



Framework for Quality and Safety in the Emergency Department

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Document Editors:

Fiona Lecky, Clinical Professor/ Honorary Professor/ Honorary Consultant in Emergency Medicine
University of Sheffield/University of Manchester/Salford Royal Hospital NHS Foundation Trust. Emergency
Medicine Research in Sheffield (EMRiS), School of Health and Related Research (SchARR), Regents Court,
Regent Street, Sheffield S1 4DA

Professor Suzanne Mason, Professor of Emergency Medicine
Director of Health Services Research, School of Health and Related Research, University of Sheffield

Jonathan Bengler, Professor of Emergency Care
Academic Department of Emergency Care, University Hospitals Bristol NHS Foundation Trust, Bristol, UK

Peter Cameron, President, International Federation for Emergency Medicine
Chair, Emergency Medicine, Hamad Medical Corporation, Qatar. Professor of Emergency Medicine, Monash
University, Melbourne, Australia

Chris Walsh, PhD, College of Emergency Medicine, UK.

On behalf of the IFEM Quality Symposium Working Group (see Appendix 1)

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Museum, London. A proceedings document has been published previously.¹ This document was presented
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INTERNATIONAL FEDERATION FOR EMERGENCY MEDICINE

34 Jeffcott Street
West Melbourne VIC 3003
T +61 3 9320 0444 | F +61 3 9320 0400
E ifem@acem.org.au | www.ifem.cc

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1. History of Emergency Medicine and IFEM

Emergency Medicine (EM) is one of the youngest medical specialties. It has been in existence for the last 50 years; its rise and spread across the globe occurred through an almost simultaneous development in the IFEM founder nations of Australia, Canada, New Zealand, United States, and the United Kingdom. This occurred when EM pioneers came together in Colleges and Associations which have defined core skills and competencies for the practice of EM, curricula for trainees and forms of assessment for professional qualifications. This has in turn allowed Consultants or Attending Specialists to be identified. The model of emergency medical care in these countries made the Emergency Department (ED) - based on a hospital site with supporting inpatient specialties – the hub of the Emergency Care system. Patients attend EDs on an ad-hoc basis, or pre-hospital personnel transport patients to EDs for EM specialists and their trainees to resuscitate, assess and either admit to the hospital or discharge to the community as appropriate.

This “ED hub” model of Emergency Care, involving the specialisation of physicians in EM, is increasingly popular in developed and developing nations, reflected by the increased membership of the International Federation to over 70 countries in 2012. The ED is being increasingly utilised by patients, who often regard it as providing accessible, timely and high-quality health care. The rise in the use of EDs exceeds population growth and changes in population morbidity², and presents particular system challenges of crowding, assessment and treatment delays and a reduction in both the quality and safety of care, if capacity cannot grow to match demand³.

In countries where EM is well-established attention is now being paid to defining and assuring quality in emergency care. Many IFEM members have done extensive work within their own healthcare systems to identify quality in EDs⁴, applying various measures and promoting these measurements as important to the public and funding bodies. In some countries, there has been national implementation of mandatory quality standards, and external review by governmental and other bodies⁵. There are clear synergies in the measures that IFEM member countries have advanced as “Quality Indicators”, and their experiences of seeking recognition for these indicators as worthwhile measures of patient care⁶. At the same time in countries where EM is developing there may be immense pressures on the emergency care system, combined with limited resources to support that system. Under such circumstances measures of quality may yet need to be implemented, but there are important lessons to be learned from better resourced countries and there is potential for universal standards to be developed and applied.

For these reasons we came together in London to start the work of defining an IFEM framework for quality and safety within the ED that would be applicable across the globe. This will support the development of EM internationally, and also assist in ensuring that our patients receive the best possible care within the finite resources available. We agreed that because quality is a multi-faceted concept a single indicator, such as a universal time-based standard, is undesirable and potentially dangerous because it ignores other aspects of quality such as clinical effectiveness and the service experience. The result can be a distortion of ED activity to achieve this single measure at the expense of other aspects of quality. A further challenge is that although EM is defined in terms of the emergency management of illness and injury, the definition of a medical emergency is often perception-driven, and EDs are usually expected to provide safe, high-quality healthcare to all those who seek it, regardless of the actual degree of acuity or urgency.

In the subsequent sections we:

- Summarise what patients should expect from an ED.
- Examine how the ED differs from other healthcare settings.
- Present a theoretical framework for the domains of quality and safety.
- Identify the enablers and barriers to quality care in the ED.
- Suggest areas where the measurement of indicators may prove valuable.

2. What patients should expect from an ED

The IFEM terminology Delphi project defines an ED as: *“The area of a medical facility devoted to provision of an organized system of emergency medical care that is staffed by Emergency Medicine Specialist Physicians and/or Emergency Physicians and has the basic resources to resuscitate, diagnose and treat patients with medical emergencies.”*

The ED is a unique location at which patients are guaranteed access to emergency care 24 hours a day, 7 days a week. It is able to deal with all types of medical emergencies (illness, injury and mental health) in all age groups. For the general public the ED is the “shop window” of the health service; in consequence it should be supported to provide the level of care that the public both expect and deserve. There is an important distinction between an ED and community-based urgent care facility, which will not include all of the above components. Community-based urgent care facilities may have a different mix of staff and patients, may not be accessible at all times and may play a different role in the provision of healthcare to a population.

Within all countries patients in an ED should expect:

- The right personnel: healthcare staff who are appropriately trained and qualified to deliver emergency care, with the early involvement of senior doctors with specific expertise in E M where life-threatening/changing illness (physical or mental) or injury is suspected.
- The right environment: a dedicated ED, which is properly equipped (for example with monitoring equipment and supplies) and where appropriate compliance with hygiene and infection control measures reduce the incidence of hospital acquired infection for the anticipated number of patients and all commonly presenting conditions, as well as less common but predictable emergencies. There should be adequate space to provide the necessary patient care in an environment that is secure and promotes patient privacy and dignity; acutely ill and injured patients should not be routinely cared for in hallways or non-equipped overflow spaces.
- The right decision making: at all levels of ED function, from managerial/administrative levels to the frontline, the importance of critical thinking in decision making should be recognised and emphasised.
- The right processes: to ensure early recognition of those patients requiring immediate attention and prompt time critical interventions, and the timely assessment, investigation and management of those with emergency conditions
- The right results: optimal outcomes from treatment within the ED for all patients presenting with emergency healthcare needs.
- The right approach: patient-centred care with an emphasis on relieving suffering, good communication and the overall experience of patients and those accompanying and/or caring for them.
- The right system: which enables the patient to access timely and appropriate emergency care, and which continues to support them after they have left the ED. There should be strong links to the community including education and prevention, alongside the promotion of public health.
- The right support: from community and hospital-based healthcare teams, and from the commissioners and managers of the ED, who should ensure that the above arrangements are sustainable. There should be established and agreed mechanisms to monitor standards and compliance, with action taken if an ED falls short.

In countries where EM is well-developed patients can also expect the following, in addition to the eight fundamental priorities outlined above:

- Appropriate access to, and utilization of, diagnostic support services (e.g. plain radiography, ultrasound, CT scanning and laboratory services) by EM doctors when needed for the immediate diagnosis of life threatening conditions
- Expertise in critical care in collaboration with colleagues from anaesthesia and intensive care
- Early access to specialist inpatient and outpatient services to assure appropriate on-going evaluation and treatment of patients with emergency care needs
- Appropriate duration of stay in the ED to maximise patient care and comfort, and to optimise clinical outcomes
- Development of additional services alongside core ED activity to enhance the quality and safety of emergency care. Such services may include short-stay/observation facilities, alternative patient pathways, social and mental health services or associated outpatient activity, and will vary according to local practice and circumstances. However an important component of excellent ED care is the constant development of innovative and enhanced services to support the delivery of quality and safety.

ED staff can expect to be treated with respect by colleagues and patients, and to work in a system and facilities that are safe, and not detrimental to their own health. ED staff can also expect to work in an environment that provides the resources and training they need to meet the above expectations, with an emphasis on the development of evidence-based care and innovation.

Whilst this document focuses on the ED, our conference was constantly reminded of the need to employ a systems approach. The most important consideration is that the ED cannot function in isolation, and commonly exists as the hub of an Emergency Care System (ECS) where the patient journey will start in the community, and return there either directly from the ED or after an inpatient stay. EDs cannot function without recognising the need for a systems approach to quality within these other parts of the ECS; similarly a dysfunctional ED will adversely affect the pre-hospital environment and inpatient service. Finally it is important to recognise that the ECS must interface with the planned elements of a healthcare system – particularly the demand for hospital beds and the availability of specialists – but also with a public health perspective. Efforts to improve quality and safety can be perceived to have negative impacts on other areas of care, such as when emergency patients compete for beds with patients scheduled for planned admission. However, a hospital and community which embraces a culture of quality will welcome efforts by the ED to improve quality and support the implementation of changes that will improve care across the system.

3. How the ED differs from other healthcare settings – decision making

A particular feature of the ED is a high density of clinical decision-making. Not only does each clinician have to identify a set of diagnostic and therapeutic priorities for each patient in limited time and with limited information, but there is an added pressure around disposition because the period of observation that can occur on a ward or in primary care may often prove difficult to implement in the ED.

It is therefore important to understand how clinical decisions are made. In recent years, cognitive psychologists have delineated two broad classes of decision making, Type 1 processing (intuitive) and Type 2 (analytical) (Croskerry)⁷. It is now apparent that well-calibrated decision makers are those who can accurately distinguish between these two modes and are able to switch effectively between them – these are often mindful and flexible thinkers who can monitor their own mental processes, detect and correct bias and are capable of judging their levels of expertise and competency in any clinical situation. However to work in this way presents significant challenges in attention and vigilance; consequentially the quality of decision-making may be threatened by fatigue, sleep deprivation and sleep debt, and cognitive overload – all of which are common features of ED practice. Safety in the ED is therefore intricately linked to thinking skills, and the creation of a working environment that allows a high decision-making density to be effectively sustained. Team working, environmental influences and other aspects of human factors are key to patient safety, and supporting clinicians in this area through a programme of human factors training will promote safe clinical care.

4. How the ED differs from other healthcare settings - Crowding

Unlike most other healthcare settings the ED can readily fall victim to crowding because inflow is rarely regulated, and outflow to inpatient beds is often outside of the control of the ED. This is not desirable in an intensive decision-making environment.

Crowding has a direct effect on quality of care, morbidity and mortality. Multiple studies have demonstrated its harmful effects.⁸⁻¹⁵ Recent research in Canada and Australia shows that as ED crowding worsens (as measured by average total ED length-of-stay among similar patients seen at the same time) the proportion of discharged ED patients who subsequently die or who are readmitted via the ED to hospital within a week increases significantly.¹⁶

Crowding presents a substantial threat to quality within an ED, and is a symptom of system failure in terms of supply and demand resource management in one or more of the key system components listed above. Therefore crowding tends to occur when the ED is required to compensate for failings in other areas of the system¹⁶.

Crowding also appears to undermine the ability of clinicians, and indeed the whole ED, to toggle between Type 1 and Type 2 decision making processes. This in turn undermines the main currency – decision making – of the ED by increasing cognitive load through an increase in the number of patients, interruptions and distractions. Research has shown that when crowding occurs the rate of processing of ED patients does not change, but inevitably the time spent on information-gathering and decision-making per patient must diminish because of these other distractions. The end result is poorer decision making which directly undermines quality and safety.

It is clear that any ED initiative that seeks to improve quality must address crowding, its various systemic causes and consequences. These may include insufficient inpatient beds or poor flow through the health system, insufficient staff numbers, inefficient processes within the ED, inefficient infrastructure, or inadequate support for the ED from the other components of a healthcare system.

5. A theoretical framework for the domains of quality and safety

During the conference we identified the Institute of Medicine framework as an excellent starting point, in that it encompasses our aspiration of “right patient to the right clinician at the right time in the right setting”. The domains of quality from this framework are described in the table below:

Domain	Description
Safe	Avoiding harm to patients
Effective	Providing services based on scientific knowledge to all who could benefit, and refraining from providing services/care to those not likely to benefit
Patient-centred	Providing care that is respectful of and responsive to individual patient preferences, needs, and values
Timely	Reducing waits and sometimes harmful delays
Efficient	Avoiding waste (personnel, resources, finance)
Equitable	Providing care that does not vary in quality because of personal characteristics

Table One: The six quality domains described by the Institute of Medicine⁶

However prior to specifying quality indicators for each of these domains it is important to first identify the components in each ED that allow quality care to occur, and the potential barriers to these.

6. Enablers and barriers to quality care in the ED

- A) Staff:** trained, qualified and motivated to deliver efficient, effective and timely patient-centred care, compliant with local or national guidelines for ED staffing numbers skill/grade mix, including allied health professionals and support staff.

Barriers: staff burn-out, low morale, poor remuneration, inadequate career development opportunities, high turnover, adverse incidents, lack of co-ordinated teamwork, culture of apathy and weak leadership.

- B) Physical structures:** appropriate size and numbers of rooms for resuscitation, major and minor cases, waiting area, reception, triage and diagnostics, staff and patient washrooms, clean areas with appropriate lighting, heating and privacy, adequate ventilation, clean running water and adequate staff facilities. Equipment maintained regularly. Consumables stocked and available.

Barriers: lack of dedicated (or shared) space, overspill into hallways and corridors, poor equipment /stocking, lack of privacy and dignity, dirty/contaminated facilities.

- C) ED Processes:** processes to support effective high-quality care such as specific triage instruments and standard protocols for the ED phase of management including common and high risk presentations such as chest pain, head injury, sepsis, major trauma (with age appropriate modifications) that specify the need for and timing of essential investigations/imaging/therapies and seniority of clinician involved. Design and engineering to support care delivery and reduce human error, consideration of human factors in decision-making and the delivery of emergency care, standardisation of processes and equipment Also includes standard processes for safety and infection control such as hand washing.

Barriers: inadequate consideration of human factors, lack of processes, protocols and guidelines or poor adherence to any guidelines that do exist. Ad-hoc or poorly designed systems. Weak or absent IT structure. Lack of time to develop and implement processes. Lack of local data to support the development of country-specific protocols.

- D) Co-ordinated emergency care throughout the patient pathway:** A systems approach that begins before the ED and runs through the whole patient pathway (healthcare system), with shared ownership and a collaborative approach involving primary care and hospital specialists integration with all components of the care pathway.

Barriers: lack of whole-systems approach and co-ordination *resulting in crowding*. Lack of system support for the ED. Weak integration with community and hospital services, poor or absent design, duplication of processes and equipment.

- E) Monitoring and knowledge of outcomes:** There must be monitoring systems, preferably IT-based, that provide informative data on the impact of the above, plus adverse incident reporting, mortality and morbidity review and complaint monitoring to highlight both individual and system failure. This should be combined with a programme to actively seek out instances of poor quality or compromised safety and ensure continuous improvement in the ED. In many healthcare systems this would fit within an overall structure of clinical governance. Any suite of emergency system indicators must go beyond the ED, to encompass the patient's entire pathway and experience.

Barriers: Lack of monitoring systems and information technology support. Weak or absent systems of governance and review. Failure to engage with other components of the emergency care pathway, lack of management support, with the ED viewed in isolation.

In addition to the barriers mentioned above, all aspects of ED quality and safety will be undermined by:

1. A lack of resources, particularly inadequate finance leading to staff and equipment shortages, deterioration of premises and inadequate systems to ensure effective clinical processes and oversight.
2. Ignorance, apathy or disengagement by managers, commissioners or others with power over the ED, leading to disempowerment and demoralisation of ED staff.

Finally, leadership and a culture of quality are critical to sustaining all of the activities mentioned above. Leaders must be truly invested in, and passionate about, quality. They must be able to imbue this passion in their staff and offer opportunities and resources for staff to be innovative in making improvements. A study by the University Health Consortium⁹ in the US showed that the hospitals with the best quality were led by individuals who were never satisfied with the level of quality at their hospitals and were continuously striving to make improvements. When quality measures are instituted in hospitals other aspects of care can fall by the wayside (i.e. "what gets measured, matters"). A thriving culture of quality is essential to make sure that care that is not being scrutinized does not suffer.

7. Suggested indicators

A series of quality questions and their associated measures are shown in Table 2. The questions posed cover a range of issues that are fundamental to the delivery of high quality care in any ED, but the exact measures used will depend on local factors, the availability of data, and over-arching elements of the healthcare system in any particular setting.

Quality Question	Structure measure	Process Measure	Outcome measure
Facilities adequate?	<ul style="list-style-type: none"> Capacity indices, such as the number of resuscitation/majors cubicles for the patient casemix (in relation to local guidelines) Specific areas for vulnerable groups (e.g. children, mentally ill, confused elderly) Presence or absence of functional equipment to ensure patient safety Adequate security Disaster/major incident plan 	<ul style="list-style-type: none"> Maintenance logs for equipment Regular cleaning records and inspections Regular stock inventory Regular testing/rehearsal of disaster plan 	<ul style="list-style-type: none"> Patient experience Incidence of hospital-acquired infection Recorded incidents of assault / injury on staff members
Numbers and skill mix of staff adequate?	<ul style="list-style-type: none"> Total number of staff and skill mix (in relation to local guidelines) Staff turnover and sickness levels Number of new patients per staff member (with reference to staff seniority) in unit time Number of patients waiting to be seen (by triage category) 	<ul style="list-style-type: none"> Times to be seen by decision maker Times from arrival to discharge from ED Proportion leaving without being seen 	<ul style="list-style-type: none"> Complaints and critical incidents
Is there a culture of quality?	<ul style="list-style-type: none"> Is the leadership committed to quality and accountability? Is the leadership "satisfied" or constantly improving? Does the ED have clinical autonomy and an ability to develop its own evidence-based practice? Quality or safety committee is seen as part of the essential administrative structure? Is ED quality seen as a holistic health service issue? 	<ul style="list-style-type: none"> Hospital leadership visible in clinical areas Hospital-wide quality initiatives (e.g. care transitions, hand-washing) ED-led quality initiatives and guidelines Effective dashboard of quality and safety which is locally available and acted upon Quality of ED decision-making monitored and acted upon (e.g. through errors and adverse events) Adequate communication with primary care and other community services 	<ul style="list-style-type: none"> Patient experience Patient empowerment/ability to participate in own care Medication errors
Data support adequate?	<ul style="list-style-type: none"> Is there a system in place to facilitate monitoring of the process and outcome measures described in this table? 	<ul style="list-style-type: none"> System generates reports that support departmental quality management ICT regularly maintained and developed appropriate to evolving emergency care needs 	<ul style="list-style-type: none"> Patient experience Objective measures show continuous quality improvement Contributions to public health in the local community (child protection, police liaison etc.

Key process measures in place?		<ul style="list-style-type: none"> • Time from arrival to cubicle • Time to decision maker • Time to analgesia • Audit against other EDs and national guidelines • Left without being seen rate • Bed turnovers 	<ul style="list-style-type: none"> • Patient experience • Survival/functional status for time sensitive conditions (e.g. stroke, MI, sepsis) • Time intervals in journey • Diagnostic errors • Avoidable patient returns to the ED
Access block present?	<ul style="list-style-type: none"> • Proportion of time that patients are on trolleys in corridor. • Frequency with which meal rounds and drug rounds are required in the ED. 	<ul style="list-style-type: none"> • Time to offload patients from ambulances • Trolley waits above a locally agreed threshold • Time to admission from decision to admit • Median length of stay for all patients • Left without being seen rate 	<ul style="list-style-type: none"> • Case mix survival measures for high mortality conditions • Length of stay, complication rates for hospitalized patients • Proportion returning to ED within 7 days • Incidence of hospital-acquired infection (depending on length of stay in ED)
Evidence based practice resulting in appropriate care and optimal results?	<ul style="list-style-type: none"> • Presence of clinical pathways to support best evidence-based practice • Appreciation of cost effectiveness 	<ul style="list-style-type: none"> • Pathway compliance • Times to critical interventions such as reperfusion or antibiotics • Regular audits of use of key investigations/treatments of high risk/high volume conditions 	<ul style="list-style-type: none"> • Patient mortality (general or specified conditions) • Risk adjusted outcomes (e.g. from registry data) • Other clinical outcome data • Proportion returning to ED within 7 days
Patient experience measured and acted upon?	<ul style="list-style-type: none"> • Use of patient feedback tools • Inclusion of patients on hospital boards. 	<ul style="list-style-type: none"> • Changes implemented on the basis of patient feedback 	<ul style="list-style-type: none"> • Progressive improvements in patient feedback • Equitable access for different races/gender and minority groups
ED Staff experience measured and acted upon?	<ul style="list-style-type: none"> • Feedback at ED staff appraisals • Use of staff feedback tools including other specialities • Training and education programmes for ED staff 	<ul style="list-style-type: none"> • ED staff empowered and supported by management/leadership team • Changes implemented on the basis of staff feedback 	<ul style="list-style-type: none"> • Progressive improvements in staff feedback • Improving trainee and student feedback in training departments

Table Two: Suggested quality indicators for EDs, grouped by the domains of structure, process and outcome to address all IOM domains (6).

8. Research questions

Despite the acknowledged importance of quality and safety in ED care, and the fact that – in some nations - grant-awarding bodies often see these as priorities for study, there is very little robust research evidence in this field. The subject is rarely amenable to randomised trials, and alternative study designs are therefore required. Qualitative studies, particularly those which directly involve patients, will also prove valuable in addressing some areas. There is an urgent need to agree upon widely applicable outcome measures that can be used to assess the impact of specific interventions and other changes in the configuration and delivery of ED services, and to develop measures of comparability between departments and between health systems. This will help to reduce variation, and also determine cost-effective care, by directly relating cost to meaningful clinical outcomes, particularly those that occur after the patient has left the ED, and which therefore reflect the whole episode of care.

As a result it is hard to say with certainty that even fundamental changes, such as improved facilities or an increase in the number of senior staff, will positively influence patient outcomes.

Large-scale trials, which evaluate impacts across the whole healthcare system, and which also consider prevention and public health, would be ideal but are financially and logistically challenging. In some situations the analysis of routinely collected or population-based data may be informative and cost effective, as might modelling or simulation testing. In all cases the aim should be to institute policy and system-based change on the basis of high-quality evidence, rather than opinion or anecdote.

It is also necessary to develop research projects that cross national and international boundaries, so that different systems in different countries can be compared objectively to allow the development and promotion of best practice across the specialty globally.

A further research question that should be addressed relates to the implementation of a quality and safety framework. In some of the founder nations measures such as the 4 hour target have been implemented within what could be perceived as a punitive culture – with penalties for failure. This has been shown to adversely affect patient safety in some settings. Conversely a less tightly regulated or poorly enforced approach is probably not going to change much within an ED or allow learning that benefits clinical outcomes, staff or patient experiences across the international federation.

9. Conclusions

All EDs have an obligation to deliver care that is demonstrably safe and of the highest possible quality. EM is a unique and rapidly developing specialty which forms the hub of the emergency care system and strives to provide a consistent and effective service 24 hours a day, 7 days a week.

The International Federation of Emergency Medicine, with more than 70 member countries, has prepared this document to define a framework for quality and safety in the ED. It sets out reasonable expectations for patients attending any ED globally, and also the additional expectations for EDs functioning in a well-developed healthcare system. Particular attention is drawn to the cognitive and decision-making demands that underpin safe and effective ED practice, and the problems of crowding.

The enablers and barriers to quality care in the ED can be considered under the headings of: staff; physical structures; ED processes; co-ordinated care and monitoring of outcomes. Following a consensus conference and with subsequent development a series of quality indicators have been proposed. These are tabulated in the form of measures designed to answer nine quality questions, presented according to the domains of structure, process and outcome. There is an urgent need to improve the evidence base to determine which quality indicators have the potential to successfully improve clinical outcomes, staff and patient experience in a cost efficient manner – with lessons for implementation.

The International Federation hopes that this framework will provide a common consensus to underpin the pursuit of quality and safety in all EDs, thereby improving the outcome and experience of emergency patients and our staff worldwide. In order to achieve these goals, emergency care must be an absolute priority for healthcare planners at local, regional and national level.

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Appendix I

List of Presenters and contributors

Professor Jonathan Bengier

Dr Gautam Bodiwala

Mr Simon Burns

Dr Mike Clancy

Professor Peter Cameron

Dr Carmel Crock

Professor Pat Croskerry

Dr James Ducharme

Dr Gregory Henry

Dr John Heyworth

Dr Brian Holroyd

Dr Ian Higginson

Dr Peter Jones

Dr Arthur Kellerman

Professor Fiona Lecky

Dr Geraldine McMahon

Professor Suzanne Mason

Professor Elisabeth Molyneux

Professor Patrick Nee

Dr Ian Sammy

Dr Sandra Schneider

Dr Michael Schull

Dr Suzanne Shale

Professor Ian Stiell

Professor Ellen Weber