ESCALATION Project: Testing and implementation of a uniform system for recognition and response to paediatric clinical deterioration in Western Australia

ESCALATION
RECOGNISING AND RESPONDING
TO PAEDIATRIC CLINICAL DETERIORATION IN WA

Project Report Phase 2

June 2021

This report was prepared by the Project team:

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Acknowledgements

The project team acknowledges the contribution and support from:

- CAHS Executive Director Medical Services
- ESCALATION Stakeholder group, Site Champions, Working Group, Educators group and PCH Chart development group
- ESCALATION Pilot Sites: Broome Health Campus and Perth Children's Hospital
- PCH Simulation team

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Executive Summary

The ESCALATION Project aimed to develop evidence based state-wide system for recognising and responding to clinical deterioration (RRCD) in WA paediatric settings inclusive of family participation and to evaluate the feasibility and factors necessary to ensure successful implementation. The objectives were:

1. To identify the evidence for core elements of an effective RRCD system
2. To understand contextual factors in WA health setting impacting on requirements for RRCD
3. To develop a set of age appropriate observation and response charts incorporating
4. evidence-based human factors principles, nurse concern, family concern that takes into consideration WA health settings requirements
5. To develop escalation of care plans that incorporate structured communication tailored to WA health setting requirements
6. To develop a uniform process for family involvement in escalation of care that meets the needs of WA families
7. To implement the RRCD system in a range of contexts in WA paediatric settings
8. To assess for feasibility and acceptability and evaluate the RRCD system
9. To understand key factors required for successful implementation

Project design, implementation and findings

The project was conducted using a mixed methods implementation design. In 2019 phase 1 involved development and initial pilot testing (4 – 12 weeks) of a proposed uniform ESCALATION System for a state-wide approach to the recognition and response to clinical deterioration in children. This report is on 2020 Phase 2 (Figure 1).

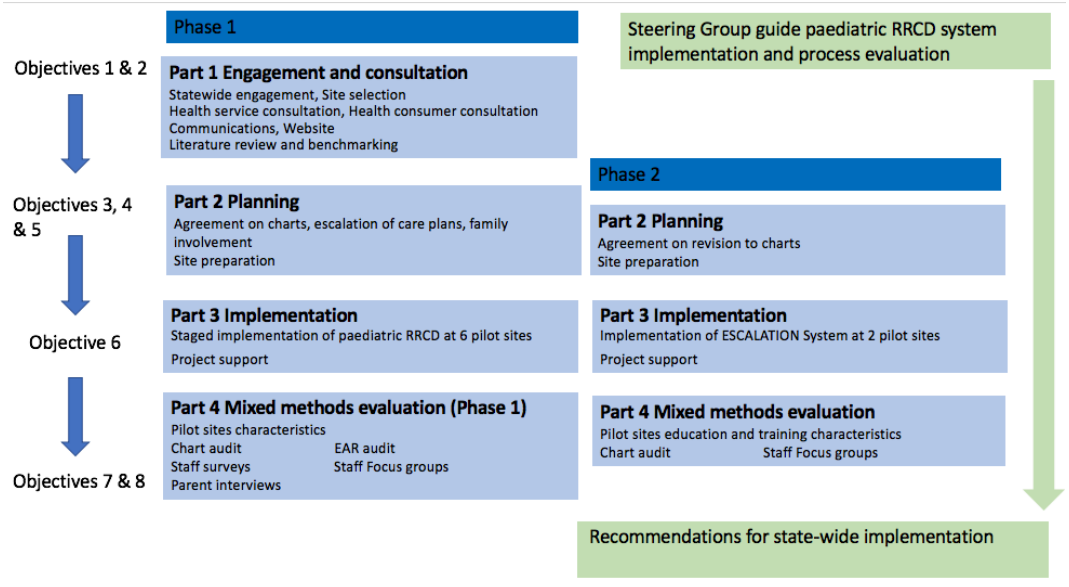

Figure 1. Phase 1 and 2 ESCALATION project design, methods and process

Phase 2 Planning

Phase 1 feedback and recommendations informed revision of charts and family posters and flyers. Sites were prepared to trial ESCALATION System v 2.0

Phase 2 Implementation

Two trial sites were Broome Health Campus and Perth Children's Hospital for testing ESCALATION System v 2.0 for six weeks.

Phase 2 Mixed methods evaluation

Mixed methods evaluation included data collection on pilot site characteristics, intervention delivery, chart audits and staff focus groups

Phase 2 Project Outcome

The project was successful in developing and trialling ESCALATION System v 2.0. It was well received with feedback to further refine for v3.0.

Recommendations

1. Revision and refinement to chart design and continued engagement with and input from stakeholders.
2. Hospital wide implementation of ESCALATION System v 3.0 at Perth Children's Hospital and Broome Hospital.
3. Dedicated staff development nurse role to provide education and support prior to and during implementation
4. Target >80% nurses and doctors receive education
5. Staff preparation needs to include active learning such as simulated practice, case reviews, real-time feedback, discussion.
6. Staged roll out to ensure each ward/department receives tailored support
7. Education and feedback to emphasise correct completion of graphical observations

Associate Professor Fenella Gill
For the ESCALATION Project Team
June 2021

ESCALATION project background

Failure to recognise and respond to clinical deterioration in a timely manner can result in serious adverse outcomes with devastating consequences, particularly in children. In WA, there is not a uniform approach to recognising and responding to acute deterioration in children and this may contribute in failure to recognise or respond in a timely manner to critical changes in a child's condition. The ESCALATION Project aimed to develop evidence based state-wide system for recognising and responding to clinical deterioration (RRCD) in WA paediatric settings inclusive of family participation and to evaluate the feasibility and factors necessary to ensure successful implementation.

The objectives were:

1. To identify the evidence for core elements of an effective RRCD system
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Phase 1 was completed in 2019 and involved development and initial pilot testing (4 – 12 weeks) of a proposed uniform ESCALATION System for a state-wide approach to the recognition and response to clinical deterioration in children. The system incorporated a track and trigger chart with a composite scoring system – the Paediatric Acute Response and Recognition Observation Tool (PARROT), integrated family involvement, a framework for escalation communication (iSoBAR NOW) and an escalation of care pathway. Evaluation at six pilot sites (Perth Children's, Fiona Stanley, Joondalup, Broome, Albany and Narrogin) indicated the approach was feasible and appropriate and provided direction to further refine the System.

Recommendations for refining the System to ESCALATION v2.0 took into consideration feedback provided by individual pilot sites, stakeholders and consumers at a group and individual level.

Phase 2 ESCALATION System v2.0

This report focuses on the Phase 2 development and testing of ESCALATION System v2.0 (Figure 1).

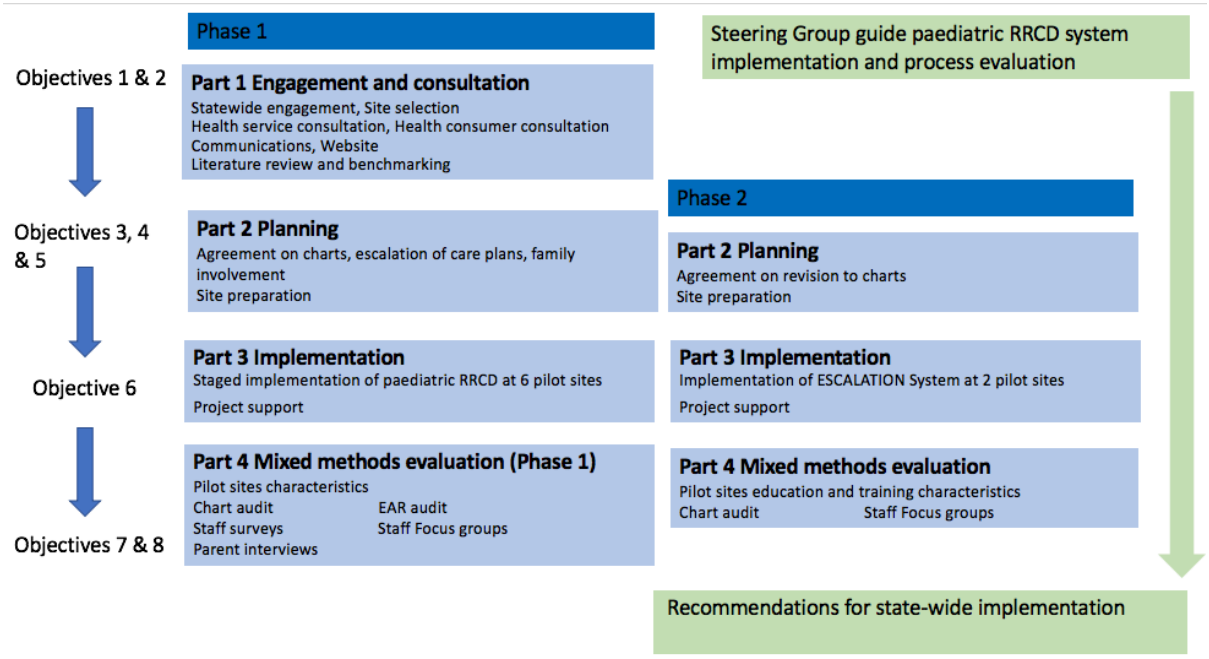

Figure 1. Phase 1 and phase 2 ESCALATION project design, methods and process

Planning

PARROT v2.0 development

Over four months (March to July 2020) 16 edits and revisions were made. The research team worked iteratively with the chart development working group/clinicians and with the graphic designer to incorporate the following changes:

- Improvements to formatting and layout throughout
- Frequency of observations removed (redundant)
- Signature key added
- Information on iSoBAR NOW moved from front page to back page
- Modifications moved to front page and number of modifications available reduced from three to two
- Key added for clinician and family concern variable
- Probe change added
- UMSS moved out of main chart area
- Weighting for pain score revised

- Escalation yes/no removed (redundant)
- Additional observations or comments box removed from chart area (redundant)
- Revision of age specific parameters

Pilot sites

Two sites, Perth Children's Hospital and Broome Health Campus tested ESCALATION System v2.0. At Perth Children's Hospital there were three departments; The Emergency Department and Ward 2A participated in the Phase 1 and Phase 2 trial and Ward 2b medical was a new clinical area added to Phase 2 to evaluate additional education and implementation strategies used to address inconsistencies in education, training and implementation. At Broome Health Campus, the Emergency Department and Paediatric Ward participated in Phase 1 and Phase 2 trial.

Implementation

A range of communication and engagement strategies were used to accommodate the multiple and geographically diverse locations of stakeholders. Email, telephone, video, telehealth, as well as in person (face to face) meetings were used. The website was a resource for communication with stakeholders and pilot sites and to disseminate information to the wider healthcare groups and consumers interested in the project. The website www.escalation.com.au was available from Feb 2019 and updates were posted monthly. The website also hosted the education resources such as presentations and videos.

Site	July	August	Sept	Oct	Nov
Broome		Implementation		Evaluation	
	Site Preparation	Education, Workshops & Support	Testing for 6 weeks	Chart Audits and Focus Groups	Report and recommendations
PCH		Implementation		Evaluation	
	Site Preparation	Education, Workshops & Support	Testing for 6 weeks	Chart Audits and Focus Groups	Report and recommendations

Figure 2. Phase 2 Implementation Timeline

Education and training for staff and site support were delivered using multiple strategies including; site champions' workshop, website resources, onsite and telehealth education and support, site specific information packages providing guidance and tools for implementation and data collection. The site champions' workshop had attendees (staff development nurses and nurse educators) from the two sites and included sessions on practice theory instruction, demonstration, videos, scenarios and simulated practice sessions. The train the trainer format was used to prepare site champions to deliver staff training at their own sites.

Evaluation

Phase 2 data were collected on pilot site characteristics, intervention delivery, chart audits and staff focus groups.

Pilot site characteristics

Both sites completed the six week trial from 14th September – 25th October 2020. The paediatric service activity during their respective pilot period was estimated based on Phase 1 trial data in 2019. The service activity level overall was higher than anticipated at PCH ED and lower than anticipated in all other trial areas (Table 1).

Table 1. Expected service activity and actual service activity

Site/ Department	Anticipated paediatric patient service activity*	Actual paediatric patient service activity	Trial period
PCH ED	3000 presentations	7752 presentations	6 weeks
PCH 2A	300 admissions	152 admissions	6 weeks
PCH 2B	150 admissions	71 admissions	6 weeks
Broome ED	1000 presentations	576 presentations	6 weeks
Broome ward	100 admissions	60 admissions	6 weeks

*Based on Phase 1 (2019) trial data

Intervention delivery

Education and training for staff and site support were delivered using multiple strategies including; site champions' workshop, website resources, onsite and telehealth education and support, site specific information packages providing guidance and tools for implementation and data collection. For the site champions' workshop a train the trainer format was used to prepare site champions to deliver staff training at their own sites. There were 7 attendees (staff development nurses and nurse educators) and content included practice theory instruction, demonstration, videos, scenarios and simulated practice sessions.

Prior to trial the aim was to have 80% of staff complete some education and training. At PCH 81 nursing and 49 junior medical staff received face to face training and 42 nurses watched a video. At Broome, 80% of nursing and medical staff received face to face education. Face to face training included debriefing of case studies, reviewing patient observations and real time feedback.

Chart audit

A total of 123 PARROTs were audited; 73 (59%) from Perth Children's Hospital and 50 (41%) from Broome Health Campus. Most (69, 56%) charts were for admitted patients. Compliance

with documentation was satisfactory for correct age chart, date and times recorded, correct completion of modifications (Table 2).

Compared to Phase 1 there were improvements to escalation of care in accordance with escalation plan and documentation of clinical interventions (Table 2). There were also more patients who had a complete set of observations recorded when triggered in comparison to Phase 1. However, rates of escalating care in accordance with the escalation pathway needs to be further improved and will be an important area to focus on in the implementation and education for the hospital wide roll out. Less frequent documentation of the early warning score was noted in v2.0 compared to v1.0. This will need to be addressed in the design, education and implementation of v3.0 to promote early warning score completion.

Table 2. Comparison of PARROT audits v2.0 and v1.0

	V2.0 (n=123)	V1.0 (n=249)
Correct age chart used	120 (98%)	242 (97%)
Date for observations recorded	101 (82%)	218 (88%)
Times for observations recorded	123 (100%)	241 (97%)
Nurse initials completed for each set of observations	74 (60%)	150 (60%)
Scoring system used Score added correctly	50 (41%) 45 (90%)	189 (76%) 161 (85%)
Modifications in use	2 (1.6%)	5 (2%)
Modifications correctly written	2 (100%)	3 (60%)
Number of triggers in the last 24 hours (mean)	0.85 (0-6)	0.85 (0-5)
All observations recorded for last trigger (if applicable)	35 (45%)	55 (39%)
Patient condition met criteria for escalation in the last 24hrs	53 (43%)	126 (51%)
Care escalated in accordance with escalation plan	18 (34%)	18 (14%)
Clinical intervention and escalation of care documented	18 (34%)	28 (11%)

In addition to the data collected in the formal audit questions, behaviours around chart completion were noted by auditors including issues with inconsistent completion of charts. Behaviours noted were not consistently joining the dots and creating a clear graphical trend, creating loops or tails rather than a linear graph and writing in graphical areas of the chart.

Staff focus groups

Feedback was sought from staff in all participating departments. The purpose of focus groups was to understand context, refinements and any further adaptions required and discuss key areas for effective implementation of the ESCALATION System. A total of 21 nurses participated in eight focus groups. Use of the claims, concerns and issues framework (as used in phase 1) enabled comparison and targeted feedback on the ESCALATION System (see Figure 3).

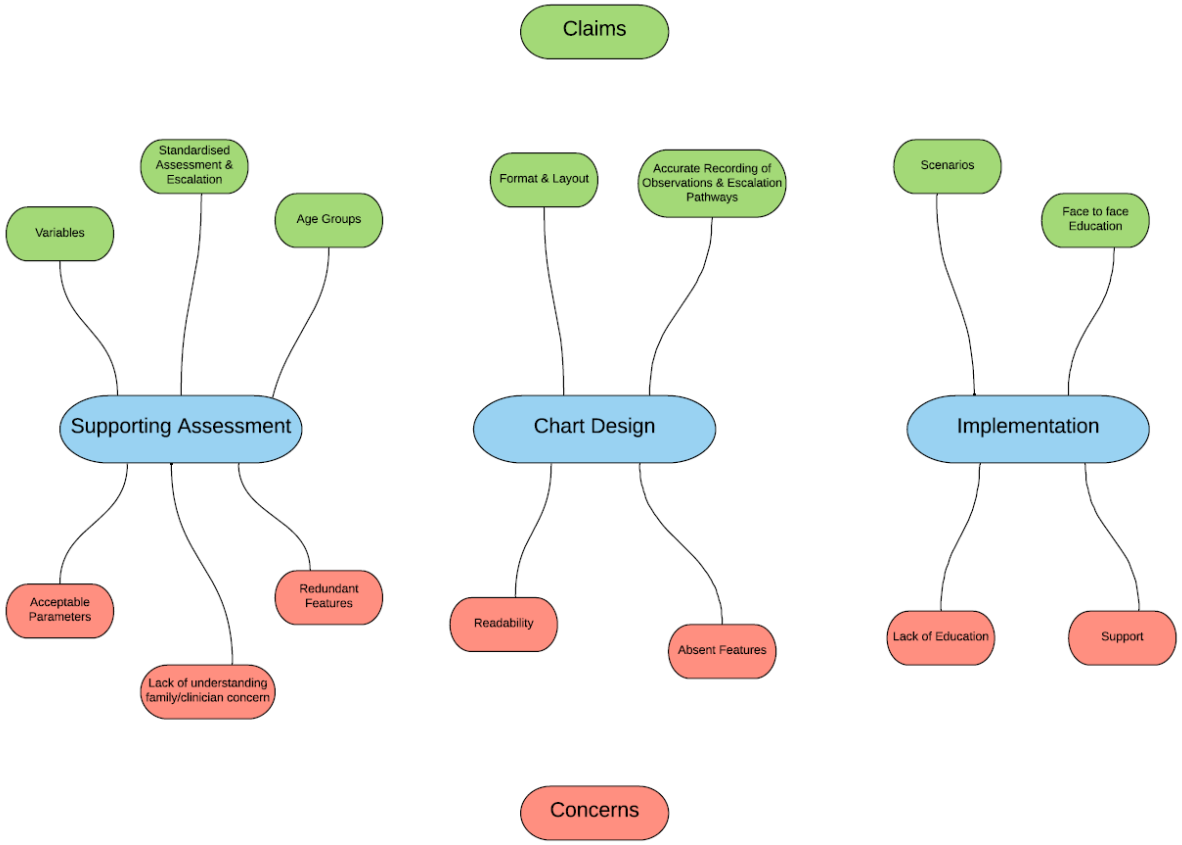

Figure 3. Phase 2 Focus group claims and concerns

Claims: Staff were positive about many features and those who had experience using v1.0 felt v2.0 was a substantial improvement. Favourable themes were identified as those supporting assessment, chart design itself and implementation of the ESCALATION System. The family and clinician concern variable was viewed positively and some nurse participants reported they felt this variable increased the responsiveness of doctors when they raised concerns. As in phase 1, participants continued to favour temperature being an unweighted variable and liked the consistent and standardised assessment of variables particularly the assessment of respiratory distress. The ability to easily score oxygen delivery for both L/min and FiO2 was a feature which participants valued. Some participants reported the parameters in use for variables were good overall and said there was less need to use modifications. The five age groups and visual identifiers for each chart remained popular and participants also liked the age appropriate elements for each chart such as pain scales and level of activity for babies <3 months.

For the chart design, the ABCDE format was considered to be logical and once participants became accustomed to this layout they found the order easy to follow. Staff liked having space to write numerical values as well as having graphical representation as they had in the previous version. Staff indicated a preference for face to face education and particularly liked having scenarios to work through and practice using the new charts.

Concerns: Some unfavourable features and areas of uncertainty were raised. In relation to supporting assessment some elements were considered as redundant; participants reported they were not familiar with the use of iSoBAR NOW. The signature key was not used. There were some features that participants wanted to add including Mean Arterial Pressure (MAP). Although participants felt the design had improved, they reported v2.0 PARROT still appeared too busy and the boxes and text were too small. The central capillary refill time variable did not stand out enough on the chart and could be easily missed. There was uncertainty about when numerical values should be written for observations. Some participants wanted more information and education around the clinician and family concern variable. There was feedback that some parameters and variables needed to be reviewed for example for the over 12 year old chart the parameters were too wide. The narrowing of acceptable limits was based of benchmarking and APLS guidelines. Some participants were concerned that there was no emergency level designated for the upper levels of respiratory rate and heart rate variables. Based on manager preference family posters were not displayed in the patient rooms of one ward which meant information on family involvement was not as accessible in this area. Feedback about the education video indicated participants felt it was too long.

Issues: Building on the discussion of favourable (claims) and unfavourable (concerns) aspects, staff identified areas for improvement, revision and ways to promote effective implementation. For the chart design participants wanted the lines for boxes to be finer and lighter, and for there to be more space generally. There was feedback that the number of modifications available should be increased from two to three. Participants wanted time for review in the escalation pathway bolded to make this information stand out.

There was a preference for in-person education which includes clinical scenarios and opportunities to practice using the new system. More education about clinician and family concern and clarification on when to write numerical values for observations were recommended. Participants requested visible support during implementation with dedicated staff available to provide support, answer questions and give guidance. Staff reported that the first two weeks of using the new system were the most challenging. The need for education specifically for medical staff was identified. Audits on the use of the system which include rewards and recognition for successful departments were also suggested.

<u>Feedback from the site champions</u>

The site champions reported the first two weeks were the most challenging to adapt to change and use of the new tools.

Key challenges included

- Engaging staff to escalate care in accordance with Early Warning Score Escalation Pathway
- Encouraging staff to use the scoring system (adding a total score, or deciding when to do a complete patient assessment to get a score)

- Engaging staff to involve the family and promote the use of Family and clinician concern variable
- Encouraging staff to correctly plot observations as linear graphs to ensure trends are clearly visible (noted in phase 1 and phase 2 chart audits that some staff did not complete the graph by joining the dots inconsistently or incorrectly which reduces the ability to detect trends

Sepsis Recognition

In 2020, in response to a case of delayed recognition of sepsis at PCH, the CAHS Executive Director Medical Services directed that a sepsis escalation pathway be developed for PCH. Although sepsis prompts and escalation of care pathway had been considered for ESCALATION v1.0 and v2.0, no stakeholder agreement had been previously reached. The new mandate provided the opportunity to incorporate sepsis recognition in ESCALATION v3.0

Key recommendations for ESCALATION System v3.0

- Change chart to portrait orientation
- Further decluttering
- Inclusion of a sepsis prompt and escalation pathway
- Increase available modifications to three
- Parameter revisions for aged charts 5-11 years and 12 plus (refined)
- Removal of signature key
- Ability to record MAP added

Key recommendations for hospital wide implementation

- Dedicated staff development nurse role to provide education and support leading up to and during implementation
- Education to be provided for a minimum of 80% of all staff prior to commencing implementation
- Staff preparation needs to include active learning such as simulated practice, case reviews, real-time feedback, discussion.
- Staged roll out to ensure each ward/department receives tailored support
- Education and feedback to emphasise correct completion of graphical observations