Meta-analysis showed women with AMI had 37% lower odds and a 7% lower rate of presenting with chest pain than men (OR = 0.63, 95% CI 0.59, 0.68; RR = 0.93, 95% CI 0.91, 0.95). Women were significantly more likely than men

to present with fatigue, neck pain, syncope, nausea, right arm pain, dizziness and jaw pain. For most symptoms of AMI, adjusting for age and other variables made no significant difference to the magnitude of the effect.

**Conclusions:** Women are significantly less likely than men to experience chest pain and are much more likely than men to experience other associated symptoms of AMI. We recommend that public health campaigns on symptom presentation of AMI continue to promote chest pain as the cardinal symptom of AMI, but also reflect a wider spectrum of possible symptoms and highlight potential differences in symptom presentation between men and women.

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14

#### Wandering Hearts: Acute Cardiac Management in the Regional Setting

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Evidence has demonstrated the disparity between the burden of disease for rural and urban Australians. Many studies have investigated the cause and ramifications of this disparity. However, few have sought to clarify the efficacy of treatment for rural Australians during an acute myocardial infarction (AMI). Extant literature, related to treatment of cardiovascular disease (CVD), discusses guidelines for treatment and follow-up requirements. A vast majority of this discussion centres on the urban experience. This study investigates concordance with treatment guidelines for AMI from a rural perspective.

A quantitative, retrospective study was undertaken. A review of 204 medical files was conducted, which included all chest pain and angina admissions to a rural base hospital over a 12 month period. The study used a specifically constructed audit tool, which sought to capture patient demographics, clinical findings and concordance with treatment guidelines. Significant correlations between clinical findings and transfer for treatment were analysed using Pearson's Correlations and Regression analysis.

The results indicated that age ( $p < 0.001$ ), employment status ( $p < 0.01$ ) and acute ECG changes ( $p < 0.01$ ) were significant determinants for patients transferred and those patients treated regionally. There was no evidence of differences in medical intervention for those patients transferred when compared to those not transferred. Concordance with consensus guidelines for acute cardiac care ranged from 70 to 79% across both groups. Given that these research findings demonstrate concordance with the treatment guidelines other services that would reduce the need for unplanned cardiac presentations need to be considered.

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#### ISHR/CSANZ Student Investigator Prize

15

#### Chronic Low Dose $\Delta^9$ -Tetrahydrocannabinol Administration Prevents Functional and Electrophysiological Myocardial Changes in SHR and SHR/STZ Rats by Antioxidant and Anti-inflammatory Mechanisms

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It is well established that oxidative stress and inflammation initiate cardiovascular dysfunction associated with poorly managed hypertension and diabetes. The aim of this study was to examine the antioxidant, anti-inflammatory and cardio-protective effects of  $\Delta^9$ -Tetrahydrocannabinol (T) (0.15 mg/kg/day for eight weeks) in two-month-old spontaneously-hypertensive (SHR) and spontaneously-hypertensive-diabetic (SHR/STZ) rats. Rats were randomly assigned to a treatment group and WKY rats were used as controls. SHR and SHR/STZ rats displayed elevated blood pressure, decreased serum levels of nitric-oxide (NO) and increased serum malondialdehyde and IL-1 $\beta$  concentrations. Electrophysiological and functional alterations in SHR and SHR/STZ manifested as prolonged action potential duration at 20%, 50% and 90% (WKY 58.81  $\pm$  3.15; SHR 97.87  $\pm$  5.95\*; SHR/STZ 123.64  $\pm$  9.18\*) of repolarisation, reduced developed and end systolic pressure and reduced rates of contraction and relaxation. T treatments did not decrease blood pressure but improved alterations in NO, MDA and IL-1 $\beta$  concentrations. Improvements in developed pressure, end systolic pressure and maximal rates of contraction (SHR 1078.33  $\pm$  119.4\*; SHR + T 1655.17  $\pm$  125.42\*\*; SHR/STZ 1488.0  $\pm$  211.87; SHR/STZ + T 1813.33  $\pm$  97.67) and relaxation as well as the attenuation of prolonged action potential durations at 20%, 50% and 90% (SHR + T 75.23  $\pm$  5.69\*\*; SHR/STZ + T 94.36  $\pm$  9.93<sup>#</sup>) of repolarisation were observed in T treated SHR and SHR/STZ. These results support the hypothesis that increased oxidative stress, decreased serum NO and systemic inflammation play an integral role in the development of cardiovascular dysfunction in 16-week-old SHR and 16-week-old SHR with eight weeks of induced diabetes. Furthermore, low-dose, chronic, T treatment prevents electrophysiological and functional changes in the myocardium of SHR and SHR/STZ rats by antioxidant and anti-inflammatory mechanisms.

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