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LITERATURE REVIEW

HIRAID: An evidence-informed emergency nursing assessment framework

Belinda Munroe, RN, MNurs (AdvPrac), PhD Candidate ^{a,b,*}

Kate Curtis, RN, PhD ^{a,b,c}

Margaret Murphy, RN, MHLthSc(Ed) ^{a,d}

Luke Strachan, NP, GradCertCCN, MNurs(NursPrac) ^e

Thomas Buckley, RN, PhD ^a

^a Sydney Nursing School, University of Sydney, Australia

^b Emergency Department, The Wollongong Hospital, Australia

^c St George Hospital Trauma Service, Australia

^d Emergency Department, Westmead Hospital, Australia

^e Emergency Department, Blacktown Hospital, Australia

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Summary

Introduction: Emergency nurses must be highly skilled at performing accurate and comprehensive patient assessments. In 2008, the inaugural emergency nursing assessment framework (ENAF) was devised at Sydney Nursing School, to provide emergency nurses with a systematic approach to initial patient assessment. In 2014 the assessment framework was re-developed to reflect the most recent evidence.

Aim: To describe the process and evidence used to re-develop ENAF, to provide ED nurses with an evidence-informed approach to the comprehensive assessment of patients presenting to ED after triage, so that it may be implemented and tested in the clinical (simulated) setting.

Methods: A thorough literature review was conducted to inform the re-development of ENAF. Literature review findings were reviewed and ENAF was re-developed by a panel of expert emergency nursing clinicians using the Delphi Technique.

Results: Modifications to ENAF were undertaken and a new, more comprehensive assessment framework was developed titled 'HIRAID'. HIRAID is informed by current evidence, comprising of seven assessment components: History; Identify Red flags; Assessment; Interventions; Diagnostics; reassessment and communication.

* Corresponding author at: The Wollongong Hospital, Emergency Department, Crown St, Wollongong, NSW 2500, Australia. Tel.: +0242225332.

E-mail addresses: belinda.munroe@sesiahs.health.nsw.gov.au, bmun1400@uni.sydney.edu.au (B. Munroe).

Conclusion: HIRAID provides an evidence-informed systematic approach to initial patient assessment performed by emergency nurses after triage. Evaluation is now needed to determine its impact on clinician performance and patient safety.

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What is known

- Emergency department (ED) nurses must be highly skilled at performing comprehensive patient assessments to determine the urgency and treatment needs of undifferentiated patients presenting to the ED.
- A structured approach to patient assessment can enhance clinical performance and has the potential to improve patient care delivery.
- The Emergency Nursing Assessment Framework (ENAF) was developed in 2008 as part of a university curriculum to guide ED nurses approach to initial ED nursing patient assessment.

What this paper adds?

- A revised assessment framework, HIRAID, depicts the current available evidence for emergency nursing patient assessment in a clear and concise manner.
- The HIRAID framework provides a structured, evidence-informed approach to the initial nursing assessment of patients presenting to the ED after triage.
- The HIRAID framework encapsulates the complex and continuous process of nursing assessment in the ED, comprising of the seven critical components: *History; Identify Red flags; Assessment; Interventions; Diagnostics; reassessment; and communication.*

Introduction

The prominence of undifferentiated patients presenting to the emergency department (ED) without a clear medical diagnosis or baseline data to distinguish between the well and critically ill, requires ED nurses to be highly skilled at performing accurate and timely patient assessments. When patients first present to the ED, the triage nurse performs a brief assessment and allocates a triage category indicating the level of urgency of the presenting problem (how long the patient can wait to be seen by a medical officer).¹ After triage patients are normally located to a treatment area and the allocated nurse is responsible for performing a more comprehensive assessment and commencing nursing care.

ED nurses' ability to perform an accurate initial comprehensive patient assessment after triage is imperative to recognise the urgency and treatment needs of patients and to develop baseline data from which any changes in

the condition of patients may be measured against. This can be challenging due to the chaotic environment of the ED with nurses experiencing frequent interruptions, primarily related to face-to-face communications² and heavy workloads.³ Failure to perform timely and accurate patient assessments has been reported to result in adverse patient outcomes.⁴

Historically, it has been recommended for nurses to have experience in critical care settings before commencing work in the ED to meet these essential skills of assessment.⁵ However today, in many Australian hospitals, new graduate nurses may start their nursing careers in the ED, with minimal prior clinical experience performing initial patient assessments.

Theoretical frameworks provide a structure for nursing practice and guide decision-making processes of clinicians.⁶ A structured approach to patient assessment has been shown to enhance clinician performance and has the potential to improve the delivery of care and subsequent patient outcomes.⁷ Only one literature review was found to evaluate assessment frameworks designed to guide the comprehensive assessment of patients in the acute setting.⁷ The review was unable to identify any evidence-based assessment framework designed to guide the general comprehensive nursing assessment of patients presenting to ED.⁷ Such a standardised approach would likely enhance the assessment skills of ED nurses and contribute to the delivery of safe patient care.

The need for an emergency nursing assessment framework was initially recognised by a team of academics from the Sydney Nursing School, University of Sydney whilst reviewing the Emergency Nursing Post Graduate course curricula in 2008.⁸ A theoretical framework was considered necessary to guide the comprehensive assessment of patients performed by ED nurses after triage, based on existing knowledge surrounding emergency nursing practice and the demands of the clinical environment. The nursing process provides an organised, logical way for nurses to problem solve and meet the needs of patients expressing nursing practice in five stages: *assessment, diagnosis, planning, implementation and evaluation.*⁹ As nursing practice varies considerably between specialty care areas it cannot be accurately captured in one theoretical model.¹⁰

The emergency nursing assessment framework (ENAF) was subsequently devised by three highly experienced emergency nurse consultants in collaboration with an education consultant.⁸ ENAF depicts the emergency nursing assessment process from when the patient first presents to the ED (after triage) until despatch, when patients leave the ED having been discharged or transferred to another ward or hospital. It consists of five steps: *history; red flags; assessment; interventions; and investigations*, which may

be conducted as separate steps or simultaneously whilst continuing to evaluate patient progress and communicating with patients, families and other health clinicians. ENAF was developed based on expert opinion and founded on the theoretical underpinnings of the nursing process.⁸

A more focused approach is necessary to depict the distinguishing features of specific fields of nursing and hence the inaugural ENAF was devised.⁸ An up to date and evidence-informed emergency nursing assessment framework is however still needed to inform ED nursing practice based on sound research evidence, particularly given the lack of standardised approach to initial nursing assessment.⁷ ENAF was therefore re-developed to reflect current evidence, so that it may be implemented and tested in the clinical (simulated) setting to inform clinical practice.

Aim

To describe the process and evidence used to re-develop ENAF, to provide ED nurses with an evidence-informed, structured approach to the comprehensive assessment of patients presenting to the ED, performed after triage.

Methods

The *Knowledge to Action Cycle* guided the re-development of ENAF. The Knowledge to Action Cycle informs researchers the sequence of steps involved in achieving the transfer of research knowledge into clinical practice consisting of two phases: Knowledge Creation and the Action Cycle (see Fig. 1).¹¹ The initial creation phase highlights the importance of synthesising existing knowledge as part of generating new tools to guide practice in response to an identified problem. These steps must be undertaken to ensure knowledge is founded on the best available evidence prior to progressing to the Action Cycle which describes the process of implementing and evaluating new knowledge in clinical practice.¹¹

The re-development of ENAF was guided by the knowledge creation phase of the Knowledge to Action Cycle which comprises of the synthesis and generation of knowledge.¹¹ A literature review was firstly conducted to aggregate existing knowledge on emergency nursing assessment and to determine if ENAF was reflective of current evidence (knowledge synthesis). Findings from the literature review were peer reviewed by a panel of expert emergency nurses and ENAF was re-developed using the Delphi technique (knowledge generation). These two steps are presented in detail below.

Step 1: literature review (knowledge synthesis)

A comprehensive search and critique of the literature surrounding emergency nursing practice and patient assessment was firstly conducted to identify the fundamental components of the emergency nursing assessment process and to ascertain if ENAF reflected current evidence. Electronic databases Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Medical Literature Analysis and Retrieval System (Medline) were used to search for primary and secondary research studies. A manual search of

reference materials such as relevant textbooks and clinical guidelines was also conducted. The following search terms were used: *emergency, emergency department, emergency medical services, emergency medicine, nurse, nursing, registered nurse, emergency nurse, structure, framework, model, history, history taking, patient interview, patient history, red flags, historical indicators, physiological indicators, cues, assessment, physical examination, patient assessment, clinical examination, initial assessment, nursing assessment, health assessment, interventions, nursing care, patient care, treatment, diagnostics, laboratory tests, reassess, evaluation, outcomes, communication, clinical handover and documentation*. Results were limited to English. No date limit was set.

Step 2: re-development of ENAF (knowledge generation)

The Delphi technique was used to obtain the judgements from an expert panel of ED nurses to determine if any modification to ENAF were needed. An 'expert' nurse is defined by Benner as a nurse with both practical and theoretical knowledge enabling them to make sound clinical judgements.¹² The Delphi technique is a method for determining best practice standards when there is little evidence available and expert opinion is considered important.¹³ It is an interactive process that involves structured feedback usually in two to four rounds to reach consensus.¹⁴

In the re-development of ENAF, an expert panel was formed consisting of Registered Nurses currently working in an ED with postgraduate qualifications in ED nursing and ability to demonstrate achievement in the Practice Standards for the Emergency Nursing Specialist.¹⁵ Three rounds of feedback were carried out, the first two involving online communication through email and the third and final round using face to face discussion. A consensus level is usually set prior to the study influenced by the objectives and implications for practice.¹⁶ Given the concerns surrounding patient safety relating to nursing assessment in the ED majority consensus was set as a pre-requisite.

Round one

A summary of the literature review findings were categorised into the seven assessment components represented in ENAF and distributed via email for peer review by a panel of experienced emergency nurses including a clinical nurse specialist, nurse practitioner, clinical nurse consultant and doctoral trained clinical nurse consultant. The reviewers were asked to comment on whether the literature findings were complete and reflective of their knowledge of current literature surrounding emergency nursing and patient assessment, and to describe and justify if any modifications to ENAF were indicated.

Round two

Reviewer responses were summarised and fed back to the panel in a second round of emails. The panel were asked to state whether or not they agreed with the proposed changes.

Figure 1 Knowledge to Action Cycle.¹¹

Round three

Proposed changes which received majority consensus from the feedback provided in round two were applied to ENAF and the framework was modified. The re-developed assessment framework was then presented to the peer review committee in a face to face meeting. Reviewers were asked to state if they agreed or disagreed with the re-developed assessment tool including the assessment components and framework structure.

Results

ENAF was re-developed to reflect the current evidence on initial nursing patient assessment in the ED and re-named 'HIRAID' to represent the first letter of each of the emergency nursing assessment processes. Varying levels of evidence were identified through the literature review relating to emergency nursing practice and patient assessment, with the majority of literature consisting of expert recommendations and studies relating to specific patient presentations or diagnoses. Refer to Table 1 for a summary of the main sources of evidence informing the HIRAID framework. All modifications suggested by reviewers were agreed upon by the panel and applied to the pre-existing ENAF. 100% consensus was achieved upon the final review of the re-developed HIRAID assessment framework. See Table 2 for a summary of modifications made to ENAF and rationale provided.

HIRAID

The HIRAID emergency nursing assessment framework is an evidence-informed theoretical structure designed to provide emergency nurses with a systematic approach to

initial and ongoing comprehensive patient assessment from the time the patient presents to the ED (after triage), through to despatch (Fig. 2). HIRAID consists of seven components: collecting a patient History; Identify Red flags; performing a physical Assessment; Interventions; and Diagnostics; whilst continuing to reassess and communicate. These steps maybe undertaken singularly or simultaneously as emergency clinicians are often required to perform multiple tasks at the same time both individually and as part of a team.¹⁷ The HIRAID nursing assessment processes are presented in Table 3. A summary of evidence informing the seven components of the HIRAID assessment framework is presented below.

History

It is consistently agreed in the literature that history taking is the first stage of nursing assessment. History is a core ingredient of the assessment process, forming the basis for the majority of diagnoses.¹⁸ Whilst traditionally viewed a medical responsibility,¹⁹ history taking is now also considered a nursing responsibility. Australian ED nurses are often required to interview, assess, commence diagnostics and treatment and determine the urgency of care before the patient is seen by a medical officer.²⁰ Historical information about why patients present to the ED and potentially contributing factors relating to their condition is necessary to guide the nurse on what body regions to focus their assessment, determine what investigations are indicated and inform priorities of patient care.²¹

Nursing education literature recommends that a patient's history should comprise of details about the patient's presenting problem and individual health history.^{22,23} Various

Table 1 Summary of the main sources of evidence informing the HIRAIID assessment framework.

Recommendation	Author	Method, expertise and findings	Justification
Collection of patient history	Peterson et al., 1992 [18]	Empirical study examining medical officers' confidence in formulating medical diagnoses for 80 patients after taking a patient history, performing physical examination and after laboratory investigations. The study reported that the history led to the correct medical diagnosis in 76% of patients.	Collection of patient history informs medical diagnoses.
	Patel and Curtis 2011 [23]	Textbook chapter on patient assessment by a doctoral trained emergency nurse and triage nurse. The chapter teaches that both details about the presenting problem and individual health history should be collected as part of the patient history.	Knowledge of the patient's presenting problem and individual health history is necessary to direct which body systems need to be assessed.
	Lloyd and Craig 2007 [22]	Descriptive paper by two senior nursing lecturers in a peer review nursing journal. The article presents an argument why history taking should follow a structured approach, including details about the patient's presenting complaint and health history.	Collection of the presenting complaint and health background is necessary to inform clinicians of patient symptoms and to ascertain what body regions need to be examined.
Identification of red flags	Jacques et al. 2006 [29]	<i>SOCGER study</i> Cross-sectional survey which reviewed 3046 medical records of non-Do Not Attempt Resuscitation adult admissions over five Australian Hospitals for early and late signs of critical conditions and serious adverse events (death, cardiac arrest, severe respiratory problems, or transfer to a critical care area) ²⁹ Early and late physiological signs were reported as strong predictors of critical illness and serious adverse events.	Recognition of early and late physiological signs (red flags) may be used as predictors of critical illness and serious adverse events, to promote early intervention and prevent patient deterioration.
	Konrad et al. 2009 [31]	Prospective study evaluating the impact of Medical Emergency Team (MET) criteria and response on in-hospital arrests and hospital mortality in a Swedish Hospital. A significant reduction in cardiac arrest rates and mortality was reported after the introduction of MET criteria and response teams.	Recognising signs of clinical deterioration (red flags) early enables a timely response and delays time to treatment reducing in-hospital arrests and mortality rates.
	Acute Coronary Syndrome Guidelines Working Group 2006 [27]	<i>Acute Coronary Syndrome (ACS) guidelines</i> Presents recommendations for the management of ACS based on research evidence. Summarises key physiological signs such as ST-elevation and historical factors such as hypertension, smoking and previous coronary artery interventions that increase risk of ACS.	Historical and clinical factors highlight risk of serious illness.
Primary survey to commence physical examination	Considine and Currey 2014 [34]	Position paper by two doctoral trained Emergency Nurses in peer reviewed journal. Examines different approaches to patient assessment and presents evidence that indicates the primary survey should be used as the first element of patient assessment in every patient encounter.	The primary survey acts as a safety checklist, ensuring that data is collected in the order of clinical importance and decreasing the risk of failure to recognise life threatening conditions.
	Australian Resuscitation Council 2011 [35]	<i>Basic and Advanced Life Support guidelines</i> The Australian Resuscitation Council guidelines are based on scientific evidence and consensus of opinion of clinicians involved in the teaching and practice of resuscitation. The primary survey approach commences the assessment of the collapsed patient to provide ventilation and circulation, increase the likelihood of successful defibrillation if required and allow time for irreversible causes to be diagnosed and treated.	The primary survey optimises survival in the unconscious patient.

Table 1 (Continued)

Recommendation	Author	Method, expertise and findings	Justification
Head-to-toe approach to assessment	American College of Surgeons 2012 [25]	<i>Advanced Trauma Life Support (ATLS) guidelines</i> The American College of Surgeons is a professional organisation founded to provide quality health care through setting education and practice standards for surgeons. The ATLS guidelines were developed to improve the management of severely injured trauma patients based on current evidence and expert opinion. The primary survey is taught as a standardised approach to commencing the assessment of severely injured trauma patients.	The primary survey approach ensures life threatening conditions are identified and treated first, reducing loss of life.
	Farrell 2010 [37]	Textbook chapter by a doctoral trained nurse and research scientist which teaches a head-to-toe approach to nursing assessment.	A head-to-toe approach to assessment ensures all relevant body systems are assessed.
	American College of Surgeons 2012 [25]	<i>Advanced Trauma Life Support guidelines</i> A head-to-toe approach is taught as part of the secondary survey following the primary survey.	Head-to-toe approach to assessment ensures all injured body regions are assessed, reducing the incidence of missed injuries.
Collection of vital signs	Patel and Curtis 2011 [23]	Textbook chapter on patient assessment for paramedics and ED nurses, written by a doctoral trained emergency nurse and triage nurse.	A head-to-toe approach to assessment following the primary survey ensures all relevant body regions are assessed.
	National Institute for Health and Care Excellence (NICE) [39] Joanna Briggs Institute (JBI) [40]	Guidelines for the recognition and response to acute illness in hospitalised adults. NICE is a United Kingdom non-department public body which carries out assessments of the most appropriate treatment for various patient groups. Information sheet presenting evidence on vital signs. JBI is a not-for profit international organisation which supports research in health sciences.	Vital signs are necessary to inform clinical decisions about care and treatment of the acute patient. Vital signs are required to determine the physiological condition of patients and monitor patient progress.
	Hoskings et al. 2014 [41]	Exploratory descriptive study which reviewed medical records of 200 patients admitted to an Australian ED to examine the frequency, nature and clinical deterioration of ED patients and compare the use of the hospital MET criteria with an ED specific calling criteria for recognising clinical deterioration. The study reported that an ED specific criteria (comprising of vital signs and other clinical indicators) for activation of a rapid response team would identify more patients at risk of clinical deterioration.	Vital signs assist in the recognition of patients at risk of clinical deterioration.
Prioritised and evidence-based nursing interventions	Schuster et al. 2005 [47]	Literature review which examined studies on the quality of health care in the United States published from 1993 to 2010. The paper reported that patient care is often not evidence-based resulting in inappropriate and potentially harmful care being delivered to patients.	Patient care must be evidence-based to prevent unnecessary and potentially harmful care.

	College of Emergency Nursing (CENA) 2013 [15]	<p><i>Performance Standard for the Emergency Nurse Specialist</i></p> <p>Performance criteria:</p> <p>1.2c 'Prioritises nursing interventions according to presenting patient symptoms and needs'</p> <p>9.2i 'Promotes a culture of research and evidence-based practice within the emergency care environment'</p> <p>CENA is a peak professional body representative of emergency nurses across Australasia. The practice standards were developed with the input of expert emergency nurses to articulate the characteristics of emergency nurse specialists to deliver timely and quality patient care.</p>	The delivery of prioritised and evidence-based care ensures the delivery of quality patient care necessary to optimises patient outcomes.
Ordering of diagnostic tests	<p>Retezer et al. 2011 [50]</p> <p>Considine et al. 2013 [53]</p>	<p>Retrospective study compared mean time of patients who received triage diagnostic standing orders with those who received orders once placed in a treatment room. Patients who received diagnostic orders by nurses at triage waited significantly less time to treatment.</p> <p>Prospective exploratory study evaluated a nurse initiated-ray education programme on the appropriateness of X-rays orders in the ED. The study showed a statistical significant improvement in the incidence of appropriate nurse initiated X-rays in nurses who undertook the education programme compared to nurses who didn't.</p>	<p>Ordering of diagnostic tests by triage nurses reduces time to treatment.</p> <p>Nurses may be trained to order appropriate diagnostic tests.</p>
Ongoing reassessment of patents	<p>Jones et al. 2014 [55]</p> <p>College of Emergency Nursing Australasia (CENA) 2014 [15]</p>	<p>An exploratory study reviewed audio-recordings of interviews with 71 Australian Registered Nurses, 19 of which worked in ED to determine how nurses anticipate, detect and bridge gaps in care. The ongoing assessment and monitoring of patients was a reported as a key theme.</p> <p><i>Performance Standards for the Emergency Nurse Specialist</i></p> <p>Performance criteria:</p> <p>1f 'Conducts ongoing timely and appropriate reassessment of patient'</p> <p>CENA is a peak professional body representative of emergency nurses across Australasia. The practice standards were developed with the input of expert emergency nurses to articulate the characteristics of emergency nurse specialists to deliver timely and quality patient care.</p>	<p>The ongoing assessment of patients is necessary to identify and prevent gaps in care and optimise patient safety.</p> <p>The appropriate reassessment of patients ensures the delivery of quality patient care necessary to optimise patient outcomes.</p>
Effective communication with patients using AIDET	Studer Group 2013 [62]	Healthcare organisation in the United States, Australia, Canada and New Zealand established to improve health care for staff and patients. AIDET is a communication strategy designed to improve communication between health clinicians and patients.	AIDET prompts clinicians to make patients feel safe and calm, and gather key pieces of information needed to treat patients safely

Table 1 (Continued)

Recommendation	Author	Method, expertise and findings	Justification
Structured approach to clinical handover	Kelly and Faraone 2013 [63]	Implementation study examines the impact of a communication training programme which teaches AIDET principles and service recovery techniques across two EDs. Findings reported improvements in both staff and patient satisfaction.	AIDET communication principles positively contribute to both staff and patient satisfaction in the ED.
	Australian Commission on Quality and Safety in Health Care 2009 [68]	Intervention study examined the impact of a standardised format 'ISBAR' on inter-hospital handover across three facilities in NSW as part of the National Clinical Handover Initiative. The use of ISBAR was reported to improve clinician confidence, quality of the handover process, patient satisfaction and quality of clinical documentation.	A structured approach to clinical handover improves clinician confidence, quality of the handover process and clinical documentation
	Marshall et al. 2009 [69]	Intervention study compared a control and intervention group to determine if an education programme teaching the 'ISBAR' communication tool improved telephone communication of final medical students in a simulated setting. Findings reported significant higher communication content and clarity in the intervention group.	A structured approach to communication improves the clarity and content of communication.
Assertive communication with other health professionals	Curtis et al. 2011 [70]	Clinical Nurse Consultant/Nursing Professor and Emergency physician recommend the use of graded assertiveness to improve communication between nurses and doctors. Recommendations are founded on clinical experience and findings from an integrative review conducted to identify problems related to communication between nurses and doctors.	Graded assertiveness assists nurses to raise concerns about patients and promote patient safety.
	Attree 2007 [71]	Grounded theory used to analyse semi-structured interviews of 142 practicing nurses from three Acute NHS Trusts in England to explore factors that influence nurses' decisions to raise concerns about standards of practice. Findings reported nurses lacked confidence in reporting patient concerns.	Nurses' often lack the confidence to communicate assertively preventing them from reporting patient concerns, potentially impairing the safety of patients.
Complete and accurate documentation	Urquart et al. 2009 [72]	Cochrane systematic review conducted to assess the effects of nursing record systems on nursing practice and patient outcomes. Nursing records were described as a way for nurses to share information about patient care with other nurses and health professionals.	Nursing clinical records must be complete and accurate to reliably communicate patient information to other nurses and health professionals involved in the patient's care.
	Chiarella 2014 [74]	Presentation by lawyer and nursing professor at an international conference for ED nurses. Discusses the importance of accurate nursing notes to provide sufficient lawful evidence of care provided to patients.	An accurate and complete nursing record is a legal requirement necessary to provide lawful evidence of care provided to the patient.

Table 2 Modifications to ENAF.

Modification	Rationale
Red flags re-termed 'identify red flags'	The addition of the word "identify" clarifies that the nurses must consider what red flags are present
Interventions precedes investigations	Nurses are often required to perform interventions in response to assessment findings before investigations are performed
Investigations re-labelled 'diagnostics'	Forms HIRAIID mnemonic
Title changed from 'ENAF' to 'HIRAIID'	Mnemonic designed to aid memory of assessment components by reflecting the first letter of the different assessment components

Figure 2 HIRAIID: an evidence-informed emergency nursing assessment framework © adapted from Curtis et al.⁸

mnemonics exist, designed to provide a generic approach to the collection of a patient's history such as OLD CARTS (Onset, Location, Duration, Characteristics, Aggravating or relieving factors, Related symptoms, Treatment and Severity)²⁴ and AMPLE (Allergies, Medications & Immunisations, Pertinent history, Last meal and Events/environment relating to presentation).²⁵ However no evidence was identified that demonstrate these mnemonics enhance the history taking process.

Identify red flags

Timely recognition of red flags is fundamental in detecting deterioration and determining the urgency of treatment

required. Red flags are defined as historical factors and clinical signs that indicate patients are either critically ill or injured, or hold the potential to deteriorate rapidly requiring urgent medical intervention.⁸ Historical red flags may be related to the chief complaint such as the symptom of '*chest pain*' which can indicate the patient requires urgent medical attention due to the risk of myocardial injury.²⁶ Historical red flags may also be related to patients' individual health history highlighting an increased risk of illness or injury, such as hypertension which increases the risk of acute coronary syndromes.²⁷ Clinical red flags include abnormal vital or physiological signs obtained during the physical assessment indicating severe injury or illness. A clinical indicator might include hypotension, tachycardia, pallor or a

Table 3 Summary of HIRAID nursing assessment processes.*H – history*

The first step in the assessment process. Involves collection of the:

- Presenting problem (why patient presented to the ED); and
- Individual health history.

IR – identify red flags

Historical and physiological indicators of urgency necessary to recognise potential and actual signs of serious illness or injury. The ED nurse should:

- Identify red flags early; and
- Notify presence of red flags to a senior ED medical officer as soon as possible.

A – assessment

The clinical examination of the patient. Assessment should include:

- The primary survey;
- A focused head-to-toe assessment;
- Vital signs; and
- Inspection, auscultation, percussion and palpation techniques.

I – interventions

Patient care delivered either directly or indirectly with the patient. Interventions should be:

- Evidence based; and
- Prioritised based on assessment findings.

D – diagnostics

Investigations necessary to gain an overall clinical picture of the patient and inform treatment decisions. ED nurses have a key role in:

- Ordering, performing and reviewing diagnostics; and
- Ensuring diagnostics are performed in a timely manner

Reassessment

The evaluation of care and monitoring of patient progress. Reassessment should:

- Maintain a structured approach; and
- Be repeated at appropriate intervals according to the condition of the patient.

Communication

Verbal and non-verbal communication skills are necessary to effectively communicate with patients, families and other health professionals. ED nurses should practice the following strategies to optimise communication:

- AIDET principles when communicating with patients;
- A structured approach to clinical Handover (ISBAR);
- Graded assertiveness to escalate care; and
- Accurate and complete clinical documentation.

rigid abdomen revealing the need for urgent intervention in patients presenting to the ED with abdominal pain.²⁸ Early and late signs of clinical deterioration including abnormal vital signs and other clinical data have been reported as strong predictors of critical conditions and adverse events such as cardiac arrest or death.²⁹

Studies have reported that the processing of incoming information, including the collection and clustering of cues is a vital step in making decisions about patient care.³⁰ The identification of red flags may therefore assist ED nurses in recognising and responding to severely unwell patients. Timely recognition of clinical deterioration allows for appropriate clinical response and management, reducing the incidence of in-hospital arrests and hospital mortality.³¹

The detrimental effects of patient deterioration on patient morbidity and mortality rates have resulted in recommendations that all Australian acute care settings have systems in place for the recognition and response to clinical deterioration.³²

Whilst there have been various early warning systems introduced in Australia and worldwide there is no universal system to prompt ED and ward nurses to recognise both historical and physiological red flags. Clinical pathways for specific presentations such as sepsis have been implemented to assist ED nurses in identifying historical and physiological red flags and notifying a senior medical officer early resulting in a reduction in mortality rates.³³ ED nurses must however be prepared to recognise and respond to red flags

arising from a diverse range of clinical conditions which patients may present with.

Assessment

Assessment refers to the physical examination of patients. The collection and interpretation of clinical information is considered a core role of the ED nurse.¹⁵ The evidence consistently reports that patient assessment should begin with a primary survey approach (assessment of airway, breathing, circulation and disability) to ensure life threatening conditions are identified and treated first.³⁴ The primary survey acts as a safety checklist, ensuring that data is collected in the order of clinical importance and decreasing the risk of failure to recognise life threatening conditions.³⁴ This approach is universal with similar versions taught in Basic and Advanced Life Support³⁵ and Advanced Trauma Life Support.²⁵

Once the primary survey is complete focused nursing assessments are necessary to investigate specific body regions or systems. Patients with a limb injury for example should have neurovascular observations of the affected limb/s, to determine if there is any neurovascular compromise to the limb and need for escalation and treatment to prevent secondary injury.³⁶ A head-to-toe approach directed by the patient's history and presenting signs and symptoms is recommended as it is thought to ensure that all relevant body regions and systems are assessed when performing focused assessments.^{37,38} However no studies were found to show that a head-to-toe approach resulted in a more complete assessment.

The detection of abnormal vital signs in conjunction with other clinical red flags can lead to the early detection of deterioration²⁹ and decrease mortality rates.³¹ The National Institute for Health and Care Excellence (NICE) recommend at minimum the collection of the following six core physiological vital signs as part of the initial patient assessment: respiratory rate, heart rate, temperature, oxygen saturation, blood pressure and level of consciousness.³⁹ Routine monitoring of pain is also recommended depending on the circumstances.³⁹ Collection of vital signs is necessary to determine the physiological condition of patients, to use as a baseline to monitor patient progress⁴⁰ and detect deterioration.⁴¹

Inspection, auscultation, percussion and palpation are commonly taught as essential techniques of physical assessment^{23,42,43} and are widely used in the clinical setting. The identification of specific signs and symptoms necessary for formulating diagnoses is dependent on the application of these techniques, however they can generate false-negative and false-positive results.⁴³ Signs and symptoms detected through inspection, auscultation, percussion and palpation should therefore be considered in collaboration with other clinical data when forming decisions about investigations and treatment needs.

The importance of general nursing assessments is also highlighted in the literature necessary to identify and respond to patients' inability to perform everyday tasks such as eating and drinking, communication, working, toileting, personal cleansing and dressing, and mobility.⁴⁴ A decline in patients' ability to perform these functions can threaten

the safety of patients whilst admitted to hospital and once discharged. Identification of such threats has been shown to prevent adverse outcomes, such as recognition of poor mobility which is often a major risk factor for falls in older adults, leading to severe injuries, loss of independence and death.⁴⁵

Interventions

Nursing interventions includes treatment performed by the nurse, either nurse initiated or at the request of another clinician. Treatment may be carried out either directly with the patient, such as dressing a patient's wound, or indirectly, such as providing support for family members.⁴⁶

Timely and evidence-based nursing care founded on correct interpretation of assessment findings is identified in the literature as a core role of the ED nurse.¹⁵ Failure to provide evidence-based care can result in patients receiving care that is not indicated or that is harmful.⁴⁷ The time to nursing care in the ED is also known to impact on patient outcomes. The timely administration of antibiotics and fluid resuscitation in septic patients for instance has been attributed to the early identification and response by the ED nurse reducing patient morbidity and mortality rates.⁴⁸ ED nurses must ensure interventions are prioritised to ensure patients receive the most urgent treatments first and as they are often required to perform multiple tasks at once.¹⁷

Diagnostics

Diagnostic and laboratory data are needed to develop an overall clinical picture of patients' physical conditions, diagnose or exclude disease and inform treatment decisions. A range of diagnostic tests are performed in the ED depending on the facility and types of presentations seen, often guided by protocols. The evidence shows that ED nurses have a vital role in ensuring investigations are indicated and are ordered, performed and reviewed in an opportune timeframe. Patients who present to the ED and undergo diagnostic testing are reported to have a longer length of stay than patients just receiving treatment.⁴⁹ ED nurses have been reported to reduce time to treatment through the initiation of specific diagnostic tests.⁵⁰ Electrocardiogram for example are commonly performed by the ED nurse within 10 min of the patient arriving to the ED to diagnose myocardial ischaemia and infarction and instigate reperfusion therapy early if indicated.⁵¹ X-rays can be requested by nurses to expedite identification and management of fractures.^{52,53}

Reassessment

Reassessment and evaluation of care in the ED is essential to ascertain patient progress and response to interventions. This involves the measurement of vital signs at appropriate intervals, evaluating the effects of treatment and ongoing review of patients' overall condition. For example, the reassessment of respiratory function in patients with asthma is necessary to determine if treatment is effective to identify the need for further treatment and hospital admission.⁵⁴

The ongoing assessment and monitoring of patients is considered vital to prevent gaps in care and optimise patient safety.⁵⁵ Repeating the primary survey followed by relevant focused assessments is key to maintaining patient safety during their admission to the ED as this approach has been shown to optimise the recognition of patient deterioration.³⁴

Frequent monitoring of vital signs in the ED is essential to maintain patient safety, as the greater time between vital signs can lead to errors and failure to detect changes in patients' conditions.⁵⁶ No standard agreement exists on the correct frequency vital signs should be performed.⁵⁷ The ED nurse must therefore be guided by the condition of each patient and local department policies.

Communication

ED nurses experience frequent interruptions, 95% of which are attributed to face-to-face communication.⁵⁸ Poor communication can lead to missed nursing care,⁵⁹ transfer delays⁶⁰ and extended hospital stays.⁶¹ Effective verbal and non-verbal communication are essential skills required of the ED nurse to interact with patients and their families, and to collect and disseminate patient information, which is imperative to facilitate safe and quality patient care.

Communication with patients

ED nurses must practice effective interviewing skills ensuring to listen, observe and question patients to obtain an accurate patient history and ascertain the type and severity of their symptoms.¹⁹ The Studer Group recommends the use of AIDET, a mnemonic which prompts the use of five principles to promote patient satisfaction during clinician patient interaction: Acknowledge the patient; Introduce yourself, Duration of procedures/tests/interaction (inform patient of time frames); Explanation of procedures/tests/interaction and Thank the patient for their cooperation.⁶² The five principles of communication encapsulated in the mnemonic has been reported to prompt clinicians to make patients feel safe and calm, and gather key pieces of information needed to treat patients safely,⁶² improving patient and staff satisfaction.⁶³ Patients and visitors highly value nurse-patient communication efforts, particularly when nurses offer reassurance to calm fears and teach about primary medical concerns/conditions.⁶⁴ It is therefore vital that ED nurses provide information and explanations about the provision and plan for care to their patients.

Communication with health professionals

Clinical handover is the essential process of exchanging patient data between health clinicians.⁶⁵ Clinical handover in the ED have been reported as high risk of adverse outcomes, as a result of omitting vital pieces of patient information leading to delays in diagnosis and treatment.⁶⁶ In 2009 the World Health Organisation listed clinical handover as one of the top five areas requiring improvement to enhance patient safety in health care.⁶⁷ In response Australia now has a national strategy which teaches clinicians to use the ISBAR framework (Introduction, Situation, Background, Assessment and Recommendations) to improve

the handover process.⁶⁸ A structured approach to clinical handover has been reported to improve clinician confidence, quality of the handover process and clinical documentation.^{68,69}

As ED nurses are responsible for the continuous monitoring of patients they must voice their concerns to medical practitioners or escalate care when red flags are identified to ensure patients receive timely care and prevent deterioration. However nurses often report a lack of confidence in raising clinical concern to medical officers which can impair the transfer of important patient information between nurses to medical staff.^{70,71} Graded assertiveness is a four step strategy initially developed for use in aviation, recommended to nurses to raise concern and promote patient safety.⁷⁰

Documentation

ED nurses must ensure clinical notes are complete and up to date to communicate patients' plan and progress to other health clinicians.⁷² Clinical notes should include admission data, findings and interpretation of assessments, interventions performed, treatment outcomes and patient progress.⁷³ Patient notes may be referred to by other health clinicians also responsible for the patient during their admission to ED, once transferred to a ward or upon repeat presentations to hospital. Accurate documentation of nursing care is also a legal requirement necessary to provide sufficient lawful evidence to support care provided to patients.⁷⁴

Future directions

HIRAID depicts the current available international evidence in a clear and concise manner that may be used to guide the initial nursing assessment of patients presenting to the ED, performed after triage. While HIRAID has a strong theoretical foundation, supported by expert opinion and current research evidence, the impact of the structured approach to assessment on clinical performance and patient care remains unknown. The action component of the Knowledge to Action Cycle describes how newly devised tools must be tested prior to implementation to determine the validity of the tool and usefulness in the clinical setting.¹¹ Evaluation of HIRAID is required to determine if the HIRAID approach to nursing assessment enhances the provision of safe patient care in the ED. An interactive education workshop has been developed to teach the components and application of HIRAID and is currently being evaluated in the Australian clinical (simulated) setting, with the financial support of the NSW Emergency Care Institute.⁷⁵ The emergency nursing assessment process is universal, and the simple, generic, evidence informed nature of HIRAID will enable international implementation.

Conclusion

The re-developed emergency nursing assessment framework 'HIRAID' is evidence-informed providing ED nurses with an organised approach to the comprehensive assessment of patients in the ED, performed after triage. Comprising of seven components of assessment: *History*;

Identify Red flags; Assessment; Interventions; Diagnostics; reassessment; and communication, HIRAID encapsulates the complex and continuous process of nursing assessment in the ED, commencing when the nurse first assesses the patient after triage extending through till despatch. HIRAID holds the potential to enhance the quality of ED nursing assessment worldwide. Evaluation of HIRAID is required to determine if the HIRAID approach to nursing assessment enhances the quality and provision of safe patient care in the ED.

Authorship

BM conducted literature review, led re-development of assessment framework and manuscript writing. KC identified need to re-develop assessment framework, contributed to assessment framework re-development and manuscript writing. MM and LS contributed to assessment framework re-development. TB contributed to manuscript writing.

Provenance and conflicts of interest

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