Air Medical Journal 35 (2016) 344–347

Contents lists available at ScienceDirect

Air Medical Journal

journal homepage: http://www.airmedicaljournal.com/

Original Research

Benchmarking Pain Assessment Rate in Critical Care Transport

Ryan J. Reichert, MD [1], M. David Gothard, MS [2], Hamilton P. Schwartz, MD [3], Michael T. Bigham, MD [4,*]

[1] Pediatric Resident, Akron Children's Hospital, Akron, OH
[2] Statitician, BIOSTATS, Inc, East Canton, OH
[3] Associate Professor, Department of Pediatrics, Cincinnati Children's Hospital Medical Center, Cincinnati, OH
[4] Associate Professor, Akron Children's Hospital, Akron, OH

A B S T R A C T

The purpose of this study is to determine the rate of pain assessment in pediatric neonatal critical care transport (PNCCT). The GAMUT database was interrogated for an 18-month period and excluded programs with less than 10% pediatric or neonatal patient contacts and less than 3 months of any metric data reporting during the study period. We hypothesized pain assessment during PNCCT is superior to prehospital pain assessment rates, although inferior to in-hospital rates. Sixty-two programs representing 104,445 patient contacts were analyzed. A total of 21,693 (20.8%) patients were reported to have a documented pain assessment. Subanalysis identified 17 of the 62 programs consistently reporting pain assessments. This group accounted for 24,599 patients and included 7,273 (29.6%) neonatal, 12,655 (51.5%) pediatric, and 4,664 (19.0%) adult patients. Among these programs, the benchmark rate of pain assessment was 90.0%. Our analysis shows a rate below emergency medical services and consistent with published hospital rates of pain assessment. Poor rates of tracking of this metric among participating programs was noted, suggesting an opportunity to investigate the barriers to documentation and reporting of pain assessments in PNCCT and a potential quality improvement initiative.

With the regionalization of pediatric and neonatal specialty care, there is an increasing need for interfacility transport from local to regional hospitals for specialized pediatric and neonatal care. As a result, over 200,000 neonatal and pediatric patients are being transported for specialty care in the United States alone.[1] Experts recognize the importance of monitoring the quality of care provided in pediatric/neonatal critical care transport (PNCCT). In response, the 2012 Pediatric/Neonatal Transport Quality Summit was convened and using consensus methodology identified/defined key quality metrics.[2] The importance of this metric for all transported patients was affirmed during the Air Medical Physicians Association (AMPA) Quality Metrics Summit. This quality work served as the foundation for the critical care transport-specific efforts to incorporate the Institute of Medicine's approach to accelerate improvement in health care.[3]

Pain management was identified through the modified Delphi process as a key quality metric. The National Quality Forum suggests quality measures be important, scientifically acceptable, usable, and feasible, prompting the AMPA's agreement to identify "documentation of pain assessment" as a proxy measure of pain management in critical care transport. The rationale lies in the understanding that pain has been found to be present in a large percentage of pediatric patients seeking medical care, and its management is recognized by the World Health Organization as a human right.[4] Additionally, The Joint Commission Standards require pain assessment for all hospitalized patients.[5] Studies have shown that despite these requirements, infants and children have fewer pain assessments, a fact that limits appropriate pain management in prehospital and hospital settings.[6] Rates of pediatric pain assessment in the prehospital and hospital settings vary widely, ranging from 4% to 31% in the prehospital and, similarly, a variable 58% to 100% in the hospital setting.[7-10]

The priority placed on pain assessment as a key quality metric in the field of critical care transport has highlighted the absence of published performance benchmarks for pain assessment in this setting. In response, this study seeks to describe the rate of pain assessment in PNCCT. Our hypothesis is that pain assessment during PNCCT is superior to published prehospital pain assessment rates, although inferior to published in-hospital pain assessment rates.

* Address for correspondence: *Michael T. Bigham, MD, Associate Professor, Akron Children's Hospital, Akron, OH.*
E-mail address: mbigham@chmca.org (M.T. Bigham).

1067-991X/$36.00

http://dx.doi.org/10.1016/j.amj.2016.07.001

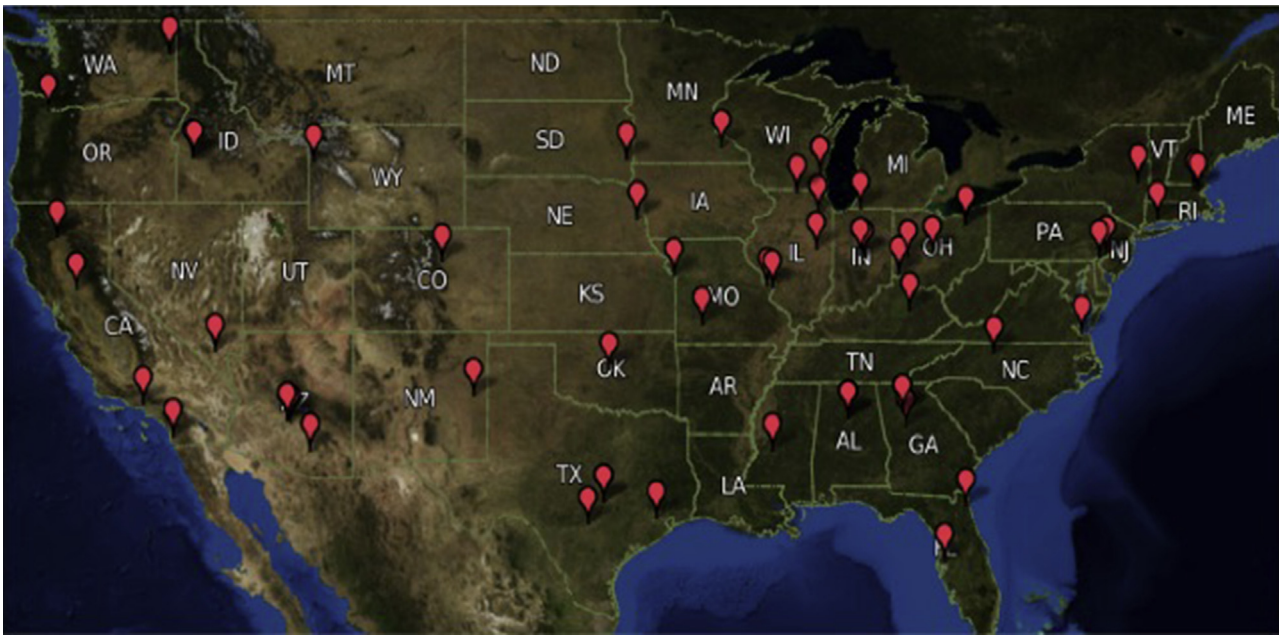

Figure 1. A map of the contiguous United States of America with annotations of locations submitting GAMUT QI Collaborative data during the 18-month study period. Geographic locations with multiple programs participating are represented by only a single marker.

Methods

An international collaborative, Ground Air Medical qUality Transport Quality Improvement (GAMUT QI) Collaborative, of critical care transport programs is voluntarily submitting data to the GAMUT database.[11] These programs report on consensus quality metrics identified by either the American Academy of Pediatrics Section on Transport Medicine Quality Summit or AMPA Quality Metrics Summit in 2012 or 2013.[2,12] Over an 18-month period (January 2014 through June 2015), metric data were deidentified and aggregated monthly at each individual transport program. Study data were collected and managed using Research Electronic Data Capture (REDCap) hosted at the GAMUT QI Collaborative.[13] REDCap is a secure, Web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry, 2) audit trails for tracking data manipulation and export procedures, 3) automated export procedures for seamless data downloads to common statistical packages, and 4) procedures for importing data from external sources. The GAMUT database was then interrogated retrospectively for the 18-month study period looking specifically at the following metric definition: the number of patient contacts with documented pain assessment using the age-appropriate pain scales among all patient contacts.

The initial data analysis excluded programs with less than 10% pediatric and neonatal patient contacts and less than 3 months of any metric data reporting during the study period. Tracking programs were further identified if they submitted pain assessment data for at least 50% of the study months. Quality metrics data for participating programs were tabulated in Excel (Microsoft, Redmond, WA).

A comparison of those programs actively tracking pain assessments with those not tracking pain assessments was performed to identify potential distinguishing response characteristics. The geographic region of each institution was identified using the first digit of the zip code of that institution's location, and a comparison of the rate of tracking was performed by geographic regions defined by zip code. A Pearson chi-square test was performed to determine whether there were overall differences in tracking pain assessments by geographic region, and then Bonferroni adjusted z tests were performed to identify specific differing geographic regions. Mann-Whitney U tests were used to identify volume and patient contact profiles that may be related to institutions that track pain assessments.

A run chart was constructed for those institutions that track pain assessments to display the mean monthly percentage of contacts that have tracked pain assessments from January 2014 to June 2015. A 2-period moving average was constructed to show smooth, consistent time trends. All statistical tests were 2-sided with $P < .05$ considered statistically significant and were performed using SPSSv23.0 statistical software (IBM Corp, Armonk, NY).

Results

The 62 specialty transport teams reporting GAMUT data in any category are shown by geographic location in Figure 1. A total of 104,458 patient contacts were reported into the database during this 18-month period. This includes 15,201 (14.6%) neonatal, 34,807 (33.3%) pediatric, and 54,450 (52.1%) adult patient contacts (Table 1). Of the total patient contacts, 21,693 (20.8%) had a pain assessment tracked in the GAMUT database.

When evaluating pain assessment rates by program, we found only 17 programs consistently tracked pain assessment for greater than 3 months (median months reporting = 7 months, range 3-18 months). This group accounted for 24,591 total patient contacts and included 7,273 (29.6%) neonatal, 12,655 (51.5%) pediatric, and 4,664 (19.0%) adult patient contacts (Table 2). Among these programs, the overall rate of documented pain assessment was 82.6% with the monthly rates reported in Figure 2. After an initial 6-month variability in pain assessment rates, steady-state performance showed 90.0% of patient contacts with a documented pain assessment during the final 12 months of the study.

During post hoc analysis, we defined response bias among all GAMUT transport programs (Table 3). There is an association among programs that track versus those that do not track pain assessments according to geographic region of the transport program. The Midwest US region is associated with higher rates of