



**The Irish Institute of
Clinical Measurement Science**

Program

*From Paediatric to Geriatric – The
Scope of patients presenting to the
Clinical Measurement Laboratories.*

**4th Annual Scientific Meeting
and AGM**

**Brook Field Health Science Complex
University College Cork
Sat 8th September 2007**

The committee would like to thank the following companies for their support for the 4th IICMS Scientific Meeting 2007:

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Scientific Program / AGM 2007
Saturday 8th September 2007
Brookfield Health Science Complex, University College Cork

10:30-11:20	Registrations & Coffee
11:20 -11:30	Chairpersons Opening Address
11:30 -12.00	Guest Speaker: Prof David Kerins, Head of the Medical School, University College Cork & Mercy University Hospital, Cork Cardiac MRI, an emerging investigation
12.00-12:15	OSET – The inauguration of the IICMS into OSET in June 2007 Willie Riordan, Neurophysiology, Mater Hospital, Dublin
12:15-12:35	Sleep through the ages Renee Peterson, Respiratory/Sleep Lab, Bons Secours Hospital, Cork
12:35-12:55	Hyperventilation, Just a lot of hot air? Ann Coughlan, Neurophysiology, Our Ladys Childrens Hospital, Crumlin,
12:55- 13:15	Perimembranous VSD Closure Shirley Burrows, Cardiac, Our Ladys Childrens Hospital, Crumlin.
13:15- 13:35	EEG and ECG analysis for the detection of seizures in newborn babies Geraldine Boylan, Department of Paediatrics & Child Health, UCC & Cork University Maternity Hospital
13:35-13:55	American Board Registration of Electroneurodiagnostic Technologists (ABRET) and Laboratory Accrediation Willie Riordan, Neurophysiology. Mater Hospital, Dublin
2pm-2:45pm	Lunch & time to view posters.
2:45-3:15pm	Guest Speaker: Professor Anthony Ryan, Director of Neonatal Intensive Care Unit Cork University Maternity Hospital Title: Clinical Measurement at the Cot Side Prizegiving: Best Platform Presentation Best Poster Presentation
3:15- 4pm	AGM
4pm	Meeting Ends & Refreshments

Cardiac MRI, an emerging investigation

Prof David Kerins, Head of the Medical School, University College Cork & Mercy University Hospital Cork

Magnetic resonance imaging (MRI) is a noninvasive, usually painless medical test that helps physicians diagnose and treat medical conditions. Cardiac MR imaging is performed to help:

- evaluate the structures and function of the heart, valves and major vessels.
- diagnose and manage coronary heart disease and a variety of cardiovascular problems.
- detect and evaluate coronary artery disease.
- Plan a patient's treatment for cardiovascular problems and monitor patient's progress.

Using cardiac MR, physicians can:

- examine the size and thickness of the chambers of the heart.
- determine the extent of damage caused by a heart attack or progressive heart disease.
- detect the buildup of plaque and blockages in the blood vessels.
- assess a patient's recovery following treatment.

The OSET Congress (Italy) 2007 – A Report to the IICMS Membership

Willie Riordan R EEG/EP T

Mater Hospital Dublin

This brief presentation reports on the 2007 Congress of the International Organization of Societies for Electrophysiological Technology (OSET) at which the IICMS was elected to full membership. The vote took place at the open forum of international societies and approval was unanimous. This was the culmination of many hours of hard work by the executive committee of the IICMS and raises the profile of your society on the international scene.

Sleep through the ages

Renee Peterson, Respiratory/Sleep Lab

Bons Secours Hospital, Cork

A review of Sleep and Polysomnography from birth through to old age.

Hyperventilation, Just a lot of hot air?

Ann Coughlan, MSc, Children's Neuroscience Centre.
Our Lady's Children's Hospital, Crumlin, Dublin 12

Baseline physiological measurements, such as ECG, EEG, some PFT's, Ultrasonography and GI functions are usually taken with the body in homeostasis. Activation or challenging procedures are commonly used to disturb the balance of the body's homeostasis, measuring the changes elicited for diagnostic, evaluation, or treatment purposes.

In neurophysiology spontaneous hyperventilation for 3 minutes with the patient in a supine position is routinely used to induce abnormal findings in an otherwise normal EEG, or to enhance pre-existing abnormalities. Hyperventilation provokes physiological slowing of brain rhythms, inter-ictal epileptic discharges, and seizures, especially in generalized idiopathic epilepsies. The literature states that vigorous air exchange, the age of the patient, the level of blood glucose, and posture in which the exercise is carried out all influence the degree of slowing of brain rhythms produced. The maximal hyperventilation response is seen between the ages of 7 and 12 years due to sensitivity of the immature brain to the hypocapnic and pH changes elicited by overbreathing. According to the literature little change can be elicited in an adult subject.

Research into this assumption was undertaken in Our Lady's Children's Hospital, Crumlin. Initially, studying a group of normal adults and currently children with attack disorders a new protocol for Optimal standardised Hyperventilation (OHV) was developed which was proven to be statistically significantly more effective at eliciting high amplitude rhythmic slowing and epileptic activity in the adult and paediatric EEG.

Perimembranous VSD Closure

Shirley Burrows BSc. Cardiology Dept.
Our Lady's Children's Hospital, Crumlin, Dublin 12

The presentation relates to peri membranous ventricular septal defects in the cardiac catheterisation lab.

A perimembranous VSD is the most common type of septal defect. Incidence rates of 1.5 to 3.5 cases per 1000 live births. Infants with a moderate to large ventricular septal defect will present with dyspnea, feeding problems and failure to thrive.

AGA medical corporation have developed an "Amplatzer" device to close such defects as an alternative to open heart surgery.

We will look at a case study of a six year old girl who was referred at four months of age with a murmur and was asymptomatic at that time.

This type of device is a major breakthrough in VSD repair, but further study will be needed to assess long term prognosis of these patients in the future.

EEG and ECG analysis for the detection of seizures in newborn babies

Geraldine Boylan, Barry Greene, Irina Korotchikova, Deirdre Murray, Anthony Ryan

Department of Paediatrics & Child Health, UCC, Cork and Cork University Maternity Hospital

AIMS: Despite the fact that seizures are the most common neurological emergency in the newborn baby and can lead to serious neurological disability, accurate diagnosis remains problematic. The aim of this study was to use a novel approach to seizure detection in the newborn using a combination of EEG and ECG analysis.

METHODS: Continuous 72-hour Video-EEG and ECG recordings were obtained from full-term newborns admitted to the NICU with seizures. The onset and duration of each seizure was identified in each EEG recording and simultaneous ECG changes were also identified. An algorithm was then developed to combine seizure-specific features from the EEG and ECG for the automated detection of seizures in the newborn.

Results: A total of 633 seizures in 10 newborns were identified and analysed. A significant decrease in RR interval during seizures was seen across patients ($p < 0.05$), representing a 3.18% increase in heart rate. The seizure detection performance for the combination of EEG and ECG was found to be superior to the performance of either the EEG or ECG algorithms taken alone. On a patient-specific basis, 617 of 633 (97.52%) seizures were correctly detected, with a false detection rate of 13.18%. On a patient independent basis 516 of 633 (81.44%) seizures were correctly detected with a false detection rate of 28.57%.

CONCLUSIONS: The combination of simultaneously recorded EEG and ECG represents a novel approach to seizure detection in the newborn and an improvement over previously reported seizure detection algorithms.

Lab Accreditation – the U.S. experience

Willie Riordan R.EEG/EP T
Mater Misericordiae University Hospital
Dublin

The purpose of Lab Accreditation is to recognise through an objective review process, those labs that demonstrate the ability to produce technically satisfactory and interpretable electroencephalographic recordings that conform to current International Standards and have in place, policies and procedures to facilitate ongoing technical quality. Such an accreditation process has been in place in the United States for several years now and this presentation is a review of the history and reasoning behind development of lab accreditation and will address the question “Why bother?”

While this presentation addresses EEG Lab Accreditation in particular it is hoped that the audience will participate in a discussion on the need and desire for lab accreditation here in Ireland across all clinical measurement disciplines.

Please Tick your choice of best platform presentation, and return to committee before lunch. Prize to value of Euro 150 for winners.

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Best Poster presentation

Name and Number of poster of your choice:
