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# Paediatric early warning system (PEWS) – escalation mapping tool

The four paediatric vital signs charts (PVSCs) and PEW score together identify levels of deterioration, which trigger a graded response based on the degree of that deterioration. Graded response systems may involve calling the senior nurse and/or the team doctors for low or medium levels of abnormality, or a rapid response provider for high levels of abnormality. Response processes will vary depending on the local context of your hospital.

Every hospital needs to define and develop a response to each level of physiological abnormality that triggers an escalation of care. To support your team in this work, we have produced a template (Appendix 1), adapted from the tool used by the adult and maternity patient deterioration programme (Figure 1). It offers a structured approach to identifying who will respond and what actions their response should include. You may need to repeat the exercise for different clinical areas where tamariki receive care – for example, the paediatric ward may need to have a different escalation pathway from the emergency department, if there are different staff involved in responding in these areas. If you have more than one hospital, then each hospital site will need to have an escalation pathway that reflects the available resources.

Carry out the escalation mapping exercise for each level of physiological abnormality in your escalation protocol. Developing your escalation process should involve multidisciplinary input. You should also consider what related policy and guidance you need to develop, review or update to support the process (eg, guidance around clinical documentation, referral, handover and communication). Figure 1 illustrates the overall escalation mapping process. Follow the steps in the template to help you to identify responses that are appropriate for your facilities. For a worked example, see Figure 2.

All clinicians will need education in how to use your PEWS and in the essential clinical skills and capabilities for recognising and managing acute physiological deterioration. District PEWS implementation project teams will have an education package available to increase capability using PEWS. Consider existing courses designed to teach essential clinical skills for managing deterioration, such as [Advanced Paediatric Life Support](http://apls.org.nz/).

Responders need specific education to give them the clinical and non-technical skills they need to manage acute deterioration and understand their responsibilities relating to communication and documentation. Such education is particularly important for non-tertiary responders who may not have critical care experience (eg, duty nurse managers who work as responders in small hospitals or patient-at-risk nurses).

**Figure 1: Escalation mapping process**

**Consider what
resources are needed**

**Consider additional training needs for responders**

**Summarise the final agreed response to be included in the escalation protocol. Repeat process for each level of abnormality.**

Determine which clinicians have the necessary knowledge and skills to respond and who is available to respond at different times of day and days of week

Decide how
the response system
will operate

Decide on the
responsibilities of
responding clinicians

Decide
what knowledge and
skills might be required to respond to
the level of abnormality

**Identify what level of abnormality
this mapping exercise relates to**

This worked example below illustrates how to work through the process of planning appropriate responses to each level of physiological abnormality. The content may not be relevant in every context as hospitals of different sizes will have different resources available.

**Figure 2: Worked example**

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| **Total PEW score 8+****(Note: Any vital sign in the Blue Zone triggers a rapid response call)** |
| **Skills and knowledge that health professionals may need to respond to EACH abnormality** |
| * Basic airway management
* Oxygen therapy
* Systematic physical assessment of the patient
* Auscultation of chest
* Blood gas and interpretation
* CXR and interpretation
* ECG and interpretation, treatment of dysrhythmia
* Urinary catheter insertion
 | * IV access
* Collection of pathology samples (UEC, FBC, blood cultures, U/A etc)
* Prescription and administration of drugs, IV fluids, blood and blood products
* Ordering of CT, USS and/or other tests
* Referral to other specialities
* Communication with tamariki, whānau or carer, and clinical team
* Access to pathways and guidelines
 |
| **Responding health professional(s) and number required*** On-call paediatric registrar
* RN caring for the tamariki
* Nurse in charge of ward
* Paediatric SMO
* ICU SMO
 | **Times these health professionals are available to respond*** On-call paediatric registrar 24/7
* RN caring for the tamariki 24/7
* Nurse in charge of the ward 24/7
* Paediatric SMO, immediately in hours, 20 mins out of hours
* ICU SMO, immediately in hours, ICU outreach registrar out of hours
 |
| **Responsibilities of attending health professionals**RN caring for the tamariki:* Request urgent registrar review
* Notify the nurse in charge
* Ensure a full set of observations completed to calculate full PEW score
* Collect a full set of observations at least every 30 mins and monitor total score

On-call paediatric registrar:* Notify the paediatric SMO
* Assess the patient and document a plan including required observations, time frame, and criteria for review

Nurse in charge of the ward:* Assist the RN caring for the patient
* Consider one-to-one nursing and reallocation of patient workloads
* Transfer the patient to children’s high care

Paediatric SMO* Reviews assessment and plan made by registrar
* Contacts ICU SMO if required

ICU SMO* Co-ordinates ICU admission if required
 |
| **What is the required timeframe for response given this level of abnormality?**Urgent, within minutes |
| **How will the health professional(s) be contacted?*** Paediatric registrar paged via the operator. Communication using ISBAR
* Nurse in charge of the ward via Vocera
* Paediatric SMO via the operator. Communication using ISBAR
* ICU SMO via the operator. Communication using ISBAR
 |
| **Other than those attending the patient, who else should be notified?**As above |
| **What are the alternative or back-up options for getting a response?** * Call the paediatric SMO directly if staff or whānau concern
* Call a clinical emergency
 |
| **Is the necessary equipment available in the clinical area to undertake this treatment?**☑ Yes 🞎 No → Consider purchasing equipment or develop process for bringing equipment to area |
| **Final agreed response to include in escalation protocol/policy and display on vital signs chart*** Request urgent registrar review
* Notify the nurse in charge
* Registrar to notify consultant
* Consider contacting ICU – this would usually be done by the paediatric SMO contacting the ICU SMO directly. In some situations, eg, the paediatrician being off-site and returning to the hospital, the paediatric registrar may contact the ICU outreach service.

Actions:* Ensure full set of observations completed to calculate full PEWscore
* Collect full set of observations at least every 30 minutes. Monitor total score
* Transfer the patient to children's high care
* Registrar to document a plan which includes required observations, time frame and criteria for review
* Recalculate the PEW score after interventions
* Ask: could it be sepsis? And follow the sepsis in children pathway
 |

Abbreviations used in the example above:

CT computerised tomography

CXR chest x-ray

ECG electrocardiogram

FBC full blood count

ICU intensive care unit

ISBAR introduction, situation, background, assessment, recommendation

IV intravenous

PEW paediatric early warning

RN registered nurse

SMO senior medical officer

U/A urine analysis

UEC urea electrolyte creatinine (blood test)

USS ultrasound scan

Appendix 1: PEWS escalation mapping tool template

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| **Total PEW score: 1‒3**  |
| **List skills and knowledge that health professionals may or will need to respond**  |
| **List responding health professional(s) and number required** | **List the times these health professionals are available to respond** |
| **Responsibilities of attending health professionals** |
| **What is the required timeframe for response given this level of abnormality?** |
| **How will the health professional(s) be contacted?** |
| **Other than those attending the patient, who else should be notified?** |
| **What are the alternative or back-up options for getting a response?**  |
| **Is the necessary equipment available in the clinical area to undertake this treatment?**🞎 Yes¨ No → Consider purchasing equipment or develop process for bringing equipment to area |
| **Final agreed response to include in escalation protocol/policy and display on vital signs chart** |

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| **Total PEW score: 4–5** |
| **List skills and knowledge that health professionals may or will need to respond**  |
| **List responding health professional(s) and number required** | **List the times these health professionals are available to respond**  |
| **Responsibilities of attending health professionals** |
| **What is the required timeframe for response given this level of abnormality?** |
| **How will the health professional(s) be contacted?** |
| **Other than those attending the tamariki, who else should be notified?** |
| **What are the alternative or back-up options for getting a response?**  |
| **Is the necessary equipment available in the clinical area to undertake this treatment?**🞎 Yes¨ No → Consider purchasing equipment or develop process for bringing equipment to area |
| **Final agreed response to include in escalation protocol/policy and display on vital signs chart** |

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| **Total PEW score: 6−7** |
| **List skills and knowledge that health professionals may or will need to respond**  |
| **List responding health professional(s) and number required** | **List the times these health professionals are available to respond**  |
| **Responsibilities of attending health professionals** |
| **What is the required timeframe for response given this level of abnormality?** |
| **How will the health professional(s) be contacted?** |
| **Other than those attending the patient, who else should be notified?** |
| **What are the alternative or back-up options for getting a response?**  |
| **Is the necessary equipment available in the clinical area to undertake this treatment?**🞎 Yes¨ No → Consider purchasing equipment or develop process for bringing equipment to area |
| **Final agreed response to include in escalation protocol/policy and display on vital signs chart** |

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| **Total PEW score: 8+** |
| **List skills and knowledge that health professionals may or will need to respond to EACH abnormality**  |
| **List responding health professional(s) and number required** | **List the times these health professionals are available to respond** |
| **Responsibilities of attending health professionals** |
| **What is the required timeframe for response given this level of abnormality?** |
| **How will the health professional(s) be contacted?** |
| **Other than those attending the patient, who else should be notified?** |
| **What are the alternative or back-up options for getting a response?**  |
| **Is the necessary equipment available in the clinical area to undertake this treatment?**🞎 Yes¨ No →Consider purchasing equipment or develop process for bringing equipment to area |
| **Final agreed response to include in escalation protocol/policy and display on vital signs chart** |

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| **Single parameter trigger in the blue zone actions** |
| **List skills and knowledge that health professionals may or will need to respond to EACH abnormality**  |
| **List responding health professional(s) and number required** | **List the times these health professionals are available to respond**  |
| **Responsibilities of attending health professionals** |
| **What is the required timeframe for response given this level of abnormality?** |
| **How will the health professional(s) be contacted?** |
| **Other than those attending the patient, who else should be notified?** |
| **What are the alternative or back-up options for getting a response?**  |
| **Is the necessary equipment available in the clinical area to undertake this treatment?**🞎 Yes¨ No → Consider purchasing equipment or develop process for bringing equipment to area |
| **Final agreed response to include in escalation protocol/policy and display on vital signs chart** |

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| This document was published by the Health Quality & Safety Commission in October 2022 for implementation. |

