OBJECTIVE: Our objective was to construct a prospective high-quality and high-frequency database combining patient therapeutics and clinical variables in real time, automatically fed by the information system and network architecture available through fully electronic charting in our PICU. The purpose of this article is to describe the data acquisition process from bedside to the research electronic database.

SETTING: A 24-bed PICU, medical ICU, surgical ICU, and cardiac ICU in a tertiary care free-standing maternal child health center in Canada.

PATIENTS: All patients less than 18 years old were included at admission to the PICU.
INTERVENTIONS: None.

MEASUREMENTS AND MAIN RESULTS: Between May 21, 2015, and December 31, 2016, 1,386 consecutive PICU stays from 1,194 patients were recorded in the database. Data were prospectively collected from admission to discharge, every 5 seconds from monitors and every 30 seconds from mechanical ventilators and infusion pumps. These data were linked to the patient’s electronic medical record. The database total volume was 241 GB. The patients’ median age was 2.0 years (interquartile range, 0.0-9.0). Data were available for all mechanically ventilated patients (n = 511; recorded duration, 77,678 hr), and respiratory failure was the most frequent reason for admission (n = 360). The complete pharmacologic profile was synched to database for all PICU stays. Following this implementation, a validation phase is in process and several research projects are ongoing using this high-fidelity database.

CONCLUSIONS: Using the existing bedside information system and network architecture of our PICU, we implemented an ongoing high-fidelity prospectively collected electronic database, preventing the continuous loss of scientific information. This offers the opportunity to develop research on clinical decision support systems and computational models of cardiorespiratory physiology for example.

Reference:


doi: 10.1097/PCC.0000000000001460.

Thank you to our partners for supporting IVTEAM