The Single Troponin Accelerated Triage (STAT) Chest Pain Study: Results from Phase 1
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Background: The majority of patients presenting to an Emergency Department (ED) with chest pain do not have acute myocardial infarction (MI). In particular, patients who have very low levels of high-sensitivity cardiac troponin (hsTn) at presentation are likely at extremely low risk. The STAT Chest Pain Study is testing the hypothesis that patients who present with very low levels of hsTn (<5 ng/L, Abbott Architect assay) >2 hours after symptom onset can be safely and quickly discharged after a single troponin measurement.

Methods: This is a prospective cohort study recruiting all patients aged >18 yrs presenting with symptoms suggestive of possible MI to Royal Perth Hospital ED, using opt-out consent. In phase 1, patients were managed according to the current CSANZ/NHF recommended chest pain pathway.

Results: 1,251 consecutive patients were enrolled; of these 28% (468) were discharged directly from the ED with the remainder being admitted for further assessment. 73% (911) of patients presented >2hrs from the onset of their symptoms, and of these 701 had an initial hsTn <5ng/L, representing 56% of all patients. None of these patients had an index MI or an MI in the following 30 days.

Conclusions: These data suggest that MI can be confidently excluded in >50% of patients presenting to ED with chest pain after a single hsTn measurement, and the vast majority could be safely discharged without further testing. This is being prospectively tested in phase 2 of the study.

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Hypertension (045-052)

Blood Pressure Variability and Cerebral Small Vessel Disease: a Systematic Review, Meta-Analysis and Meta-Regression
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Background: Recent empirical work demonstrates an association between blood pressure variability (BPV) with stroke and cardiovascular events, however, the association remains controversial. The objective of this study was to systematically review the literature and quantify the bidirectional association between intra-individual BPV and cerebral small vessel disease (CSVD).

Methods: A systematic review of electronic databases was performed on MEDLINE, EMBASE and SCOPUS from inception until September 2018. Eligibility criteria: Population, adult humans (over 18 years but with no upper age limit) without sub-acute stroke <4 weeks from primary care, community cohort, electronic database registry, or randomised controlled trial; Exposure, BPV quantified by any metric over any duration; Comparison, low versus high or mean BPV; Outcomes, 1) prevalent or incident CSVD or progression of CSVD, and 2) standardised mean difference in BPV.

Findings: Twenty-six articles were included describing 25 studies (11,481 unique brain scans, mean age 73.1 years, 48.3% female). Systolic BPV was associated with CSVD (12 studies, OR = 1.29; 95% CI 1.18 to 1.41) and there was marginal evidence of heterogeneity between BPV and mean systolic pressure effect sizes (p = 0.05 for comparison, I² = 74%). Evidence was sparse for diastolic BPV and risk of CSVD (6 studies, OR = 1.30; 95% CI 1.14 to 1.48). Small but significant differences were evident between CSVD populations systolic BPV (15 studies, Hedge’s g = 0.28, 95% CI 0.18 to 0.38) and diastolic BPV (Hedge’s g = 0.13, 95% CI 0.08 to 0.19) without heterogeneity between BPV and mean pressure effect sizes.

Interpretation: The association between BPV and CSVD has implications for blood pressure monitoring and management in people with CSVD.

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Development and Testing of an Evidence-based Education Package to Improve Home Blood Pressure Monitoring Accuracy, Knowledge, Technique and Patient Satisfaction
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Background: Home blood pressure monitoring (HBPM) is becoming ubiquitous to current hypertension diagnosis and management, patients training using evidence-based guideline can help improve the accuracy of their measurements. The aim of this study was to determine the effectiveness of an evidence based, patient-centered education package in improving their HBPM knowledge and technique.

Methods: Eligibility criteria included patients who were currently (or recommended to) performing HBPM, medically stable and not undergoing medication review. The measurement instruments were adapted from published instruments, updated with current recommendations from the Australian Expert Consensus Statement for HBPM. The results from the pre- and post-surveys were then compared to determine the effectiveness of the intervention.

Results: The study recruited 26 participants (18 patients, 8 nurses) from multiple locations across the south-east
Abstracts

Factors Associated with Symptomatic Hyponatraemia from Hydrochlorothiazide in Asian Hypertensive Patients
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Background: Hydrochlorothiazide is a cheap and effective antihypertensive agent. However, it may cause serious symptomatic hyponatraemia. Reported risk factors for hyponatraemia from hydrochlorothiazide include obesity or advanced age. Most of these studies have been conducted in Western countries.

Objective: To evaluate risk factors for hyponatraemia from hydrochlorothiazide in Asian hypertensive patients.

Methods: The study period was between 2005 and 2014. Eligible patients were divided into two groups: those with and those without hyponatraemia. Patients with hyponatraemia were identified using the ICD-10 code E871. Patients in the non-hyponatraemia group were those who had not had any symptoms of hyponatraemia. Patients with hyponatraemia were retrospectively reviewed. Factors that differed significantly between the two groups were analysed using descriptive statistics and logistic regression analysis.

Results: There were 68 patients admitted due to symptomatic hyponatraemia from hydrochlorothiazide. Four independent factors were identified predictive of the occurrence of symptomatic hyponatraemia were demonstrated. Male gender, high body mass index, and high serum albumin were positively related with occurrence (adjusted ORs of 0.099, 0.683, and 0.122, respectively). High plasma glucose levels were positively related with occurrence (adjusted OR of 1.030 (95% CI of 1.009, 1.051)).

Conclusion: Factors related with hydrochlorothiazide-induced symptomatic hyponatraemia in Asian hypertensive patients were gender, body mass index, serum albumin level, and plasma glucose level.

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General Adult Transfer Functions
Underestimate Central Aortic Systolic Pressure in Children and Adolescents when Compared to Age-Appropriate Transfer Functions
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Background: Central aortic pressure can be estimated non-invasively in adults using general transfer functions. Similar techniques have been applied to, but not formally validated in paediatric populations. We recently developed and validated two age-appropriate paediatric transfer functions, and sought to determine their accuracy across childhood and adolescence.

Methods: We recruited 97 healthy children between 2 and 20 years of age in five age-defined, non-overlapping age groups. Central waveforms were estimated by applying two previously developed paediatric transfer functions developed in 8 year and 14 year-old children (8TF, 14TF respectively), and a proprietary adult transfer function (aTF) (Sphygmocor CvMS, AtCor) to radial waveforms measured by tonometry. Accuracy was tested against central waveforms derived from carotid transduction.

Results: Central systolic blood pressure (cSBP) increases with age (1.1 mmHg per year, CI 95% 0.7–1.6). 8TF estimates higher cSBP than 14TF, which estimates higher cSBP than aTF across all ages. The opposite relationship was demonstrated for central augmentation index predicted by each function. 8TF most accurately estimated cSBP in childhood (age groups: 2–6.5 years, −0.8 mmHg [6.6]; 6.6–9.5 years, −0.9 mmHg [7.8]) and in late adolescence (15.6–20 years, 1.6 mmHg [7.3]), while 14TF most accurately estimated cSBP in early adolescence (12.6–15.5 years, −2.2 mmHg [7.1]).

Conclusions: In children and adolescents, aTF underestimates cSBP compared to paediatric transfer functions, possibly explained by a tendency for transfer functions to ‘overfit’ waveforms based on the age of the people in which they were developed. These results support the use of age-appropriate paediatric transfer functions.

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