EE1 ORC5
FACT SHEET

# Why is it crucial to test any non-approved ORC modifications?

**"We want to make a modification to the ORCs that is not on the approved list. Why do we need to conduct empirical studies to test this modification?"**

Any modification to the Commission observation and response charts (ORCs) that is not on the approved list (see fact sheet EE1 ORC2) is potentially dangerous. This is because understanding and predicting the potential impact of design changes on the performance of those using the chart is not straightforward and the appropriate design choice may be counterintuitive.

Research evidence[1] indicates that even experienced clinicians cannot reliably identify which chart designs lead to the fewest errors. That is, relying solely on clinical judgement to determine chart design is likely to result in inappropriate design choices. Even making design decisions based on lists of human factors design rules[2] may be a problem as a particular guideline may not be appropriate in every context, and different design rules may conflict with one another.

To determine whether a design modification (or new overall chart design) is safe, there is no substitute for empirical evaluation, including behavioural simulation testing. Research indicates that such behavioural tests often yield counterintuitive findings.[1,3]

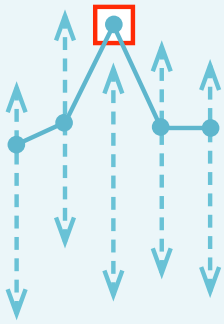
Advice on conducting behavioural/simulation testing is provided in Fact Sheet EE1 ORC6.

This fact sheet is one of a series that provides specific information about the process of selecting, implementing and using an observation and response chart. The other fact sheets in this series are:

- EE1 ORC1 Introducing an observation and response chart
- EE1 ORC2 Modifying the observation and response chart for local use
- EE1 ORC3 Potential practice changes associated with implementing an observation and response chart
- EE1 ORC4 Training clinicians to use the observation and response charts
- EE1 ORC6 How to run a behavioural study to test chart modifications

## Example 1: A survey of experienced clinicians indicated that most preferred heart rate and blood pressure readings to be superimposed on the same chart area

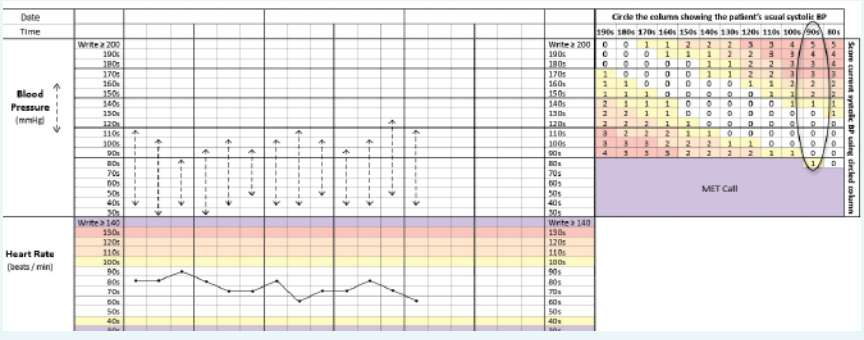
This allows the use of a cue known as the 'seagull sign', which occurs when the heart rate reading is plotted above systolic blood pressure, and indicates that the patient may be deteriorating.



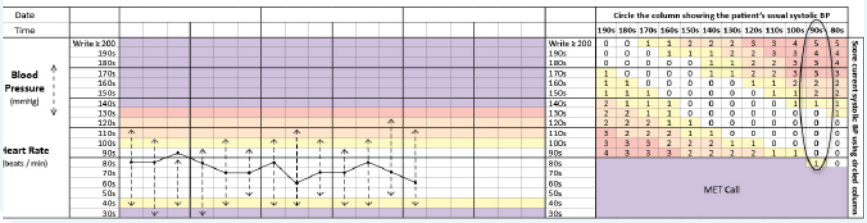
The benefit of separating heart rate and blood pressure relative to the benefit of being able to use the seagull sign was tested in a behavioural experiment. When asked to identify abnormal observations on charts with track and trigger systems, participants made more errors and had longer decision times if heart rate and blood pressure were superimposed compared to when they were separated (see the chart illlustrations at left).

This result held even when patient cases where a seagull sign was potentially available were viewed by seagull sign trained participants who reported that they were using the seagull sign in practice. That is, in this case, the chart design preferences of experienced clinicians were not supported by the evidence.

Blood pressure and heart rate presented on seperate chart areas (no seagull sign):




Blood pressure and heart rate presented on the same chart area (seagull sign possible):



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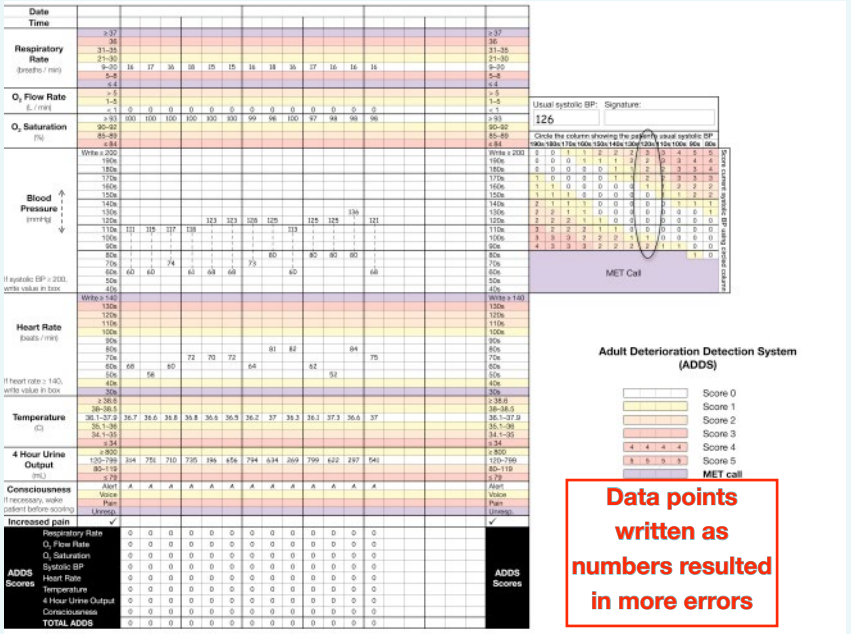
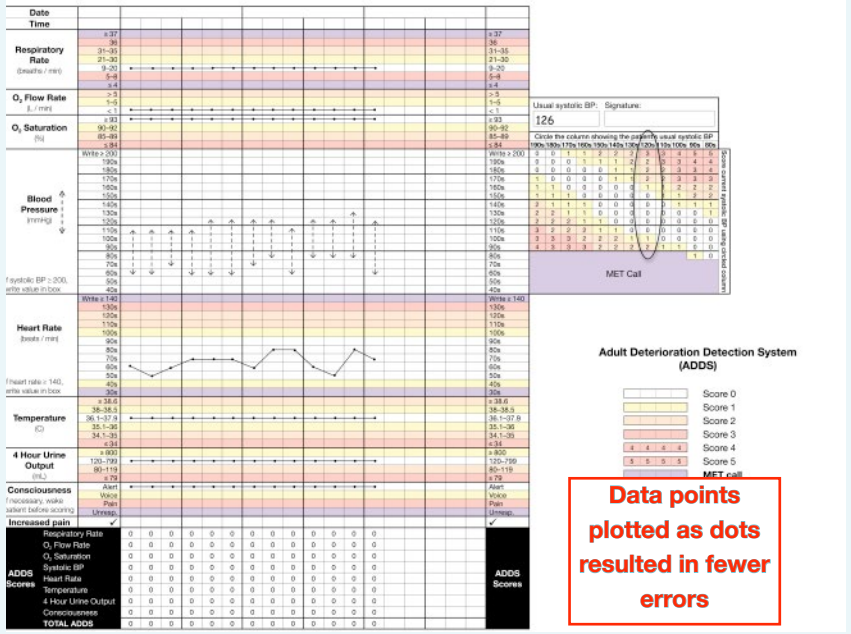
## Example 2: Graphing data

Many clinicians prefer writing numbers onto charts to represent data points rather than just plotting dots.[3] Objective behavioural research[4] indicated that this preference was actually associated with more errors and slower decision times.




Untested modifications to an ORC (especially modifications that violate the human factors design recommendations) may decrease its effectiveness as a tool for detecting clinical deterioration. If you do not have sufficient resources to conduct this type of testing then you should not modify an ORC beyond what is allowed.

## References


1. Preece, MHW, Hill, A, Horswill, MS, Karamatic, R, & Watson, MO (in press). Designing observation charts to optimize the detection of patient deterioration: Reliance on the subjective preferences of healthcare professionals is not enough. Australian Critical Care. Accepted 31st Jan 2012.
2. Preece, M, Horswill, M, Hill, A, Karamatic, R, Hewett, D & Watson, M (2009). Heuristic analysis of 25 Australian and New Zealand adult general observation charts. Sydney, Australia: Australian Commission on Safety and Quality in Health Care.
3. Elliott D, McKinley S, Perry L, Duffield C, Ledema R, Gallagher R, Fry M, Roche M, Allen E. 2011. Observation and Response Charts Usability Testing Report. University of Technology, Sydney. Available at: http://www.safetyandquality.gov.au/wp-content/uploads/2012/02/ORC-Usability-Testing-Phase-Report-final-Nov-2011.pdf
4. Christofidis MJ, Horswill MS, Hill A, Watson MO. Human factors design and observation charts. 7th International Conference on Rapid Response Systems and Medical Emergency Teams. Sydney, 2012.



This fact sheet was prepared by Mark Horswill, Andrew Hill, Melany Christofidis and Marcus Watson of The University of Queensland: chartdesign@psy.uq.edu.au


## Further information

Further information about implementing recognition and response systems can be found in the Australian Commission on Safety and Quality in Health Care publication *A Guide to Implementation of the National Consensus Statement: Essential Elements for Recognising and Responding to Clinical Deterioration* (2011).

This can be downloaded from: www.safetyandquality.gov.au


Australian Commission on Safety and Quality in Health Care

GPO Box 5480

Sydney NSW 2001

Telephone: (02) 91263600

Email: mail@safetyandquality.gov.au