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This document is the latest version of the Hospital Medicine Module prepared by the HSP Hospital Medicine Module Development Working Group, led by Dr Mary G T Webber.

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Preamble

The Hospital Skills Program (HSP) provides a life-long pathway for self-directed medical education across three levels of agreed expertise, using a variety of traditional and non-traditional resources and methods appropriate to the working environment of the participant, resulting in the acquisition of a skills portfolio useful to an employer, and appropriate to the local patient community.

The HSP recognises the heterogeneous nature of the skills and circumstances of Career-Medical-Officer-equivalent medical practitioners, their continuing value in the delivery of health services to the population of NSW, and their right to meaningful educational opportunities in a mode appropriate to their working lives and geographic locations.

HSP recognises that self-directed education is the realm and property of the adult learner, and that accountability for learning remains with the individual. Therefore HSP exists firstly to identify, coordinate and facilitate the delivery of learning opportunities, and to assist the individual to evaluate their progress across the three levels of HSP and to plan for their own future needs.

Furthermore, the HSP provides a mechanism to align clinical learning activities with the goals of the health system and to deliver priority education to hospital generalist doctors when this need is identified by expert groups such as NSW Health and the NSW Clinical Excellence Commission.

Dr Mary G T Webber
Hospitalist
Ryde Hospital, NSW
Section 1: Background

The HSP Hospital Medicine module identifies the anticipated capabilities of doctors working in a hospital generalist role in NSW hospitals. Doctors participating in the HSP will have at least two years of clinical postgraduate experience and not be currently participating in a specialist vocational training program.

This module has been developed by HETI on behalf of NSW Health as part of the Hospital Skills Program for generalist doctors. It aims to guide doctors, their employers and educators with regard to learning and professional development needs, workplace responsibilities and clinical tasks.

This module is one of several that have been developed by HETI for the HSP. The other modules describe capabilities required for clinical work within a variety of medical contexts (including Mental Health, Aged Care, Paediatrics, Women’s Health, Drug and Alcohol Medicine, Rural Health and Aboriginal Health).

The HSP modules were developed with particular reference to the Australian Curriculum Framework for Junior Doctors (ACFJD), prepared by the Confederation of Postgraduate Medical Education Councils. The HSP modules have a similar structure to the ACFJD, comprising the categories of clinical management, communication and professionalism. The modules also identify common illness problems and conditions for which HSP participants are likely to respond, and describe the procedures and clinical skills that are expected of HSP participants.

The presentation of the Hospital Medicine module is intended to recognise and reinforce a mode of practice within hospital medicine that focuses on the continuity and quality of clinical care, patient safety and patient flow.

Further curriculum work is underway to review module learning outcomes in terms of “entrustable professional activities” (Ten Cate 2006). These are broader capabilities that can be used to provide direction for professional development and to assess doctors as having the capacity to carry out particular clinical responsibilities, either under supervision, or independently (eg, leading a Clinical Emergency Response System team in hospital wards or managing a normal delivery in the Emergency Department).

Overview of the Hospital Medicine module

The HSP Hospital Medicine module identifies the capabilities of doctors working in the developing field of Hospital Medicine, with a particular focus on learning how to respond to clinical and system demands. These occur across many specialist teams without necessarily being the core business of that team or specialty.

Hospital medicine has recently emerged as a parallel rather than competitive stream of care, which supports inpatient specialist teams to focus safely on delivering their core skills, while reducing the transaction costs and variations of care delivery across the hospital, and working to increase its safety and efficiency for patients.

It is anticipated that while the themes and concerns of this stream of medical practice will be widely applicable, their particular application will be site-specific and responsive to local conditions.
Rationale for a module in Hospital Medicine

The forces of population growth and ageing, social dislocation, ethnic diversification and altered systems of care that emphasise very short admissions and community-based models of service have combined over the last 30 years to alter the demographics of the inpatient population in irrevocable ways.

Patient characteristics have changed. It is widely recognised that today’s patients are older, sicker, have more interrelated co-morbidities, are more likely to suffer a complicating cognitive decline or mental illness and less likely to have a secure network of informal carers. Such patients require expert multi-disciplinary care delivered in systems responsive to the patient in context.

Less widely recognised are the effects of the way medicine is practised on this changing inpatient scenario. Doctors in hospitals are traditionally trained into specialities based upon discipline groupings (eg, cardiology, orthopaedic surgery) or defined hospital contexts (eg, the emergency department or the intensive care unit). Expertise and skills are developed to an extraordinary depth and detail within those fields as determined by specialist colleges, and as those fields advance. Specialisation inevitably narrows focus, and focus is assumed to be a good thing.

Innovation and training tend to increase specialisation, and specialisation is recognised, valued and rewarded, often by release from the confines of public hospital practice. Expert focus on system characteristics is the business of medical administrators who are often, though not always, separated from the realities of 24/7/365 clinical practice by their own process of specialisation.

Several characteristics of our current medical system, coupled with rising demand, predispose to patient risk. There is widespread dependence on specialist Visiting Medical Officers and specialist and super-specialist training and services are condensed into district-based networks. These networks are often dominated by a few tertiary facilities offering advanced care in an environment of significant bed pressures and complex access issues. The rapid turnover of trainee junior medical staff creates challenges in providing adequate and consistent education, orientation and support.

It is difficult to manage clinical risk in an environment in which not even the most dedicated professional can have knowledge of everything that happens to a patient during their stay. Information loss is a pervasive hazard. Time-based performance targets for emergency departments place downward pressure on the ‘setting up and sorting out’ phase of the early admission process and bed pressures mean that patients must be discharged as soon as practicable – and sometimes before.

Outliers (eg, a medical patient in a surgical ward) are common and patients often suffer from several moves between specialised areas, such as from emergency department to emergency medical unit, and then to clinical decision units, between wards and beds, to off-site treatment units, between specialist teams, through transit lounges and surge beds, and to and from high acuity areas and rehabilitation units. Prevailing conditions and rising demand predispose to conditions of risk for the inpatient population.

The following data provide a context for the development of an HSP module in Hospital Medicine.

There were 1326 hospitals in Australia in the financial year 2009/10. The 753 public hospitals accounted for 67% of hospital beds (56,900) and the 573 private hospitals accounted for 33% (28,000), proportions remaining unchanged from 2008/09. There were 8.5 million separations for admitted patients in 2009/10, with 5.1 million occurring in public hospitals and almost 3.5 million in private hospitals.
This was an increase of 3.2\% on average each year between 2005/06 and 2009/10 for public hospitals, and 5\% for private hospitals. The proportion of admissions that were ‘same-day’ continued to increase, by 5\% on average each year between 2005/06 and 2009/10, accounting for 58\% of the total in 2009/10 (51\% in public hospitals and 68\% in private hospitals). For overnight separations, the average length of stay was 5.9 days in 2009/10, down from 6.2 days in 2005/06 (Australian Institute of Health and Welfare 2011).

The World Health Organization’s High 5’s program for patient safety articulates the top five challenges for patient safety that are generated by hospital admission (WHO, 2010):

1. concentrated injectable medicines
2. medication accuracy at transitions in care
3. correct procedure at the correct body site
4. communication failures during patient handovers
5. addressing health care associated infections.

These are complex problems and the need for a whole-of-hospital medical, multidisciplinary, and system engagement in patient safety is apparent.

Other risks of hospitalisation have been studied, especially through the deteriorating patient literature (eg, CEC, 2008), and a group of diagnoses can therefore be identified that are appropriate for the generalist hospital medicine practitioner to master. Innovative system design presents opportunities to influence the conditions that predispose to medical error and patient deterioration, avoiding situations like that described in Appendix 3.

Hospital generalists need to develop expertise in recognising, tolerating and managing risk. They also need to be familiar with the supporting legal framework of hospital practice, to act as reservoirs of information, support junior staff, and practise empirical decision making and reflective practice. This requires self and system knowledge skills, such as recognising the point of need for speciality consultation. Properly managing this specialist interface requires a profound knowledge of local conditions and is a poorly recognised yet vital skill set for the coordination of patient access to care.

Hospital medicine responds to the characteristics of the inpatient population and provides a bridging function across discipline silos, seniorities, specialities and disciplines. The proper concerns of hospital medicine are the challenges, both clinical and systemic, that occur across many different teams, and which are not the core business of the team. Practitioners show maturity in understanding and promoting the management of the patient within their social and clinical context regardless of the location in the hospital in which they are employed. Such knowledge is built and held in a permanent continuous workforce.

Formative assessment and entrustable professional activities

The HSP provides a framework for workplace-based, competency-based formative assessment and the recognition of current competencies. The HSP framework for formative assessment is underpinned by core principles of authentic workplace based assessment. Assessment in the HSP is valid, reliable, feasible and fair.

A valid assessment task is one that accurately assesses the capability or competency as outlined in the HSP module. For example, a valid assessment of an emergency department tracheal intubation procedure would be the direct observation of a doctor performing this skill, but not a multiple choice test of how much a doctor knows about the anatomy and physiology of respiratory structure and function.

An assessment is reliable if it yields consistent and precise results and is free from bias or error.
A **feasible** assessment is one that is cost effective, allows sufficient time for the assessment tasks to be carried out by the doctor and can be administered using available relevant workplace equipment and other resources.

A **fair** assessment is one that allows for the recognition of current capabilities and achievement no matter how, where or when learning has occurred. A fair assessment also is one that does not disadvantage any particular individual on the basis of age, gender and other personal attributes.

Entrustable professional activities (EPAs) are sets of professional tasks that doctors perform in their clinical roles. These medical tasks are entrusted to doctors by health system employers and supervisors. Professor Olle ten Cate (2006) who first described EPAs, notes that this concept emphasises the notion of trust, formalising what medical managers and supervisors practise when they identify doctors who they trust to complete particular professional tasks on the ward or in other hospital contexts.

The EPAs described in this module have been identified by the Hospital Medicine Module Development Group through an analysis of clinical activities that are of central importance to the practice of hospital medicine.

Because the sum of what doctors do in hospital medicine practice is greater than the parts described by individual competencies, EPAs provide an approach that minimises the atomisation of professional competencies, which is an undesirable side-effect of some competency-based assessments (Van der Vleuten and Schuwirth, 2005).

Ten Cate (2006: 750) identifies the following criteria for EPAs:

- part of essential professional work
- require specific knowledge, skill and attitude
- generally acquired through training
- lead to recognised output of professional labour
- usually confined to qualified staff
- independently executable within a time frame
- observable and measurable in their process and their outcome
- lead to a conclusion (done well or not done well)
- reflect the competencies to be acquired.

Using the concept of EPAs and building formal entrustment decisions into the HSP has many advantages for the field of hospital medicine, including:

- providing guidance for professional development and progression
- supporting supervision and guiding workplace based assessment
- integrating professional competencies into broader capabilities reflecting real-world practice in hospital medicine
- fostering a developmental continuum of workplace-based learning, formative assessment and workplace progression.

Through involvement in the module’s educational experiences, including access to relevant resources, HSP participants will be able to engage in the entrustable professional activities relevant to their practice at the HSP level designated. This will support a career-long process of increasing depth of expertise and synthesis of clinical skills for doctors working in hospital medicine.
Levels of competence

Ten Cate and Scheele (2007: 543) argue that these EPAs “are the constituting elements of professional work” and applying this concept to postgraduate medical education involves considering multiple levels of professional activity.

An HSP level has been allocated for each EPA in the Hospital Medicine module. The three levels of the HSP reflect the developing knowledge and skills required of increasingly complex clinical management scenarios and increasing work role responsibility, entrustment and accountability. Each of the three levels broadly distinguishes doctors in terms of proficiency, experience and responsibility. The following is a summary of the criteria on which the HSP levels have been determined.

It is assumed that doctors will practise medicine with the degree of autonomy that is consistent with their level of experience (E), clinical proficiency (CP) and responsibility (R) to ensure patients receive care which is appropriate, effective and safe. The levels are cross referenced with levels described for the patient competencies in the National Patient Safety Education Framework (see Appendix 1).
Table 1: Defining levels of entrustable professional activity in the Hospital Skills Program

<table>
<thead>
<tr>
<th>Key</th>
<th>HSP 1</th>
<th>HSP 2</th>
<th>HSP 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level of experience (E)</td>
<td>Has limited workplace experience in this discipline.</td>
<td>Has moderate to large workplace experience in this discipline.</td>
<td>Has substantial workplace experience in this discipline.</td>
</tr>
<tr>
<td>Clinical proficiency (CP)</td>
<td>Reliably recognises familiar situations and key issues. Has a good working knowledge of the management of these. Decision-making is largely rule bound. Demonstrates effective clinical decision making and clinical proficiency in defined situations.</td>
<td>Recognises atypical presentations, recognises case specific nuances and their relational significance, thus reliably identifies key issues and risks. Decision making is increasingly intuitive. Fluent in most procedures and clinical management tasks.</td>
<td>Has an intuitive grasp of a situation as a means of linking his or her understanding of a situation to appropriate action. Able to provide an extensive repertoire of management options. Has a comprehensive understanding of the hospital service, referral networks and links to community services.</td>
</tr>
<tr>
<td>Responsibility (R)</td>
<td>Uses/applies integrated management approach for all cases; consults prior to disposition or definitive management; and arranges senior review of the patient in numerous instances, especially serious, complex, unclear or uncommon cases. Observes family conference discussions about care and discharge planning if requested by senior clinician (and permitted by the family or carer/s)</td>
<td>Autonomously manages simple and common presentations and consults prior to disposition or definitive management for more complex cases. Conducts family conference discussions about care and discharge planning under supervision of senior clinician.</td>
<td>Works autonomously, consults as required for expert advice and refers to admitting team about patient who require admission. and other medical specialists as required. Independently conducts family conference discussions about care and discharge planning under supervision of senior clinician.</td>
</tr>
<tr>
<td>Patient safety (PS)</td>
<td>Level 2</td>
<td>Level 2 - 3</td>
<td>Level 3</td>
</tr>
</tbody>
</table>
Summary of the Hospital Medicine module

The rationale of hospital medicine is to understand the patient in context, and to use excellent clinical skills, a broad system view and expert local knowledge in making decisions.

The Hospital Medicine module aims to support the development of a doctor with a top-to-bottom, side-to-side perspective. It emphasises the following themes: continuity, quality, safety, flow and advocacy for hospital services and persons.

Continuity of hospital medicine care extends across hospital organisation and health discipline boundaries. Continuity of care also implies a relationship between clinician and patient that exists from admission to discharge and extends to supporting the patient through building relationships with general practitioners and other health professionals following discharge.

Haggerty et al (2003) in their review article on continuity of care argue that three types of continuity exist:

**Informational continuity:** The use of information on past events and personal circumstances to make current care appropriate for each individual.

**Management continuity:** A consistent and coherent approach to the management of a health condition that is responsive to a patient’s changing needs.

**Relational continuity:** An ongoing therapeutic relationship between a patient and one or more providers.

This module supports enhanced quality of care by hospital practitioners. Good hospital medicine practice leads to improved quality of care as measured by indicators such as length of stay and treatment costs.

Patient safety is focused on minimising risk of patient harm due to the experiences during their hospital stay. Approximately 10% of patients in hospitals experience actual harm as an unintended consequence of care, such as a hospital acquired infection or medication error (Australian Patient Safety Foundation, 2010).

This module recognises the goal to expedite patient flow in a manner that ensures patients receive safe and timely care. This goal is not only to be achieved within the hospital, but it is expected that the hospital medicine practitioner will engage with the local health professional community to ensure appropriate patient care.

Hospital medicine practitioners routinely act as advocates for the effectiveness and efficiency of hospital services and the people providing hospital services.

Hospital generalists who participate in the Hospital Medicine module are expected to demonstrate the following personal characteristics: seniority in the health system, commitment to the health service, excellent situational awareness and confidence in their own skills, with the broad clinical experience to get things done for the patient.

The following topics covered in the Hospital Medicine module align closely with the Clinical Excellence Commission’s priority areas for clinical improvement (www.cec.health.nsw.gov.au):

**Handover processes:**
- Development and embedding at local level
- Using current resources
- Rolling audit and feedback
- Leadership and promulgation
- Team to team, term to term, day to night, week to weekend and return, across holidays, between clinical units, hand-back, building and supporting the hospital team.

**Leading in system-wide responses to the deteriorating patient at ward level**
- Participating in resuscitation teams
- Follow through and carriage of recurring issues
• Training in technical and non-technical topics
• Feedback loops to achieve prevention
• Mentorship and participation in multi-disciplinary teams
• Advocacy and trialling for equipment and training
• Performing audit
• Providing feedback and development
• Troubleshooting.

Transitions of care
• Admission negotiation skills
• Medical participation and leadership in multi-disciplinary teams
• Care and discharge planning meetings
• Standards in medical record keeping
• Promoting general practitioner liaison
• Discharge processes and their review
• Transfers between and inside institutions and levels of care
• Knowledge of local networks
• Retrieval services
• Escalation of failing systems and patient and community advocacy.

Medical education and support to junior staff
• Junior doctor and collegial support
• Cross-disciplinary professional development
• Medicolegal frameworks for practice
• Accessing and interpreting policies
• Recognition and assistance to the clinician in difficulty
• Conditions and requirements for supporting international medical graduates.

Organisational liaison and support

Medical error and clinical governance
• Open disclosure
• Ethical aspects of hospital practice
• Incident management and reporting
• Complaints management
• Clinical incident review
• Morbidity and mortality meetings
• Local quality systems
• The Coroner’s Court – purpose of notification.

End of life processes
• Mentorship and participation in multidisciplinary teams
• Development of local networks within the hospitals and into the community
• Practical assistance and support to junior staff
• Ethical issues and medicolegal requirements
• Processes of death certification and organ donation.

Occupational health and safety

Public health
• Epidemiology of local environment
• Notification requirement of infections
• Multiresistant organism isolations and drug reactions
• Health literacy - for example, health literacy is defined in Health People 2010 as: “The degree to which individuals have the capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions … includes the ability to understand instructions on prescription drug bottles, appointment slips, medical education brochures, doctors directions and consent forms, and the ability to negotiate complex health care systems.”

Conditions that occur across the hospital and across multiple specialist teams (but which may not be the core business of that team) and managing conditions of clinical risk are considered to be the proper concerns of the Hospital Medicine module.
Section 2: Concurrent inpatient assessment, stabilisation and management

Rationale

It is characteristic of providing hospital wide care to be called to assess a patient not on one’s ‘home’ team, or who has undergone a change of clinical status, or altered symptoms. This intervention has traditionally been provided by the most junior medical staff, working in overstretched roles, and confronted by patients whose complexity can be overwhelming (CEC, 2008). The hospital medicine role requires considerable experience and maturity, a tolerance of uncertainty and the capacity to act safely with incomplete information, and to understand and to balance risks.

Knowledge of local systems and capabilities across the 24/7/365 environment is required to provide efficient care and makes this a proper field of activity for Hospital Medicine. Furthermore, this skill involves understanding the patient in context — to make sense of disparate sources and levels of information — skills that are enhanced in the practitioner with seniority, with judgement, with corporate knowledge, and who functions in continuity roles across a single site.

Consideration of the inpatient environment reveals different skill and knowledge sets relevant to different groups of patients. While a deal of attention has been paid to the problems of acute patients, it is timely to separately consider and articulate the needs of chronic patients and periprocedural patients. Doing so results in a more satisfying and richer knowledge set, more reflective of the working realities of hospital medical staff and a better basis for planning education and training. Overlap between groups is inevitable. The specific requirements of the other main groups — pregnant women, children and adolescents, are beyond the scope of this module.
<table>
<thead>
<tr>
<th>Table 2.1: Entrustable professional activities for concurrent inpatient assessment, stabilisation and management</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute patients</strong></td>
</tr>
<tr>
<td><strong>EPA HM2.1:</strong> Recognise and correctly act on observations (HSP2)</td>
</tr>
<tr>
<td><strong>EPA HM2.2:</strong> Order and interpret investigations (HSP2)</td>
</tr>
<tr>
<td><strong>EPA HM2.3:</strong> Institute stabilisation and prevent progression (HSP2)</td>
</tr>
<tr>
<td><strong>EPA HM2.4:</strong> Manage disposition (HSP2)</td>
</tr>
</tbody>
</table>
Section 3: Common problems and conditions

Rationale

The population at highest risk for acute hospital admissions and with the highest complex and chronic care needs are those aged 85 years and above. This age group has increased in numbers and as a proportion of the population over the period 2001–2011 and will continue to increase (GMCT, 2002), as Table 3.1 indicates.

In clinical practice, hospitalised patient populations show 'herd characteristics' determined by local demographics, patterns of referral, and the role delineation of the hospital. Patients admitted with disabling co-morbidities that are not ‘on the list’ of services provided under clinical services planning can face a difficult time obtaining access to care. Hospital doctors responsible for inpatients need to be cognisant of and adept in managing complex overlapping health needs. Articulating these conditions and requirements for the differing but related groups (include acute patients, chronic patients and periprocedural patients) assists the doctor to work in a complex decision-making environment. These are problems or conditions that occur across many different teams without necessarily being the core business of the team, making this an appropriate field for hospital medicine activity.

Table 3.1: Population at highest risk for acute hospital admissions (from GMCT, 2002)
<table>
<thead>
<tr>
<th>Table 3.2: Entrustable professional activities for common problems and conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acute patients</strong></td>
</tr>
<tr>
<td>EPA HM3.1 Provide medication for blood pressure (HSP 2)</td>
</tr>
<tr>
<td>EPA HM3.2 Manage cardiac problems (HSP 2)</td>
</tr>
<tr>
<td>EPA HM3.3 Provide end of life care (HSP 2)</td>
</tr>
<tr>
<td>EPA HM3.4 Manage infectious conditions (HSP 2)</td>
</tr>
<tr>
<td>EPA HM3.5 Provide pain management (HSP 2)</td>
</tr>
<tr>
<td>EPA HM3.7 Provide drug and alcohol care (HSP 2)</td>
</tr>
<tr>
<td>EPA HM3.8 Provide mental health / psychosocial care (HSP 2)</td>
</tr>
<tr>
<td>Table 3.2 continued: Entrustable professional activities for common problems and conditions</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>Acute patients</strong></td>
</tr>
<tr>
<td><strong>EPA HM3.9</strong> Recognise and manage delirium, dementia and depression (HSP 2)</td>
</tr>
<tr>
<td><strong>EPA HM3.10</strong> Provide early recognition and prompt treatment for sepsis (HSP 2)</td>
</tr>
<tr>
<td><strong>EPA HM3.11</strong> Manage nutrition needs (HSP 2)</td>
</tr>
<tr>
<td><strong>EPA HM3.12</strong> Maintain glycaemic control (HSP 2)</td>
</tr>
<tr>
<td><strong>EPA HM3.13</strong> Manage dermatological problems (HSP 2)</td>
</tr>
<tr>
<td><strong>EPA HM3.14</strong> Respond appropriately to obesity (HSP 2)</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Section 4: Procedural entrustable professional activities

Rationale

Unintended consequences have arisen from shortening admission length, less invasive approaches to surgery and subspecialisation. Interventions once commonly performed by the intern, such as inserting and maintaining a suprapubic catheter or changing a PEG tube, and even performing a lumbar puncture occur less frequently in general wards. Much initial patient stabilisation is being performed in the emergency department. In larger institutions the use of support staff such as surgical dressers is not uncommon. An increased number of interns rotating through and a newly recognised need for accreditation of procedural skills and consent requirements have resulted in challenges to acquiring and maintaining procedural skills and a gradual procedural deskilling of hospital medical staff outside specialist units.

The recognition of the realities of practice in a resource-poor environment can provide an impetus to develop and decentralise teaching materials to satisfy the minimum skill set required for a given location. Advances in communication technology offers significant opportunities in this area.

It is anticipated that consistent, skilled hospital medicine practitioners may function as the locus, not only of skill delivery, but of the provision of accreditation and teaching opportunities for junior staff. Knowledge of the indications for a procedure within a specific patient and resource context, and the ability to reach a reasoned decision and plan for intervention, distinguishes the advanced practitioner.

The increasingly aged and complex nature of the inpatient population, and the emerging need to integrate the efforts of many specialist and subspecialist, nursing and allied health systems, and then to function within a restricted resource base, dictates that a particularly broad set of knowledge skills is required for the hospital medicine practitioner. This is a poorly articulated skill set worthy of additional study when implementing the Hospital Medicine module.

EPA HM4.1 Airway skills (HSP 3)
Open the airway. Insert Guedel’s and nasopharyngeal airway. Perform bag valve mask ventilation. Insert laryngeal mask. Set up and monitor continuous positive airway pressure and bi-level positive airway pressure. Carry out decision making in support of, setting up for, and performing simple endotracheal tube airway management. Implement techniques to escalate care for difficult endotracheal tube patient (eg, can’t ventilate, can’t oxygenate). Perform surgical airway. Detect and respond appropriately to changing conditions.

EPA HM4.2 Vascular access (HSP 2)
Provide normal and difficult venous access. Obtain arterial blood gases. Place central venous lines — ‘blind’ and under ultrasound. Attach monitoring and perform and confirm correct placement protocol for central vascular catheterisation. Implement best practice recommendations to avoid central catheter infection. Evaluate the need for and place an intra-osseous needle. Perform emergency venous cut down and place arterial lines — by touch and under ultrasound — and attach monitoring. Evaluate the need for and place peripherally inserted central catheter lines.

EPA HM4.3 Cardiovascular (HSP 3)
Manage intravenous fluids. Evaluate the need for cardioversion, and if required, prepare for the conduct and performing of cardioversion. Initiate and monitor external pacemaking. Identify electrical and mechanical capture. Place temporary pacemaker in emergencies and interpret basic cardiac echo.
EPA HM4.4 Respiratory (HSP 2)
Conduct emergency identification and drainage of tension pneumothorax. Insert intercostal catheter placement and maintain, monitor and remove underwater seal drainage. Conduct pleural drainage.

EPA HM4.5 Central Nervous System (HSP 2)
Perform lumbar puncture under asepsis. Obtain and interpret cerebral spinal fluid pressures. Perform sip test to evaluate basic swallowing.

EPA HM4.6 Gastrointestinal (HSP 2)
Initiate focused assessment with sonography for trauma scan. Provide peritoneal tap and drainage. Place nasogastic tube and provide confirmation of correct placement protocol. Provide for the care and removal of drains. Provide indications for the organisation and replacement of percutaneous endoscopic gastrostomy tubes.

EPA HM4.7 Urinary (HSP 2)
Perform a bladder scan. Insert a simple male and female indwelling catheter, maintain aseptic technique, implement difficult catheter techniques, insert and replace suprapubic catheters as required.

EPA HM4.8 Management of Pain (HSP 2)
Provide regional anaesthetic for pain control. Manage patient-controlled analgesia including writing up, setting up, and ceasing as appropriate. Adjust traction as required. Provide simple postoperative pain skills (eg, using Pain Buster). Provide opiate substitution as required.
Section 5: Responses to emergencies

Rationale

Knowledge and expertise in the common causes and presentations of deterioration is an appropriate skill and knowledge set for the hospital medicine practitioner to learn, maintain, and develop.

Knowledge of uncommon but serious conditions should also be developed and maintained. In this section a number of condition-specific knowledge and procedural skills are synthesised, building into an ‘emergency responses set’ appropriate to managing the undifferentiated patient whose condition deteriorates in hospital.

The most common presentations are respiratory distress, hypotension and neurological derangement.

The most common diagnoses for Medical Emergency Team/CERS scenarios are sepsis, pneumonia, atrial fibrillation and seizures (Calzavacca, Licari, Tee et al 2008).

Delay to activation of the MET/CERS team is known to be associated with worse outcomes (Quach, Downey, Haase et al 2008).

The hospital practitioner is cognisant of the many local determinants of willingness to activate the MET/CERS team, and actively supports the whole team to make the call.
### Table 5.1: Entrustable professional activities for responses to emergencies

<table>
<thead>
<tr>
<th>Component competencies</th>
<th>EPA for related but uncommon conditions (contextual)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPA HM5.1</strong>&lt;br&gt;Implement BLS/ALS/DETECT/APLS or equivalent <em>(HSP 2)</em></td>
<td>Hold current certification or teaching experience within last 2 years, appropriate to clinical context – eg, with paediatrics or without, familiar with major topics in resuscitation, able to lead a medical response and provide a minimum of basic airways support.</td>
</tr>
<tr>
<td><strong>EPA HM5.2</strong>&lt;br&gt;Manage airways obstruction <em>(HSP 3)</em></td>
<td>Identify mucous plugging, identify presentations of foreign body, identify need for and perform suction, positioning, for difficult intubation to mid-level skills according to anaesthetic guidelines.</td>
</tr>
<tr>
<td><strong>EPA HM5.3</strong>&lt;br&gt;Manage respiratory failure <em>(HSP 2)</em></td>
<td>Identify type 1 and type 2 respiratory failure and respond appropriately to exacerbation of chronic obstructive pulmonary disease. Identify signs of deterioration in patient with severe asthma, escalate bronchodilators and set up salbutamol infusion appropriately, identify clinical criteria for transfer to High Dependency Unit. Use pneumonia severity score. Identify criteria for use of, set up and adjust CPAP and BIPAP. Identify pneumothorax, decompress and place intercostal drain. Utilise appropriate clinical and laboratory investigations in ruling in/out a pulmonary embolism.</td>
</tr>
<tr>
<td><strong>EPA HM5.4</strong>&lt;br&gt;Manage cardiovascular conditions <em>(HSP 3)</em></td>
<td>Recognise atrial fibrillation with rapid ventricular response, assess precipitating causes, use appropriate drug therapies and follow-up. Recognise and appropriately respond to the emergence of acute pulmonary oedema, using vascular dilators, fluid off load if required, CPAP if necessary. Recognise and can treat bradycardia in clinical context. Recognise indications and local processes for placement of temporary pacing, can recognise clinically significant hypotension in a variety of clinical contexts, including occult gastrointestinal bleeding and drug reaction, can place arterial lines and PICC and central lines and initiate inotropic support, recognises the ECG, laboratory and clinical manifestations of acute myocardial infarction, familiar with and able to initiate local escalation processes for interventional cardiology.</td>
</tr>
</tbody>
</table>
Table 5.1 continued: Entrustable professional activities for responses to emergencies

<table>
<thead>
<tr>
<th>Component competencies</th>
<th>EPA for related but uncommon conditions (contextual)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EPA HM5.5 Manage neurological conditions (HSP 2)</strong></td>
<td>Identify the need for and perform emergency aspiration of a blocked ventriculo - peritoneal shunt.</td>
</tr>
<tr>
<td>Evaluate the significance of a change in Glasgow Coma Scale in a wide variety of clinical scenarios. Recognise seizure and initiate airway support and drug treatment and investigation. Interpret the cerebral CT in age-normal and age-abnormal scans. Perform lumbar puncture. Identify delirium and institute appropriate pharmacologic and non-pharmacologic management. Recognise physiological signs of increasing intracerebral pressure and activate local resources to manage pressure.</td>
<td></td>
</tr>
<tr>
<td><strong>EPA HM5.6 Manage sepsis (HSP 2)</strong></td>
<td>Recognise sepsis from renal calculi, obstructed ureter and respond appropriately. Identify epidural abscess and respond appropriately.</td>
</tr>
<tr>
<td>Recognise physiological changes of systemic inflammatory response syndrome and severe sepsis and implement effective and appropriate management. Demonstrate appropriate use of antibiotics in febrile neutropaenia. Recognise the need for inotropic support and manage transfer to higher level care.</td>
<td></td>
</tr>
<tr>
<td><strong>EPA HM5.7 Manage renal disorders (HSP 2)</strong></td>
<td></td>
</tr>
<tr>
<td>Perform bladder scan, place urinary catheters, modify drug dosages in conditions of renal failure, recognise the physiological and electrocardiogram manifestations of life threatening electrolyte disturbances of sodium, potassium and institute emergency treatment.</td>
<td></td>
</tr>
<tr>
<td><strong>EPA HM5.8 Other – hazardous but less common (HSP 2)</strong></td>
<td>Identify acute marrow failure, Addisonian crisis, thyroid crisis, Wernickes encephalopathy, Beriberi / vitamin deficiency, including vitamin D.</td>
</tr>
<tr>
<td>Recognise diabetic ketoacidosis and hyperosmolar states in the inpatient and institute stabilisation.</td>
<td></td>
</tr>
</tbody>
</table>
Section 6: System design and the characteristics of hospital practice

Rationale

Experienced practitioners in hospital medicine bring additional dimensions to the culture and functioning of their hospitals. Translation of theory into practice, managing a difficult colleague, culture building, promoting cooperation, identifying an opportunity or a threat, responding to changing conditions over time are advanced cognitive and system skills that are under-recognised. Understanding these issues and achieving the hospital skills and knowledge sets listed below will demonstrate the advantages of a whole-of-hospital perspective.

System skills for hospital medicine practitioners:

- Understanding the health system, especially governance and accountability frameworks at local, network, state and federal levels.
- Identifying where knowledge about the local hospital system is stored. Who are the key personnel?
- Recognising the resource characteristics of overlapping clinical frameworks — retrieval, ambulance, disaster, public health, mental health, drug and alcohol, children's health, trauma and burns networks, tissue donation and transplant, community services.
- Implementing successful systems to reduce avoidable readmission or failed discharge.
- Identifying and containing system failure — single events, multiple events, identifying emerging trends, and having a system-wide view.
- Improvising solutions and understanding the characteristics of high reliability organisations, with the purpose of building organisational resilience.
- Responding swiftly to the deteriorating patient (eg, through situational awareness, identifying and intervening when something goes wrong, knowing the importance of acute prevention, and implementing hazard reduction and reporting systems such as incident information management system [IIMS] and hazard registers).
- Adopting successful approaches to knowledge translation and the implementation of clinical guidelines, applying these to local conditions and understanding the possible constraints in health literacy in the local environment.
- Demonstrating good handovers and record keeping processes, including accessing and modifying electronic health records as required.
- Demonstrating good educational and presentation skills, planning and delivering good educational experiences for colleagues with differing levels of expertise. Understanding meta-cognition (ie, thinking about thinking) — for example, the use and shortcomings of mental heuristics, cognitive biases, clinical reasoning and knowing how doctors think.
- Demonstrating strong communication skills with staff, patients and carers.
- Implementing the overlapping roles of medical expert, health advocate, scholar, professional, communicator, collaborator and manager — for example, through consideration of the CANMED's domains (see Appendix 2).
- Acting as an effective manager in assisting in shaping the attitude of hospital teams. (eg, understanding what the local clinical environment can offer), holding corporate
hospital knowledge, promoting alternative solutions, building and using trust relationships and social capital.

- Practising niche skills and understanding the local niche requirements (e.g., the role of the dietician in total parenteral nutrition and re-feeding).

- Understanding the role of the doctor in the community, the epidemiology of the local area and the cultural mix and requirements of its communities.

- Predicting the nature of hospital work in 10 years (e.g., the effect of increasing obesity, responding appropriately to the needs of culturally and linguistically diverse patients, the impact of rising rates of poor mobility, psychosocial stress, mental illness, social fragmentation and increasing numbers of very old patients).

- Recognising the ecology of the local area, being a health advocate for disadvantaged social groups and assisting the health literacy of patients (e.g., preventing complications of age-related conditions).

- Developing planning and marketing skills — project management and continuity roles, change management, clinical redesign, research projects.

- Managing multiple roles in accreditation by HETI, the medical colleges, Quality Society of Australasia, Work Health and Safety, ACHS Evaluation and Quality Improvement Program (EQuIP) or equivalent, and providing a focus for medical quality improvement cycles.

The entrustable professional activities listed in Table 6.1 emerge from considering the holistic character of hospital practice, across the three broad categories of inpatients: acute, chronic and periprocedural. These topics and skills also contribute to identifying the requirements of system design.
### Table 6.1: System design and the characteristics of hospital practice

<table>
<thead>
<tr>
<th>EPA HM6.1 Minimise medical errors/sources and responses (HSP 3)</th>
<th>Acute patients</th>
<th>Chronic patients</th>
<th>Periprocedural patients</th>
</tr>
</thead>
</table>


| EPA HM6.3 Lead handover processes (HSP 2) | Conduct handover processes into and out of ED, into and out of ICU/HDU, out of hospital. Manage the Watch List. | Implement care and discharge planning systems. | Conduct urgent transfers and hand offs. |

| EPA HM6.4 Engage in advanced clinical reasoning (HSP 3) | Take history for different groups of patients. | Record management plans and apply e-records and problem lists. | Conduct reason for admission (RFA) surveys, care pathways, pre-admission clinics and implement delirium avoidance systems. |

| EPA HM6.5 Facilitate learning and teaching (HSP 3) | Deliver Learning On The Run, Teaching On The Run and develop care pathways for less experienced colleagues. | Conduct patient carer and family education and care planning. | Implement procedural guidelines and discharge advice as appropriate. |

<p>| EPA HM6.6 Demonstrate and promote leadership (HSP 3) | Provide appropriate management for clinician leaders. | Work appropriately with multidisciplinary teams. | Lead across traditional boundaries. |</p>
<table>
<thead>
<tr>
<th>EPA HM6.7 Solve problems in the local environment (HSP 3)</th>
<th>Acute patients</th>
<th>Chronic patients</th>
<th>Periprocedural patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPA HM6.8 Participate in clinical governance (HSP 3)</td>
<td>Participate in local safety committees, drug committees, recognise the APINCH list of high risk medications (antihypertensives, potassium, insulin, narcotics, chemotherapeutic agents, heparin).</td>
<td>Implement referral systems for timely allied health intervention. Discharge and admission documentation reviews.</td>
<td>Manage surgical load during low activity times, conduct reviews of timeliness and outcomes of transfers for offsite care.</td>
</tr>
<tr>
<td>EPA HM6.9 Manage conflict (HSP 2)</td>
<td>Effectively manage a discharge against medical advice.</td>
<td>Implement guardianship requirements as appropriate.</td>
<td>Manage differences of professional opinion.</td>
</tr>
<tr>
<td>EPA HM6.10 Assist the practitioner in difficulty (HSP 3)</td>
<td>Assess clinical competence and respond appropriately to working with impaired doctors.</td>
<td>Manage workloads across teams, respond appropriately with performance outliers and engage effectively with long term staff.</td>
<td>Manage after hour's workloads and call back systems.</td>
</tr>
</tbody>
</table>
References


Greater Metropolitan Transition Taskforce (2002) “Care of the acutely ill older person in greater metropolitan hospitals”.


RCA Team at RNSH (2011) RCA Summary.


Four levels of knowledge and performance elements have been defined in the patient safety framework. The level of knowledge and performance required by an individual is determined by their level of patient safety responsibility:

**Level 1**
Foundation knowledge and performance elements are required by all categories of health care workers (as defined below).

**Level 2**
Knowledge and performance elements are required by health care workers in categories 2 and 3.

**Level 3**
Knowledge and performance elements are required by health care workers in category 3.

**Level 4**
Organisational knowledge and performance elements are required by health care workers in category 4.

Some knowledge and performance elements in levels 2 and 3 may not be relevant for all non-clinical managers.

Four categories of health care workers have been defined in the patient safety framework.

**Category 1** Health care workers who provide support services (eg, personal care workers, volunteers, transport, catering, cleaning and reception staff).

**Category 2** Health care workers who provide direct clinical care to patients and work under supervision (eg, ambulance officers, nurses, interns, resident medical officers and allied health workers).

**Category 3** Health care workers with managerial, team leader and/or advanced clinical responsibilities (eg, nurse unit managers, catering managers, department heads, registrars, allied health managers and senior clinicians).

**Category 4** Clinical and administrative leaders with organisational responsibilities (eg, Chief Executive Officers, board members, directors of services and senior health department staff).

Health care workers can move to higher categories of the patient safety framework as they develop personally and professionally.

Appendix 2: CANMEDS domains

In 2001 the Royal College of Physicians and Surgeons of Canada developed a diagram that shows the seven CanMEDS roles and the relation between each.

Medical Expert:
“As Medical Experts, physicians integrate all of the CanMEDS roles, applying medical knowledge, clinical skills, and professional attitudes in their provision of patient-centered care. Medical Expert is the central physician role in the CanMEDS framework.”

Communicator:
“As Communicators, physicians effectively facilitate the doctor-patient relationship and the dynamic exchanges that occur before, during, and after the medical encounter.”

Collaborator:
“As Collaborators, physicians effectively work within a healthcare team to achieve optimal patient care.”

Manager:
“As Managers, physicians are integral participants in healthcare organizations, organizing sustainable practices, making decisions about allocating resources, and contributing to the effectiveness of the healthcare system.”

Health Advocate:
“As Health Advocates, physicians responsibly use their expertise and influence to advance the health and well-being of individual patients, communities, and populations.”

Scholar:
“As Scholars, physicians demonstrate a lifelong commitment to reflective learning, as well as the creation, dissemination, application and translation of medical knowledge.”

Professional:
“As Professionals, physicians are committed to the health and well-being of individuals and society through ethical practice, profession-led regulation, and high personal standards of behaviour.”

This case study from a root cause analysis team at a large teaching hospital illustrates the importance of the hospital-wide perspective advocated by the Hospital Medicine module to avoid problems such as suboptimal communication within and between clinical teams about the deteriorating clinical picture of a patient.

A 52-year-old man with a history of gastric banding for obesity (2009), gastric ulcer (2009), low haemoglobin requiring iron infusions and unstable Type II diabetes mellitus presented to a large emergency department (ED) following referral from his general practitioner (GP). The patient had presented to his GP for review of swelling in his left calf. He also reported a two month history of increased shortness of breath on exertion, postural dizziness, increased heartburn, malaena, and occasional band-like chest pain. The previous day the patient had seen his gastroenterologist (who had performed the original gastric banding surgery) and at that appointment the gastric band was loosened to relieve symptoms of reflux. The GP documented that she suspected ‘severe reflux esophagitis from the gastric band, which is bleeding and causing symptomatic anaemia’.

On presentation to the ED the patient was appropriately triaged. His observations were within normal limits, although a postural drop in his blood pressure was noted. An ECG was preformed showing sinus tachycardia. A chest x-ray was unremarkable. The patient was admitted under the appropriate team with a provisional diagnosis of ‘shortness of breath secondary to anaemia’. Due to ward closures for the Christmas period he was not admitted to the treating team’s ward.

During the second night following admission, the patient had seven episodes of clinical deterioration falling within the Yellow zone and one episode falling within the Red zone of the standard adult general observations (SAGO) chart. These episodes were related to desaturation and tachycardia. These episodes were not escalated as per the ‘Between The Flags’ guidelines. He also had two falls during his admission (no injury). ECG changes during his admission showed ST elevation and tachycardia, while his troponin levels were elevated and consistent with pulmonary emboli (PE). The patient also had an echocardiogram which suggested PE. He was reviewed daily by his treating team, but the staff specialist was not involved in ward rounds (this is standard for this procedural-based outpatient specialty). Medical review also included extensive review overnight which revealed a suspicion of PE, but evidence of clinical handover was limited.

Findings of a gastroscopy/endoscopy were consistent with the provisional diagnosis. During this procedure, the patient again desaturated and required anaesthetic reversal. While in the unit for these procedures, the staff specialist and patient discussed his discharge and, although the staff specialist would have preferred the patient to remain as an inpatient overnight, due to the patient’s insistence that he be discharged, it was agreed that he be discharged home later that afternoon. The staff specialist was unaware of any episodes of clinical deterioration of the patient, falls or echocardiogram results during the admission.

Before discharge, the patient was reviewed by the junior member of the medical team and in light of the patient’s clinical condition was again reviewed by the registrar. The patient’s saturation levels at this time fell within the Red zone of the SAGO chart. Despite this, he was discharged home.

Later that evening, the patient developed shortness of breath, chest tightness and epigastric pain and an ambulance was called. When it arrived, the patient complained of a sudden onset of chest pain and dyspnoea, and lost consciousness. He remained in asystole and was transported to the same ED where continued resuscitation attempts were unsuccessful. His death was referred to the Coroner.
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