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The Use of Waveform Capnography During Neonatal and Pediatric Transport

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Topics: capnography, newborn, pediatric critical care patient transport, waveforms

Purpose: Waveform capnography (WC) is used to non-invasively approximate the arterial partial pressure of carbon dioxide. WC helps confirm initial and maintained endotracheal tube placement, assess the adequacy of mechanical ventilation, and detect the return of spontaneous circulation during cardiopulmonary resuscitation (CPR). As an extension of the intensive care setting, WC measurement may provide similar information in neonatal and pediatric critical care transport. No published data exist describing WC use during neonatal and pediatric transports. We studied the prevalence of current transport WC monitoring, associated clinical indications, and barriers to its use. We hypothesized that WC is used more often for pediatric compared to neonatal transports and that the use of WC is driven by protocol. **Methods:** This descriptive investigation used Ground Air Medical Quality (GAMUT) data on WC use and a custom-designed web survey sent to neonatal and pediatric transport teams contributing to the GAMUT database. This database was created to collect quality metrics to benchmark transport teams and improve transport quality and patient safety. Institutional review board approval was obtained, and data analysis was performed using simple statistics and normality requirements ($n > 5$) for confidence interval

calculation. Results: Data managers from 66 neonatal and pediatric teams were contacted, and 43 responded (65% response rate). The majority of responding teams were combined neonatal/pediatric programs transporting over 250 neonatal and pediatric patients per year. WC rates were highest for pediatric patients (n=3210/3500, 88.7%) compared to neonatal patients (961/2330, 41.2%) among programs reporting at least 20 patients with advanced airways. Of GAMUT's highly performing WC programs, few were identified as predominately pediatric or pediatric/neonatal transport services. Seventy-nine percent of teams had WC available for neonatal transports and 98% for pediatric transports. For teams without WC for neonates, the primary reason reported was a lack of confidence in the information the monitoring provided. Among teams with WC available for neonates, only 64% used WC for neonatal transport. The main reported reason for its non-use in spite of its availability was a lack of confidence in the information the monitoring device provided. WC was used more often among pediatric patients than neonatal patients for monitoring ventilation, assisting, confirming, and maintaining intubation, measuring the effectiveness of CPR and predicting the return of spontaneous circulation. Sixty-five percent of teams reported having a standard set of clinical guidelines as the primary basis for the decision to use WC. Conclusions: This study represents the first quality improvement project to query the GAMUT database regarding WC prevalence, clinical indications and barriers to use among a large sample of neonatal and pediatric transport programs. These results will inform quality improvement efforts to increase WC use during neonatal/pediatric transports.

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Comments

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