The cognitive processes of doctors and nurses in the interpretation of physiological monitoring data in the neonate. Neil McIntosh, Andrew J. Lyon, Jan Reiss, Julie Clare Becher, Robert Logie, Ken Gilhooley, Eugenio Alberdi, Jim Hunter, 

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Objective: The study aimed to determine the ability of medical and nursing staff of different grades to recognise physiological, pathological and artifactual conditions in multiple time series of trended neonatal physiological information.

Background: Trended physiological data display should give early warning of impending problem. This form of data display is uncommon and the patterns of physiological abnormality and artifact in such multiple time series data may not be appreciated. This may be the reason for a previous randomised controlled trial of such display failing show improved patient outcome (Cunningham et al., Crit Care Med 1998,26,2053–2060).

Design/Methods: Off-ward simulations of real multiple time series neonatal physiological data were used to test the cognitive processes by which staff at different grades detect and assess data. The study used a computerised cot monitoring system (MARY) present for 10 years in a tertiary referral NICU. Senior and junior medical and senior nursing staff (n = 7, 8, 10) were given unlimited time to comment and demonstrate (recorded on video) on fourteen 3 hour traces of physiological data collected at 1 herz of heart rate, mean BP, transcutaneous oxygen and carbon dioxide and differential temperature (toe/core gap) displayed sequentially in 7 minute sections. 12 traces displayed physiological responses to medications, pathological abnormality or artifact and 2 were normal. Other information that would have been available at the time was given on request. The 2 hour compressed trace was presented at the end of the session.

Results: Protocol segmentation yielded 11,921; 6610; and 9463 statements from the 7 senior, 8 junior physicians and 10 nurses respectively. Junior doctors and nurses tended to generate a larger proportion of simple pattern descriptions than senior doctors while the latter noted more relationships amongst the patterns and generated more hypotheses about why the patterns existed. Senior doctors and nurses noted more artifact than did junior doctors. Senior and junior doctors and nurses identified 80%, 64%, and 32% of key events respectively but only 68%, 58%, and 25% as the events emerged on the 7 minute segments.

Conclusions: Patterns in multichannel trended physiological data which should give early warning of impending problem in a NICU are poorly recognised even by senior doctors and particularly by nurses at the cotside.

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