

Utilizing Simulation to Identify Latent Safety Threats (LSTs) During Neonatal MRI Intramural Transport

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Abstract

Background: In-situ simulation can be used to identify latent safety threats (LSTs) for patients in multiple clinical environments. Magnetic resonance imaging (MRI) is a frequently used, and costly imaging modality that is usually remotely located from most neonatal intensive care units (NICUs). Transport and MRI acquisition can put patients at risk. Our aim was to use simulation to identify LSTs during neonatal MRI transport and to improve transport processes. **Methods:** A prospective observational study was conducted at the Hospital for Sick Children (REB approved). Experienced transport personnel were recruited to participate in scripted simulation scenarios. Simulated 'runs' consisted of taking a neonate with hypoxic brain injury (MRI-compatible low-fidelity manikin) down to the MRI suite and back, in real-time. Data was obtained through self-reporting and direct observation. LST checklists and validated work load indexes were collected.

Results: Ten simulated MRI transports were completed. Four were completed by dedicated transport teams, 3 by scheduled intramural teams (intramural RN & transport MD) and 3 by ad-hoc teams (RT, RN, and/or MD). 17 of 22 participants had >12 months of transport experience. 3 of 10 runs were in intubated patients. The most commonly identified LSTs included: lack of anticipation of clinical deterioration in an unfamiliar location and medication error. Medication-related hazards included: anticipation of medication need, errors in dose verification and administration. Common environmental threats included: confusion around equipment and where to resuscitate the patient once in the MRI suite. Differences in checklist performance were noted between dedicated transport teams and others. Clinicians reported increased mental & physical workload irrespective of patient acuity or years of experience. **Significance:** In-situ simulation was able to identify a number of significant LSTs during neonatal MRI transport, with variation amongst different team configurations. Strategies are as a result now in development for process improvement.

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