

The effect of painful contractions on time perception during epidural placement for labor analgesia

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Background

- Time PERCEPTION $\neq$ Physical Time
- Emotion, attention, & anxiety influence subjective passage of time.
- Acute pain can cause expansion of time perception.

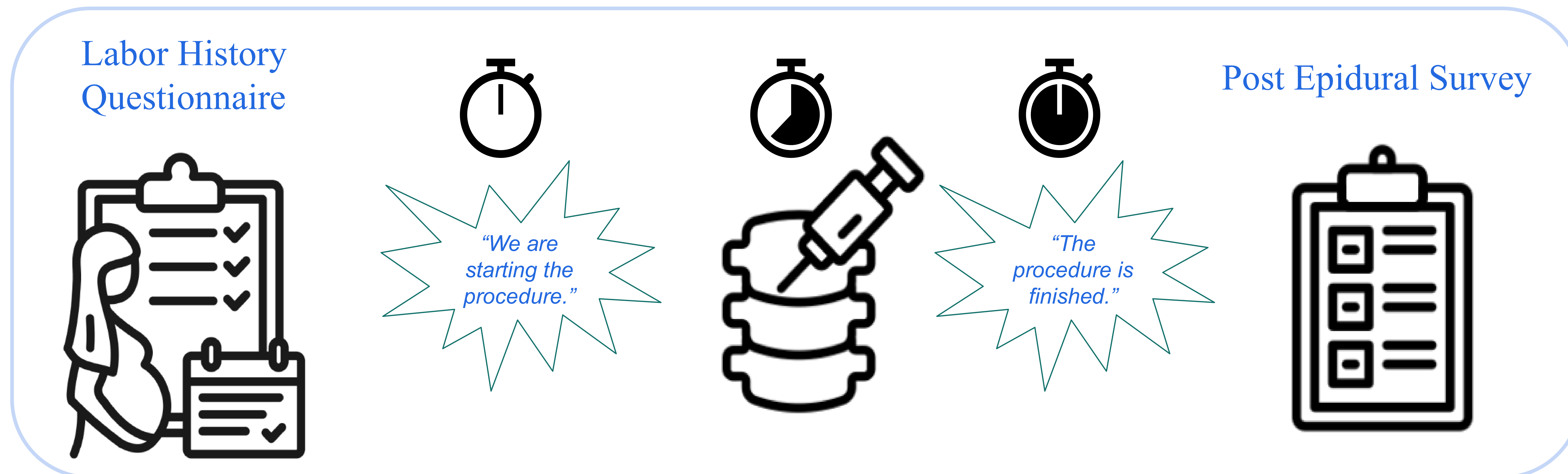


Hypothesis

- Patient-reported pain score during epidural placement is associated with patient-reported time to placement.

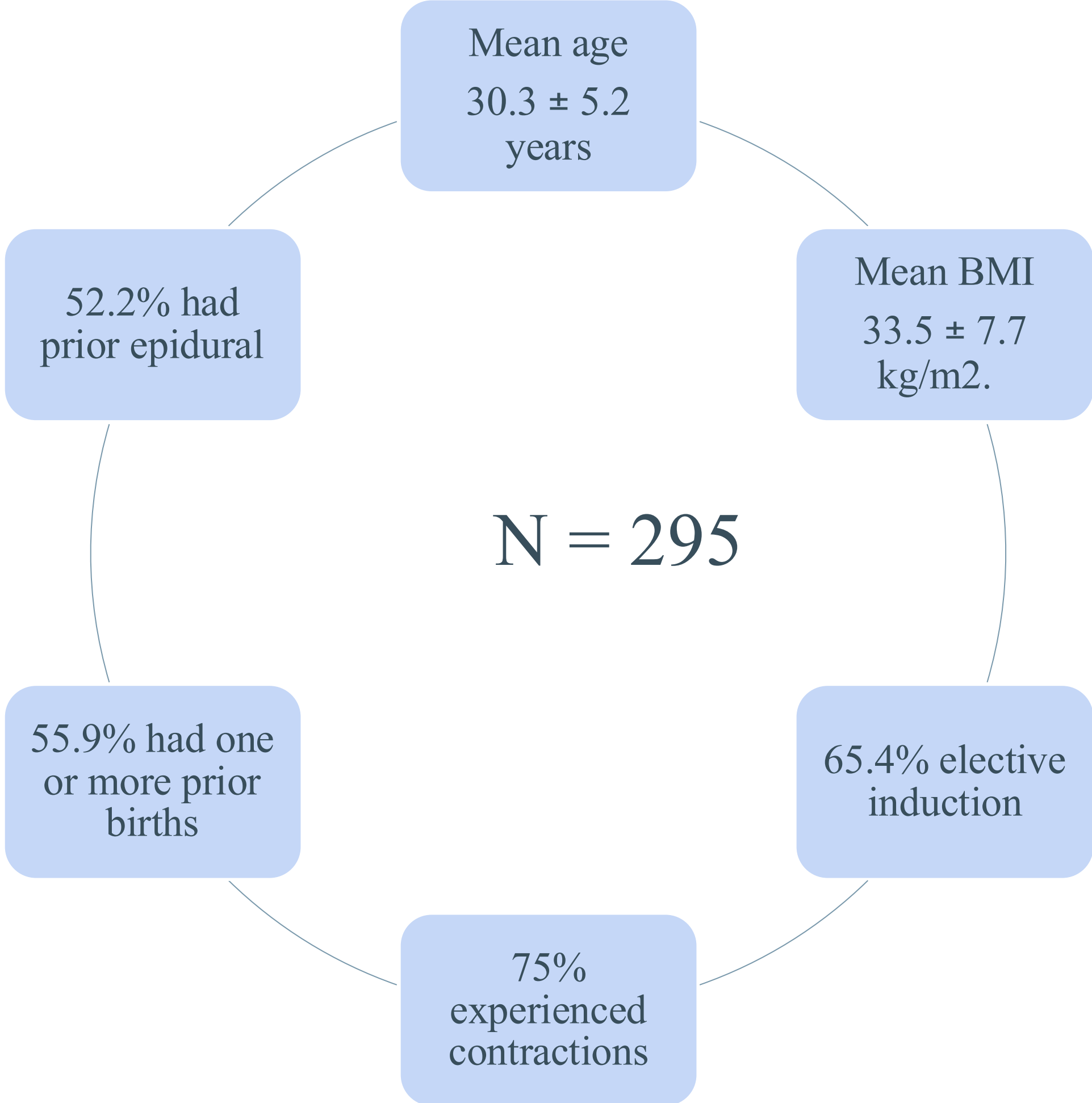
Methods

- Women ≥ 18 years old presenting for a vaginal delivery at MUSC's Labor & Delivery Unit
- Exclusion Criteria
 - History of opioid medication use or substance use disorder
 - History of pre-existing chronic pain conditions
 - Use or pre-medication for pain control (nalbuphine, nitrous oxide, etc.)
 - Painful contractions while consenting for labor epidural*
 - Non-English-speaking patients
- Information Collected
 - Age, BMI, self-reported race & ethnicity
 - Number of prior births and mode of delivery
 - History of prior epidural and mode of delivery
 - Urgency of cesarean delivery – elective or unplanned
 - Induction vs spontaneous labor
 - Pain score (VAS scale) with or without contractions during epidural placement



*Exclusion criteria required by MUSC IRB

Results



Pain score during epidural placement with or without contraction was not associated with perceived time to epidural placement.

- Only **observed** time to epidural placement and having a **prior epidural** was associated with perceived time.
- A **5-minute increase** in observed placement time was associated with a **3.1-minute increase in perceived time to placement**, (P < 0.001)
 - Having a prior epidural was associated with a **2-minute increase** in perceived time to placement, adjusting for other factors (P = 0.0140)

111/295 (37.6%) estimated placement time was larger than the observed placement time

Table 1. Epidural placement experience (n = 295)		
Did you have contractions during epidural placement, Yes, n (%)	222 (75.3)	
Pain score (regardless of contraction), median (IQR; range)	50 (20-70; 0-100)	
With contraction, median (IQR; range)	55 (30-70; 0-100)	
Without contraction, median (IQR; range)	30 (5-40; 0-80)	
Actual time to placement, minutes, mean (SD)	12.5 (8.86)	
Perceived time to placement, minutes, mean (SD)	10.6 (8.62)	
With contractions, minutes, mean (SD)	11.1 (8.99)	
Without contractions, minutes, mean (SD)	9.28 (7.28)	
Difference in perceived vs actual time, minutes, mean (SD)	-1.93 (7.35)	
With contractions, minutes, mean (SD)	-1.75 (7.82)	
Without contractions, minutes, mean (SD)	-2.46 (5.71)	
Report longer time to placement than actual, n (%)	111 (37.6)	
Confidence in your perceived time, n (%)		
Not at all	49 (18)	
Slightly	66 (25.1)	
Moderate	101 (38.4)	
Considerable	27 (10.3)	
Extremely	20 (7.6)	

Table 2. Multivariable linear regression model of perceived epidural placement time			
Variable	Mean Difference (95% CI)	P	
Pain score, 10 point	0.095 (-0.216, 0.406)	0.5484	
Contraction, Yes vs No	1.129 (-0.845, 3.103)	0.2613	
Observed placement, 5-minute increase	3.097 (2.653, 3.541)	<0.001	
Patient age, 5-year increase	-0.080 (-0.857, 0.697)	0.8399	
Patient BMI, 5 kg/m2 increase	0.252 (-0.308, 0.813)	0.3764	
Race		0.9099	
Black vs White	-0.411 (-2.640, 1.818)		
Other vs White	-0.117 (-3.695, 3.460)		
Black vs Other	-0.294 (-4.187, 3.599)		
Prior epidural, Yes vs No	1.998 (0.407, 3.589)	0.0140	
Prior cesarean delivery, Yes vs No	-0.650 (-3.453, 2.153)	0.6484	
Current labor, elective vs spontaneous	-0.256 (-2.039, 1.527)	0.7776	

Table 3. Patient characteristics by under- or over-estimation.			
	Underestimate (N = 184)	Overestimate (N = 111)	P
Age, years, mean (SD)	30.2 (5.32)	30.4 (4.88)	0.709
BMI, kg/m2, mean (SD)	34.1 (8.02)	32.4 (6.90)	0.071
Race, n (%)			0.122
Black	58 (31.5)	25 (22.5)	
White	111 (60.3)	80 (72.1)	
Other	15 (8.15)	6 (5.41)	
Ethnicity, n (%)			1.000
Hispanic	11 (5.98)	7 (6.31)	
Non-Hispanic	171 (92.9)	103 (92.8)	
Unknown	2 (1.09)	1 (0.90)	
Current labor type, n (%)			0.876
Elective induction	121 (65.8)	72 (64.9)	
Spontaneous labor	63 (34.2)	39 (35.1)	
Prior Births, Yes, n (%)	96 (52.2)	69 (62.2)	0.094
Number of prior deliveries, median (IQR)	1 (0-1)	1 (0-2)	0.161
Number of prior vaginal deliveries, median (IQR)	0 (0-1)	0 (0-1)	0.191
Number of prior cesarean deliveries, median (IQR)	0 (0-0)	0 (0-0)	0.910
Did you ever receive an epidural, Yes, n (%)	90 (48.9)	64 (57.7)	0.145
Did you have contractions during placement, Yes, n (%)	135 (73.4)	87 (78.4)	0.334
Pain score, median (IQR)	50 (20-70)	50 (20-70)	0.660
Observed time of placement, min, median (IQR)	11.0 (7.63-18.1)	8.07 (6.02-10.4)	<0.001

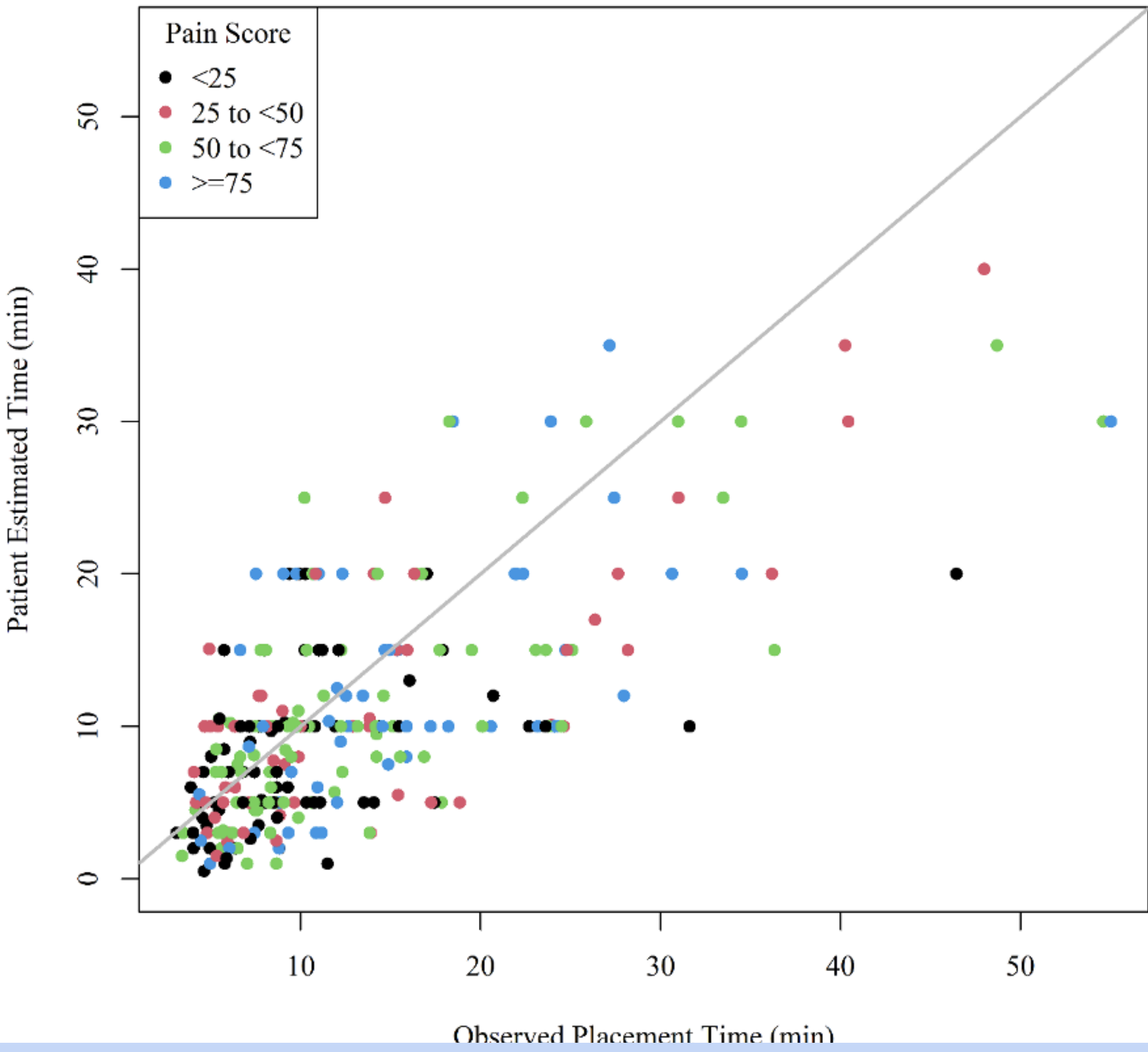


Figure 1: The observed time versus estimated time with quartile of pain score shown in different colors.

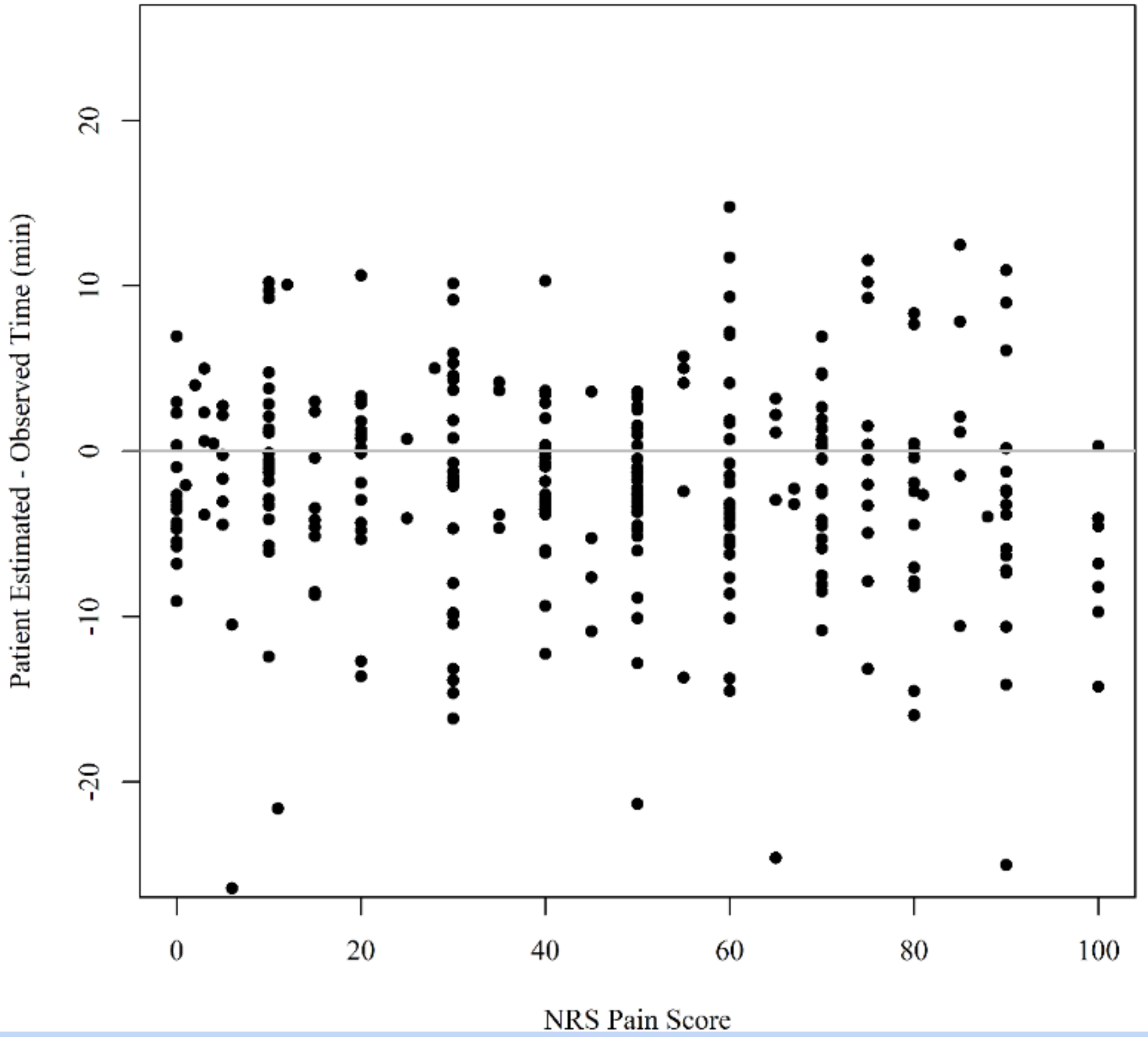


Figure 2: Pain score versus the difference between estimated and observed placement time

Discussion/Conclusion

In the setting of acute cyclical pain of labor and pain associated with labor epidural placement, retrospective temporal sensitivity and subjective perception of the rate of passage of time is **not altered**.



Limitations

- Did not account for confounding variables – BMI, ADHD, anxiety, depression
- Exclusion of patients in **severe** pain
- Prospective study design with retrospective question

Clinical Implications

- Patient education by anesthesia team
- Encouraging earlier request of labor epidural

Future Directions

- Comparing patient satisfaction with time perception
- Comparing time perception or patient satisfaction with or without variables: music, provider narration