

User acceptance and pilot testing of the observation and response charts (ORCs) in practice highlighted a number of clinical issues that need to be considered when introducing the ORCs. In this fact sheet, those areas of the charts that were a common source of concern are discussed in detail.

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 ORC 1 Introducing an observation and response chart
- EE1 ORC2 Modifying the observation and response chart for local use
- EE1 ORC4 Training clinicians to use the observation and response charts
- EE1 ORC5 Why is it crucial to test any non-approved ORC modifications?
- EE1 ORC6 How to run a behavioural study to test chart modifications



The 'seagull sign'

If blood pressure and heart rate are documented on the same graph using the same scale, then any time point when the heart rate is plotted above the systolic blood pressure provides a cue that the patient may be deteriorating.¹ This cue is known as the 'seagull sign' and is commonly used by some groups of clinicians.



The seagull sign cannot be visualised on the ORCs because heart rate and blood pressure are plotted on separate graphs. This is in order to avoid the visual clutter associated with overlapping plots. The seagull sign also becomes redundant because of the integrated track and trigger system. Nonetheless, the absence of a potential seagull sign has been a source of concern for some clinicians.

A human factors simulation experiment was conducted to determine whether the advantage of separating heart rate and blood pressure plots outweighed the advantage of being able to use the seagull sign cue.² It was found that health professionals with experience in using the seagull sign, who were tasked with identifying abnormal observations on a series of charts, made more errors and had longer decision times when blood pressure and heart rate were plotted together compared with when they were separated. This even held true when only cases where a seagull sign was potentially available were considered (on charts with integrated track and trigger systems). That is, objective performance data indicates that maintaining the seagull sign by using overlapping plots may actually increase patient risk.

Documenting blood pressure

Blood pressure has traditionally been recorded with arrow heads connected by a line. In practice it is common for blood pressure to be recorded with the fins of the arrow head pointing either inwards or outwards.

There is no evidence that one method is more accurate or safer than the other in clinical practice but it is very important that one method is used consistently. The Muller-Lyer illusion (see Figure) describes the phenomenon where lines of the same length are perceived differently depending on whether there are fins attached and whether those fins point inwards or outwards.^{3,4} If both outward and inward pointing fins are used to represent blood pressure readings then data trends are more difficult to interpret, assessment of systolic to diastolic range may be inappropriate, and clinical deterioration may be more difficult to detect.



Figure: The Muller-Lyer illusion – all of the lines above are of exactly the same length but are perceived differently when inward (top) or outward (centre) pointing fins protrude from the ends

When selecting a chart for use, organisations should ensure that the symbol used to document blood pressure is consistently applied across all clinical forms used in the facility.

Assessment of consciousness

Patients who are deteriorating clinically in acute health facilities may demonstrate alterations in level of consciousness from a variety of causes such as drug induced sedation, coma, infection, drug and alcohol withdrawal, or shock. There is not yet any consensus on an optimal tool for the assessment of level of consciousness in a general population of patients who could be deteriorating from any cause.

The Alert/Voice/Pain/Unresponsive (AVPU) scale has been used on the ORCs because it is simple, readily understood, in common use and has demonstrated validity in comparisons with the Glasgow Coma Scale.^{5,6} The AVPU scale can be substituted for another simple consciousness scale if a superior validated and user-friendly alternative can be identified. Scales such as the Glasgow Coma Score are too complex to be included on the charts and should be documented on an additional chart if they are required. Any decision to substitute an alternative scale should be carefully considered by appropriate clinical experts and take into account the fundamental human factors principles that underpin the design of the charts.

It is important that:

- The labels for any substitute scale that is used are easily understood and do not require chart users to refer elsewhere to understand what is required.
- Full words are used, as abbreviations run the risk of being misunderstood or not recognised (especially by less experienced or relief staff). In the research undertaken to develop the ORCs, a surprising proportion of experienced health professionals misinterpreted some of the common abbreviations used on existing observation charts.
- The unit of measurement (if appropriate) should be included in the label area. This acts as an extra prompt for users' recognition of the variable.

Health services should also reach agreement and indicate in their observation and monitoring policies whether it is expected that patients are to be routinely woken to assess level of consciousness. If patients are not woken, then level of consciousness cannot be assessed and should not be recorded on the chart.

Graphing observations

The instructions for use of the charts indicate that observations must be graphed with dots in the centre of each row, with dots at adjacent time points linked by straight lines. Graphing observations may involve a significant practice change for both doctors and nurses.

The reason that the ORCs use this method of data presentation is that graphing observations improves the detection of clinically significant trends.^{7,8} There is also evidence that the numerical values obtained with many vital sign measurements are frequently imprecise or inaccurate, even when the correct procedures have been followed.⁸⁻¹⁰ Furthermore, when numerical values are used instead of dots or blood pressure arrows this has been found to lead to significantly higher error rates and longer decision times (presumably as a result of the extra visual clutter involved).² In this context, the Commission considers that the safety benefits of graphing observations using dots and blood pressure arrows outweigh the difficulties of embedding practice change.

During the pilot testing of the ORCs, strong feedback was received from chart users that they would nonetheless prefer to write precise numerical values than graph observations. In response to clinician concerns, changes have been made to the ORCs to decrease the width of the numerical range signified by rows within each observation parameter. This may allow improved tracking of vital sign trends even within the white ('normal') zones of the charts while maintaining the safety benefits of graphed observations.

References

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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 (2011).

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

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