

## Supplementary Material

### **Exploring interdisciplinary communication pathways for escalating pre-medical emergency team deterioration: a mixed-methods study**

*Stephanie K. Sprogis*<sup>A,\*</sup> (RN, BN, MNursPrac, PhD, Research Fellow), *Judy Currey*<sup>A</sup> (RN, BN, BN(Hons), GCertHE, GCertSc (App Stats), PhD, Professor of Nursing), *Daryl Jones*<sup>B,C,D</sup> (BSc(Hons), MBBS, FRACP, FCICM, MD, PhD, Intensive Care Specialist, Professor, Adjunct Professor) and *Julie Considine*<sup>A,E</sup> (RN, RM, BN, GradDipNurs(Acute Care), MNurs, GCertHE, PhD, Chair in Nursing (Eastern Health); Professor of Nursing)

<sup>A</sup>School of Nursing and Midwifery & Centre for Quality and Patient Safety Research in the Institute for Health Transformation, Deakin University, 1 Gheringhap Street, Geelong, Vic. 3220, Australia

<sup>B</sup>Department of Intensive Care, Austin Hospital, 145 Studley Road, Heidelberg, Vic. 3084, Australia

<sup>C</sup>School of Public Health and Preventive Medicine, Monash University, 533 St Kilda Road, Melbourne, Vic. 3004, Australia

<sup>D</sup>Department of Surgery, University of Melbourne, Parkville, Vic. 3010, Australia

<sup>E</sup>Centre for Quality and Patient Safety Research – Eastern Health Partnership, 2/5 Arnold Street, Box Hill, Vic. 3128, Australia

\*Correspondence to: Email: [stephanie.sprogis@research.deakin.edu.au](mailto:stephanie.sprogis@research.deakin.edu.au)

Supplementary File 1: Observation Guide [One tool per patient assessment observed]

Clinician ID:    Clinician ID:    Clinician ID:    Clinician ID:    Patient ID:

Date / time of observation period:  /  /   :  :  -  :  :

Date / time of patient assessment:  /  /   :  :  -  :  :

Nursing shift type: ☐ AM ☐ PM ☐ ND

Location: ☐ Bedside ☐ Other: .....

Action / event	Yes	No	N/A	Comments
<b>UCR pathway</b>				
<b>Patient fulfils standard UCR activation criteria</b> (select all that apply)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div> <input type="checkbox"/> RR &gt;24 breaths/min  <input type="checkbox"/> RR &lt;10 breaths/min  <input type="checkbox"/> SpO<sub>2</sub> ≤94% with supplemental O<sub>2</sub>  <input type="checkbox"/> SpO<sub>2</sub> ≤94% without supplemental O<sub>2</sub>  <input type="checkbox"/> SBP &gt;180mmHg  <input type="checkbox"/> SBP &lt;100mmHg  <input type="checkbox"/> HR &gt;100 beats/min  <input type="checkbox"/> HR &lt;50 beats/min  <input type="checkbox"/> Temp ≥38°C </div> <div> <input type="checkbox"/> Temp ≤35.5°C  <input type="checkbox"/> Unrelenting SOB  <input type="checkbox"/> Any change to conscious / mental state  <input type="checkbox"/> New oliguria  <input type="checkbox"/> Increased / unexpected fluid / blood loss  <input type="checkbox"/> Clinician concern  <input type="checkbox"/> Other: .....  <input type="checkbox"/> Unable to tell from observation </div>
<b>Patient fulfils modified UCR activation criteria</b> (select all that apply)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div> <input type="checkbox"/> High RR  <input type="checkbox"/> Low RR  <input type="checkbox"/> Low SpO<sub>2</sub> with supplemental oxygen  <input type="checkbox"/> Low SpO<sub>2</sub> without supplemental oxygen  <input type="checkbox"/> High SBP  <input type="checkbox"/> Low SBP  <input type="checkbox"/> High HR  <input type="checkbox"/> Low HR  <input type="checkbox"/> High temp  <input type="checkbox"/> Low temp </div> <div> <input type="checkbox"/> Any change to conscious / mental state  <input type="checkbox"/> New oliguria  <input type="checkbox"/> Increased / unexpected fluid / blood loss  <input type="checkbox"/> Other: .....  <input type="checkbox"/> Unable to tell from observation </div>
<b>Immediate nurse-directed intervention/s</b> (prior to UCR call; select all that apply)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<div> <input type="checkbox"/> Reassessed vital sign/s  <input type="checkbox"/> Neurological observations  <input type="checkbox"/> Neurovascular assessment  <input type="checkbox"/> Chest auscultated  <input type="checkbox"/> DB&amp;C encouraged  <input type="checkbox"/> Tracheal suction  <input type="checkbox"/> Applied supplemental oxygen  <input type="checkbox"/> Increased supplemental oxygen  <input type="checkbox"/> Decreased supplemental oxygen </div> <div> <input type="checkbox"/> Sat patient up  <input type="checkbox"/> Lay patient flat  <input type="checkbox"/> Raised patient's legs  <input type="checkbox"/> Encouraged oral fluids  <input type="checkbox"/> Wound assessment  <input type="checkbox"/> Abdominal assessment  <input type="checkbox"/> Administered another prn medication: .....  <input type="checkbox"/> ECG </div>

Action / event	Yes	No	N/A	Comments
				<input type="checkbox"/> Removed supplemental oxygen <input type="checkbox"/> Nebulised medication <input type="checkbox"/> Patient education <input type="checkbox"/> Increased rate/dose of an IV infusion <input type="checkbox"/> Administered analgesia <input type="checkbox"/> Administered anti-emetic <input type="checkbox"/> Reassurance <input type="checkbox"/> Sought more information by questioning the patient <input type="checkbox"/> Consulted colleague: ..... <input type="checkbox"/> Other:.....
<b>Involvement of allied health clinician in assessment of patient</b> ( <i>assessments that occur any time prior to UCR call</i> )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time of assessment by allied health clinician: □□ : □□ Type of allied health clinician involved: <input type="checkbox"/> Pharmacist <input type="checkbox"/> Physiotherapist <input type="checkbox"/> Occupational therapist <input type="checkbox"/> Speech pathologist <input type="checkbox"/> Psychologist <input type="checkbox"/> Dietician <input type="checkbox"/> Social worker <input type="checkbox"/> Aboriginal and Torres Strait Islander Health Practitioner <input type="checkbox"/> Podiatrist <input type="checkbox"/> Other – please specify: ..... Type of assessment performed:
<b>Nurse in charge of shift / ANUM informed that patient fulfils UCR activation criteria</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time: □□ : □□
<b>Senior nurse performs a review</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time of senior nurse review: □□ : □□ Designation of senior RN: <input type="checkbox"/> RN <input type="checkbox"/> CNS <input type="checkbox"/> Nurse Educator/Clinical Support Nurse <input type="checkbox"/> ANUM <input type="checkbox"/> Manager <input type="checkbox"/> Other: .....
<b>Bedside nurse pages admitting team</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time page sent: □□ : □□ Escalated to: <input type="checkbox"/> Fellow

Action / event	Yes	No	N/A	Comments
				<input type="checkbox"/> Intern <input type="checkbox"/> Resident <input type="checkbox"/> Registrar <input type="checkbox"/> Senior Registrar <input type="checkbox"/> Consultant <input type="checkbox"/> Other: ..... <input type="checkbox"/> Unable to tell from observation
Bedside nurse collects UCR phone after paging admitting team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
UCR phone is attended at all times after UCR call is made	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Nurse in charge of shift / ANUM pages admitting team	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time page sent: <input type="checkbox"/> <input type="checkbox"/> : <input type="checkbox"/> <input type="checkbox"/> Escalated to: <input type="checkbox"/> Intern <input type="checkbox"/> Resident <input type="checkbox"/> Registrar <input type="checkbox"/> Senior Registrar <input type="checkbox"/> Fellow <input type="checkbox"/> Consultant <input type="checkbox"/> Other: ..... <input type="checkbox"/> Unable to tell from observation
Nurse in charge of shift / ANUM requests response to UCR call using ANUM phone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Documentation on UCR record (EMR/Cerner)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Unable to tell from observation
Nurse prepares ISBAR handover	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Unable to tell from observation
Nurse verbally offers provisional diagnosis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Unable to tell from observation
Vital sign/s measured while awaiting UCR (additional fields to be added if necessary)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time of measurement: <input type="checkbox"/> <input type="checkbox"/> : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> RR <input type="checkbox"/> SpO <sub>2</sub> <input type="checkbox"/> HR <input type="checkbox"/> BP <input type="checkbox"/> Temperature <input type="checkbox"/> Pain <input type="checkbox"/> Conscious state Time of measurement: <input type="checkbox"/> <input type="checkbox"/> : <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> RR <input type="checkbox"/> SpO <sub>2</sub> <input type="checkbox"/> HR <input type="checkbox"/> BP <input type="checkbox"/> Temperature <input type="checkbox"/> Pain <input type="checkbox"/> Conscious state
Phone consult	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time of phone consult: <input type="checkbox"/> <input type="checkbox"/> : <input type="checkbox"/> <input type="checkbox"/> Conducted by: <input type="checkbox"/> Intern <input type="checkbox"/> Resident <input type="checkbox"/> Registrar <input type="checkbox"/> Senior Registrar <input type="checkbox"/> Fellow <input type="checkbox"/> Consultant <input type="checkbox"/> Other: ..... <input type="checkbox"/> Unable to tell from observation

Action / event	Yes	No	N/A	Comments
<b>ISBAR handover to doctor</b> ( <i>by phone or in person</i> )	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Identify <input type="checkbox"/> Situation <input type="checkbox"/> Background <input type="checkbox"/> Assessment <input type="checkbox"/> Recommendation/Request
<b>UCR call attended in person</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time of UCR call: <input type="text"/> : <input type="text"/> Total number of clinicians present: <input type="text"/> Attended by: <input type="checkbox"/> Intern <input type="checkbox"/> Fellow <input type="checkbox"/> Resident <input type="checkbox"/> Consultant <input type="checkbox"/> Registrar <input type="checkbox"/> Other: ..... <input type="checkbox"/> Senior Registrar
<b>Responding doctor assesses patient</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Responding doctor provides provisional diagnosis</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Verbal <input type="checkbox"/> Written
<b>Responding doctor provides action plan</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Verbal <input type="checkbox"/> Written
<b>Involvement of allied health clinician in response to patient</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time of response by allied health clinician: <input type="text"/> : <input type="text"/>  Type of allied health clinician involved: <input type="checkbox"/> Pharmacist <input type="checkbox"/> Physiotherapist <input type="checkbox"/> Occupational therapist <input type="checkbox"/> Speech pathologist <input type="checkbox"/> Psychologist <input type="checkbox"/> Dietician <input type="checkbox"/> Social worker <input type="checkbox"/> Aboriginal and Torres Strait Islander Health Practitioner <input type="checkbox"/> Podiatrist <input type="checkbox"/> Other – please specify: .....  Type of response:
<b>Doctor's response is documented is documented by the bedside nurse or</b>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Documented by: <input type="checkbox"/> Nurse

Action / event	Yes	No	N/A	Comments
doctor				<input type="checkbox"/> Doctor <input type="checkbox"/> Both nurse and doctor <input type="checkbox"/> Unable to tell from observation
UCR activation criteria are modified post review	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If yes, modified by: <div style="display: flex; justify-content: space-between;"> <div> <input type="checkbox"/> Intern  <input type="checkbox"/> Resident  <input type="checkbox"/> Registrar  <input type="checkbox"/> Senior Registrar               </div> <div> <input type="checkbox"/> Fellow  <input type="checkbox"/> Consultant  <input type="checkbox"/> Other: .....  <input type="checkbox"/> Unable to tell from observation               </div> </div>
Nurse documents in clinical notes post UCR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Unable to tell from observation
Planned frequency of vital signs is altered	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Unable to tell from observation
Nurse informs nurse in charge of shift / ANUM of the outcome of the UCR call	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
If no response to activation of UCR, escalated further	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Escalated by: <input type="checkbox"/> Bedside nurse <input type="checkbox"/> Nurse in charge / ANUM <input type="checkbox"/> Another senior nurse Escalated to: <input type="checkbox"/> Registrar      Time: <input type="text"/> : <input type="text"/> <input type="checkbox"/> Consultant      Time: <input type="text"/> : <input type="text"/> <input type="checkbox"/> Head of unit      Time: <input type="text"/> : <input type="text"/> <input type="checkbox"/> Other: .....      Time: <input type="text"/> : <input type="text"/>
MET call is made before the UCR call is attended	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Possible factors influencing clinician use of UCR during the observation period (to be clarified in interviews)				
Patient acuity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Patient resuscitation status	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Workload	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Staffing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Action / event	Yes	No	N/A	Comments
Equipment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Clinician knowledge or experience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

*Note.* UCR=Urgent Clinical Review. The pre-MET tier was locally referred to as UCR. This research was a component of a larger study of clinicians' use of the pre-MET tier; thus, only selected variables from this observation guide relating to interdisciplinary communication pathways are reported in the manuscript.

# Exploring interdisciplinary communication pathways for escalating pre-medical emergency team deterioration: A mixed-methods study

## Supplementary File 2: Interview Guide

1. I noticed that you [*insert UCR-related action e.g., elevated the patient's feet, paged the doctor etc*]. Could you tell me more about what was happening there?
  - a. Probe: What prompted you to do that?
  - b. Probe: Could you tell me more about your thinking there?
  - c. Probe: What was going through your mind?
2. Did the process for getting help for your patient proceed / play out as you expected?
  - a. Probe: Why or why not?
3. In your experience, is this situation representative of how UCR normally works on this ward?
  - a. Probe: Why or why not?
  - b. Probe: How does it normally work?
  - c. Probe: How well do you think UCR works on this ward?
4. What makes UCR work well / not work well?
  - a. Probe: What do you think needs to change to make UCR work better?
  - b. Probe: Do you encounter any problems with resources on this ward (e.g., human, equipment related)? / How do you think those issues influence UCR?
5. How (if at all) has UCR supported you to improve your ability to recognise and respond to deteriorating patients?

*Note.* UCR=Urgent Clinical Review. The pre-MET tier was locally referred to as UCR. Specific questions and probes were determined by nature of the pre-MET/UCR event that was observed. This research was a component of a larger study of clinicians' use of the pre-MET tier. Data pertaining to clinicians' use and perceptions of interdisciplinary communication pathways and specific communication methods (e.g., alphanumeric pagers) were collected through questions 1 to 4.