AJOG American Journal of Obstetrics & Gynecology

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VOLUME 228, ISSUE 1, SUPPLEMENT , S655-S656, JANUARY 2023

https://www.ajog.org/article/S0002-9378(22)01987-1/fulltext

102 An artificial-intelligence-based clinical decision support application reduces the rate of adverse clinical events

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OBJECTIVE: We set to determine if the Medical Brain® (MB), an artificial intelligence (AI)-based clinical decision support application designed to improve patient safety, has assisted in reducing the incidence of predefined adverse clinical events (hereinafter referred to as Red Never Events (RNEs).

STUDY DESIGN: MB algorithms had been created based on guidelines and best practices vetted by departmental and hospital leadership. RNEs tracked were lack of admistering antibiotics for group B sterp positive patients in labor, lack of admisterating magnesium sulfate for seizure prophylaxis in pateitns with severe preeclampsia, and not discontinuing Pitocin in laboring patietns with a non reassuring fetal heart rate tracing. A retrospective analysis was then divided into four phases tracking the rate of RNEs: 1) June 2018-June 2019: pre-implementation phase (phase 0). 2) July 2019- Jan 2020: roll-out phase (phase 1). 3) Feburary 2020-June 2020: Covid peak (phase 2), and 4) July 2020-May 2022: Post-Intervention phase (phase 3). The number of RNEs per 1000 live births per month was analyzed by Statistical Process Control (SPC) using Statistical software JMP Pro 16. One-way ANOVA was used to detect a statistically significant difference between the four phases.

RESULTS: Between June 2018 to May 2022, we had 1,424 RNEs and a total of 28,300 Live births. The average total RNEs per 1000 live births decreased from 117.5 in phase 0 to 10.9 per 1000 live births in phase 3, a 90.7% reduction (Figure 1). The Statistical Process Control (SPC) U-Chart demonstrated no special cause signal during phase 0, indicating random variation. Furthermore, analysis showed a shift in the centerline during phase analysis 1, 2, and 3. The dif- ference was statistically significant among the 4 phases on one-way ANOVA ($p < 0.0001$). The LOESS Fit Plot shows a downward trend from the Pre-to-Post-Intervention period (Figure 2).

CONCLUSION: The use of an AI-based clinical decision support application successfully reduced the rate of adverse clinical events and has aided in avoiding clinical mishaps in a busy obstetrical unit

Figure 1: Individual Control Chart of Red Never Events RNEs by Phases

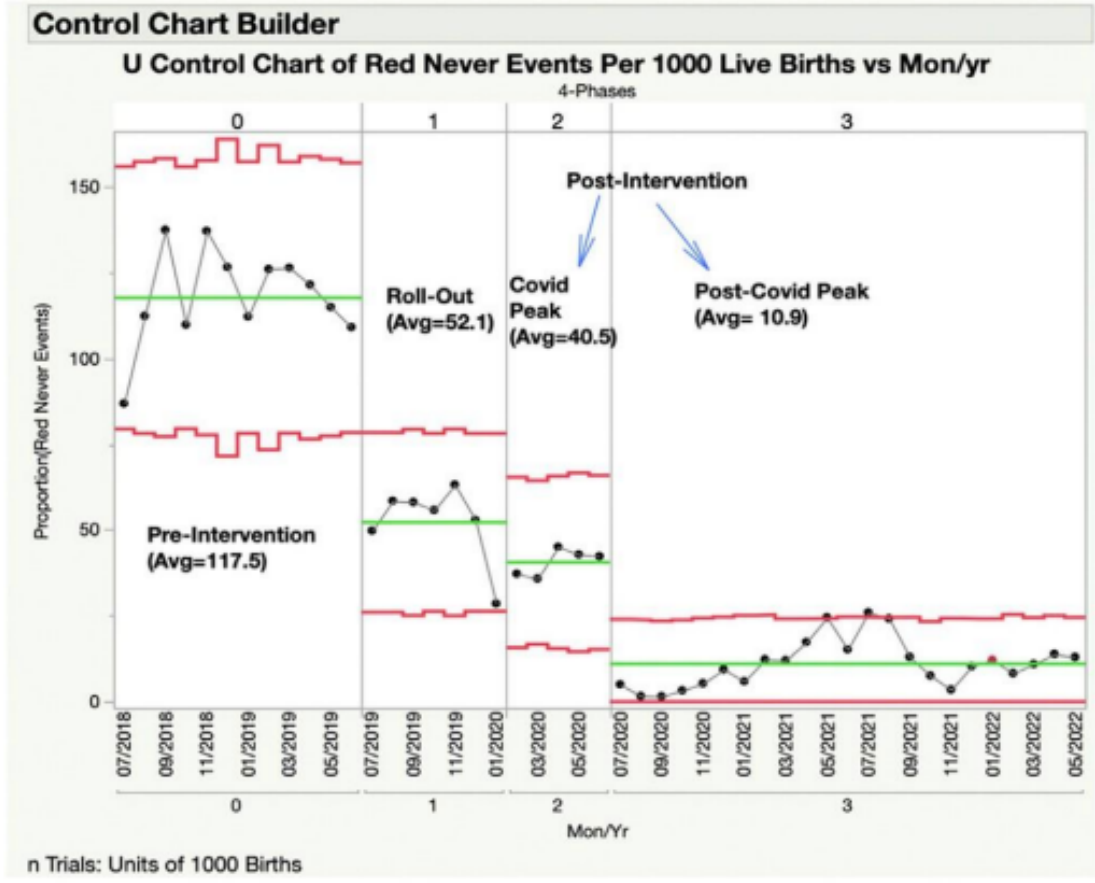

Figure 2: LOESS Fit Plot of Red Never Events vs. Month/Year