

A Digital Nudge Increases Thoracic Epidural Confirmation Rates and Reduces Epidural Failure: A Quality Improvement Initiative

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Background

- Evidence supports epidural confirmation techniques, but they remain underutilized [1,2]
- Digital nudges influence clinical decision-making when thoughtfully implemented [3,4]

Aims

- Primary outcome: Can a digital nudge increase the rate of epidural confirmation?
- Secondary outcome: Can a digital nudge lead to more effective epidurals clinically?

Methods

- Opt-in documentation option implemented on October 25th, 2021 in the existing electronic medical record
 - Saline column, electrical stimulation, test dose sensory level, other, none
- Confirmation technique documentation rates and catheter duration were assessed for the following periods:
 - Pre-intervention period: Oct 2020 – Oct 2021
 - Adaption period: Nov 2021 – May 2022
 - Post-intervention period: June 2022 – July 2023
- Epidural failure: ≤48 hours duration

Results

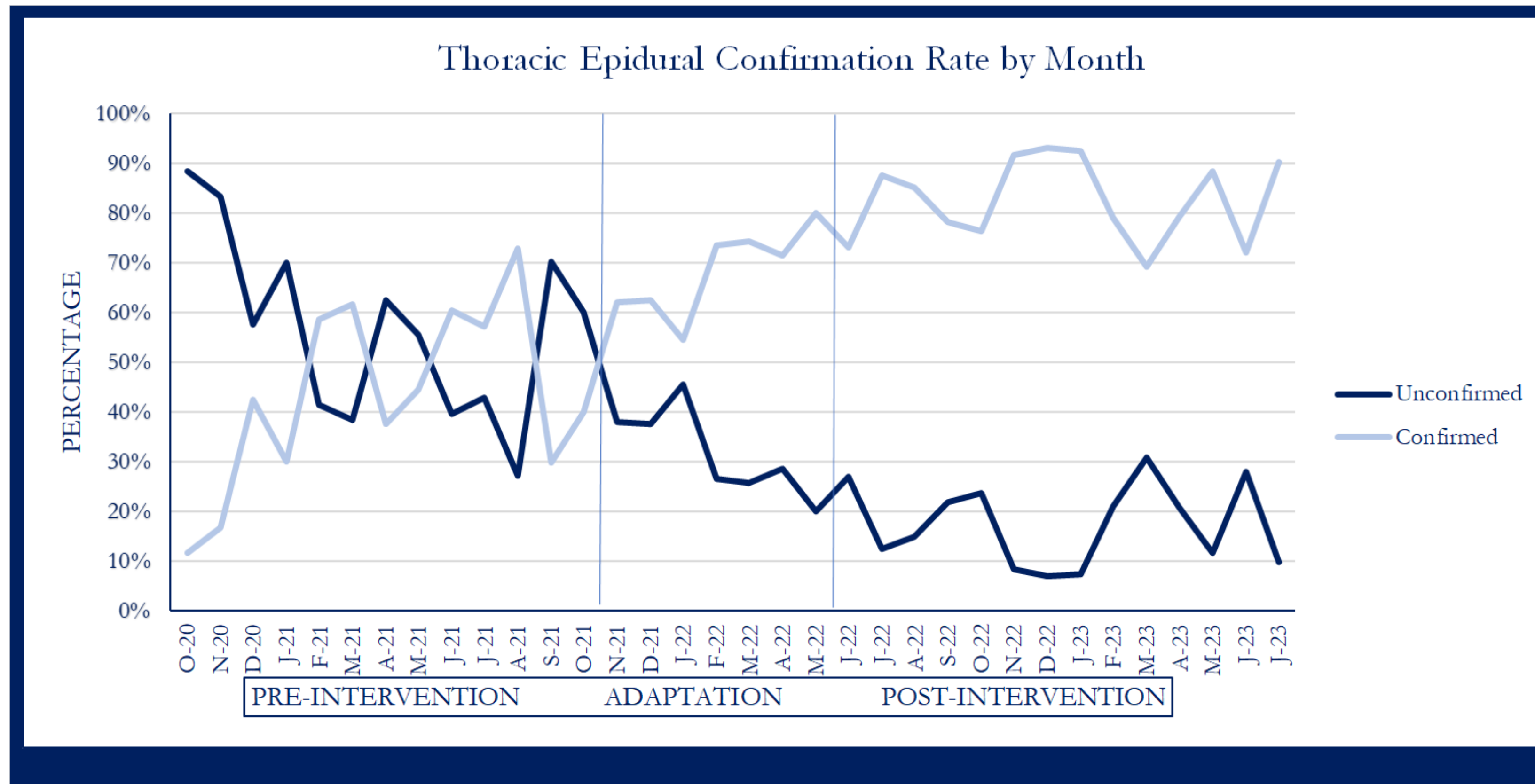


Figure 1: Thoracic Epidural Confirmation Rate by Month

Category	Value	Category	Value	P-Value
Sum Total	1148			
Pre-Intervention Total	418	Post-Intervention Total	483	
Male	175	Male	214	0.46
Female	243	Female	269	
Mean Age	58.0	Mean Age	58.6	0.58
BMI < 30	314	BMI < 30	380	0.21
BMI ≥ 30	104	BMI ≥ 30	103	
Placed by regionalist	180	Placed by regionalist	293	< 0.001
Non-regionalist	238	Non-regionalist	190	
Placed in OR	194	Placed in OR	158	< 0.001
Out of OR	224	Out of OR	325	
Confirmed	192	Confirmed	396	< 0.001
Unconfirmed	226	Unconfirmed	87	
Saline Column	83	Saline Column	355	< 0.001
Electrical Stimulation	60	Electrical Stimulation	88	0.14
Test-Dose	143	Test-Dose	160	0.73
Confirmed Once	122	Confirmed Once	220	< 0.001
Confirmed Twice	46	Confirmed Twice	146	< 0.001
Confirmed Thrice	24	Confirmed Thrice	30	0.89

Table 1: Demographics in the Pre- and Post-Intervention Periods

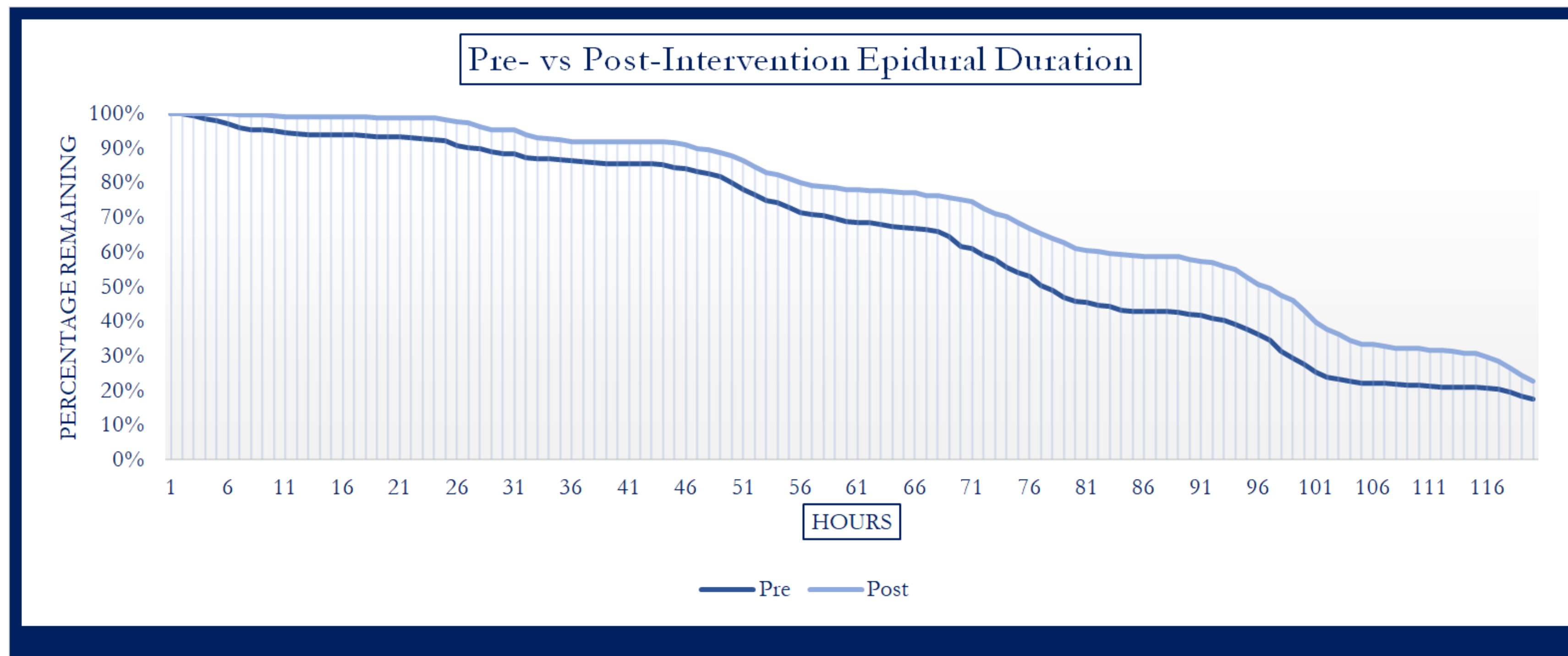


Figure 2: Pre- vs Post-Intervention Epidural Duration

Category	OR	95% CI	P-Value
Post-Intervention, Unadjusted	0.56	0.38-0.82	0.003
Post-Intervention, Adjusted	0.58	0.39-0.86	0.007

Table 2: Odds Ratios for Epidural Failure in the Post-Intervention Period

Results

- Confirmation documentation rate increased from 46% to 82% (P < 0.001), (Figure 1)
- Pre-intervention failures: 73 (18%)
- Post-intervention failures: 51 (11%)
- Unadjusted odds ratio (OR) of epidural failure was 0.56 (95% CI: 0.38-0.82, P = 0.003) (Table 2)
- Adjusted OR was 0.58 (95% CI: 0.39-0.86, P = 0.007).
- Duration was 10 hours longer (P < 0.001) in the post-intervention period (Figure 2)
- NNT to prevent one epidural failure was 11

Discussion

- Digital nudge significantly improved epidural confirmation and failure rates
- Potentially prevent about 10% of thoracic epidural failures per year
- Assumption made regarding removal, but epidural catheters may be removed early due to patient/surgeon preference, discharge requirements, and/or other unaccountable factors
- Failure interval up to 48 hours is pragmatic but imperfect [5]

References

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