



15th Annual Nursing Research Conference

An Evaluation of TENS

for Pain Management in Early Labor

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Women's & Children's Service Line

Background/Rationale

- Value-added service to laboring women
- Inexpensive alternative pain relief option
- Minimize medical interventions
- Reduce length of stay and associated costs



Study Title: Evaluating Use of TENS for Pain Management in Laboring Women



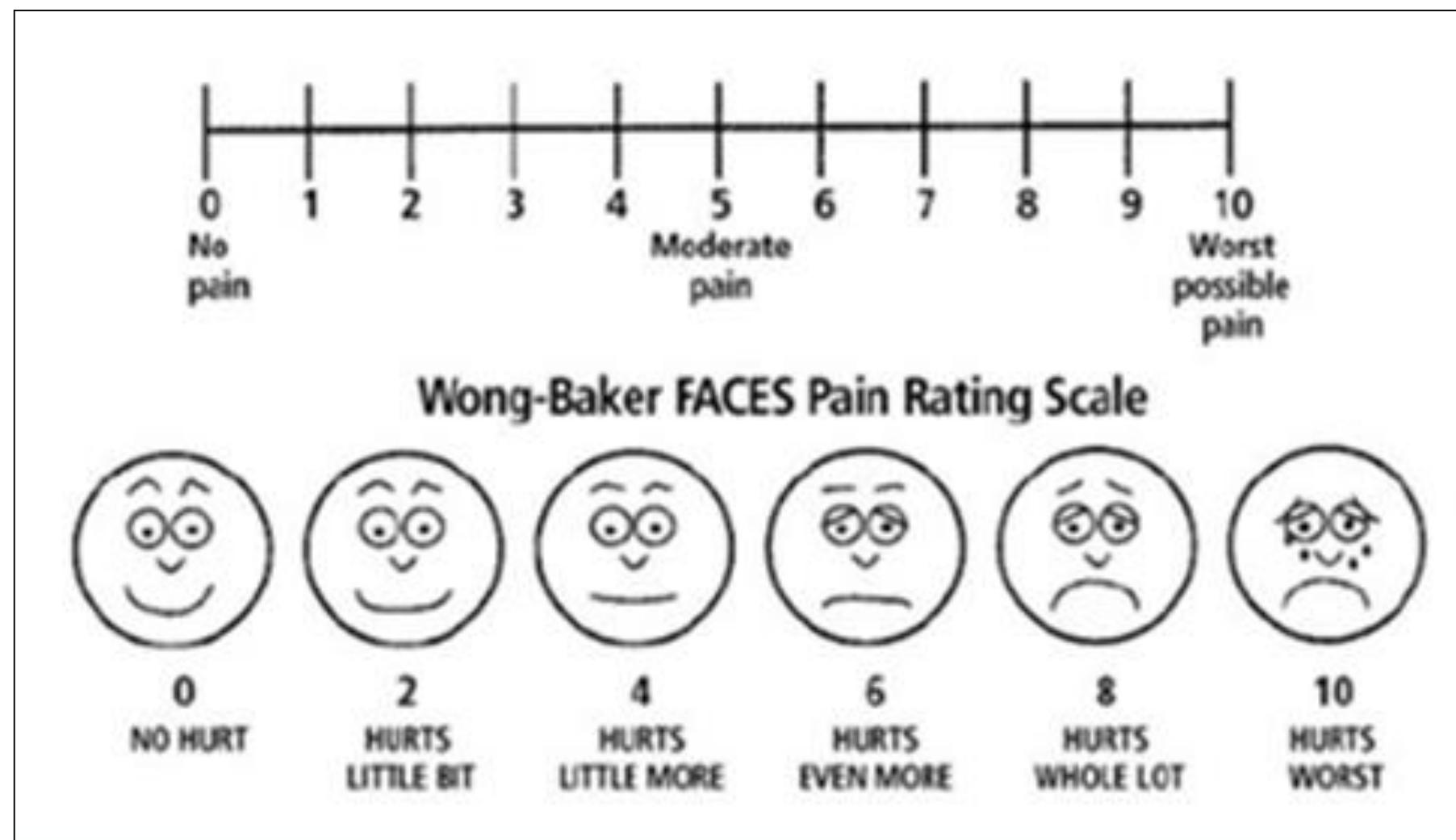
Study Objectives

Evaluate effectiveness of TENS:

- **Improve labor pain management**
- **Patient satisfaction**



Primary Outcomes



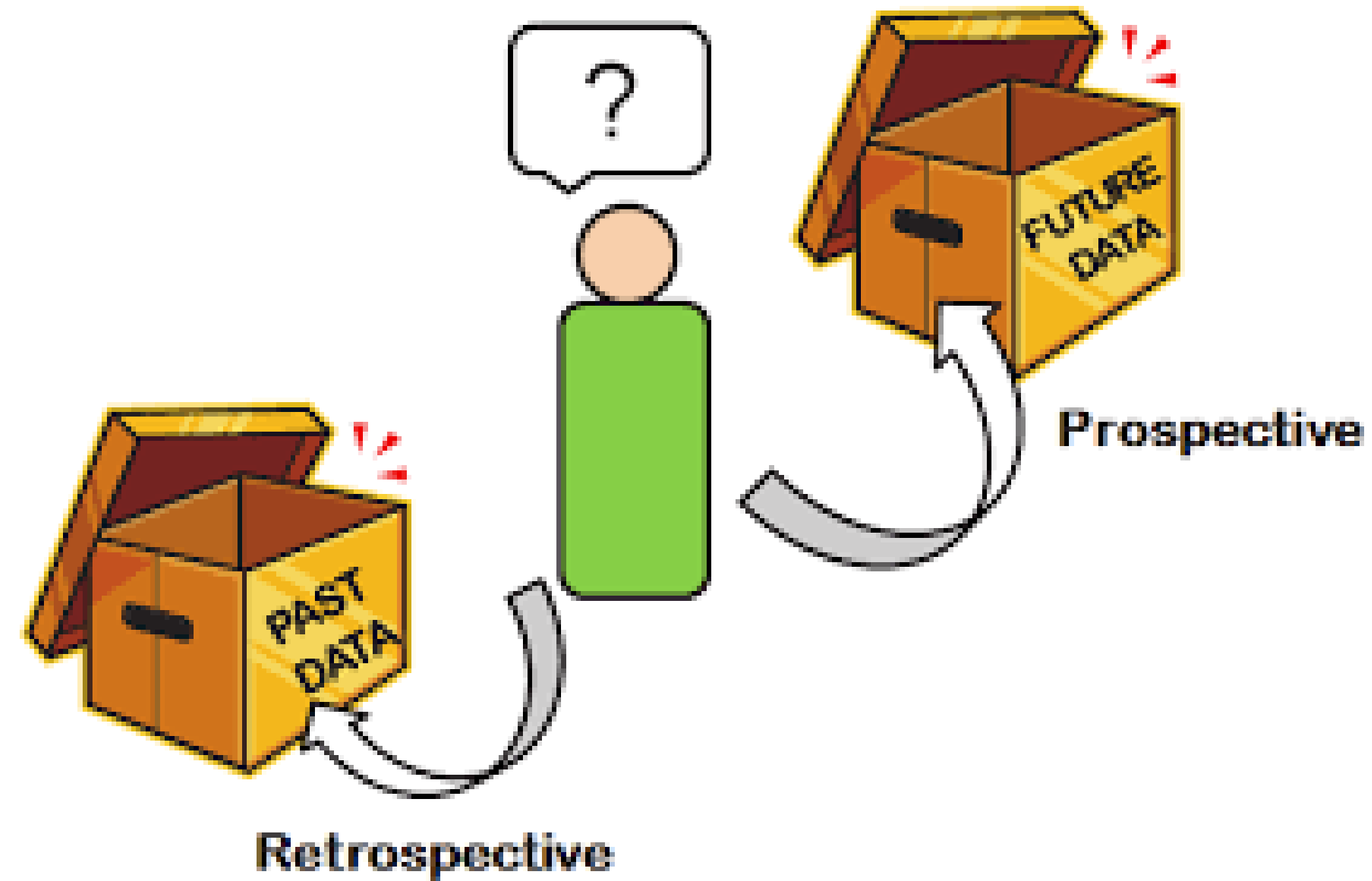
Perceived pain pre and post TENS application

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Please answer the following questions:					
1. The TENS unit was easy to apply and use.					
2. I appreciated having the TENS unit to help me manage my pain in early labor					
3. The TENS unit helped me manage my pain throughout labor					
4. I would use the TENS unit again to help with controlling my labor pain					
5. I would recommend use of the TENS unit for labor					
6. Using the TENS unit allowed me to have better control over my labor process					
Please share any comments regarding the use of TENS unit during your labor:					

Patient satisfaction with TENS assessed after delivery

Study Design

Prospective, exploratory design using convenience sampling.



Study Population



Inclusion Criteria

- Women with a cephalic gestation at ≥ 37 weeks gestation.
- Presenting for induction of labor, or to rule out labor, or in spontaneous labor for an anticipated vaginal delivery of a healthy newborn.
- Women planning delivery at the Christiana Care Hospital



Exclusion Criteria

- Women scheduled to deliver by cesarean section during the investigational time period, except TOLAC (Trial of Labor after Cesarean) patients.
- Women presenting to rule out labor at gestational age < 37 weeks gestation.
- Women delivering an infant with a known major fetal anomaly or intrauterine fetal demise.
- Criteria excluding the use of a TENS unit including patients with a pacemaker, cardiac problems, hypertension, epilepsy, or allergic reaction to the electrodes, gel or tape.

Risks and Benefits

Benefits

- **May or may not directly help with managing the discomforts of labor.**
- **May enable management of labor discomforts longer at home**
- **Study outcomes may demonstrate effects not previous reported**

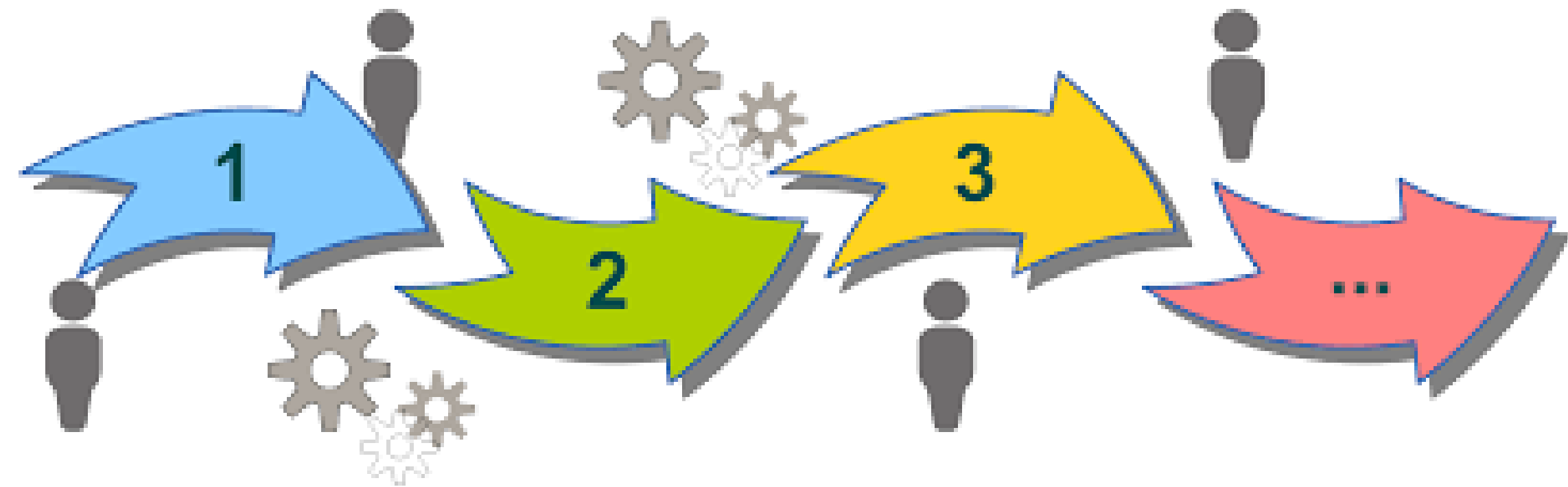
Risks

- **Isolated cases of skin irritation (electrode burns) may occur at the site of electrode placement following long term application.**
- **Safe use in pregnancy not established in USA**



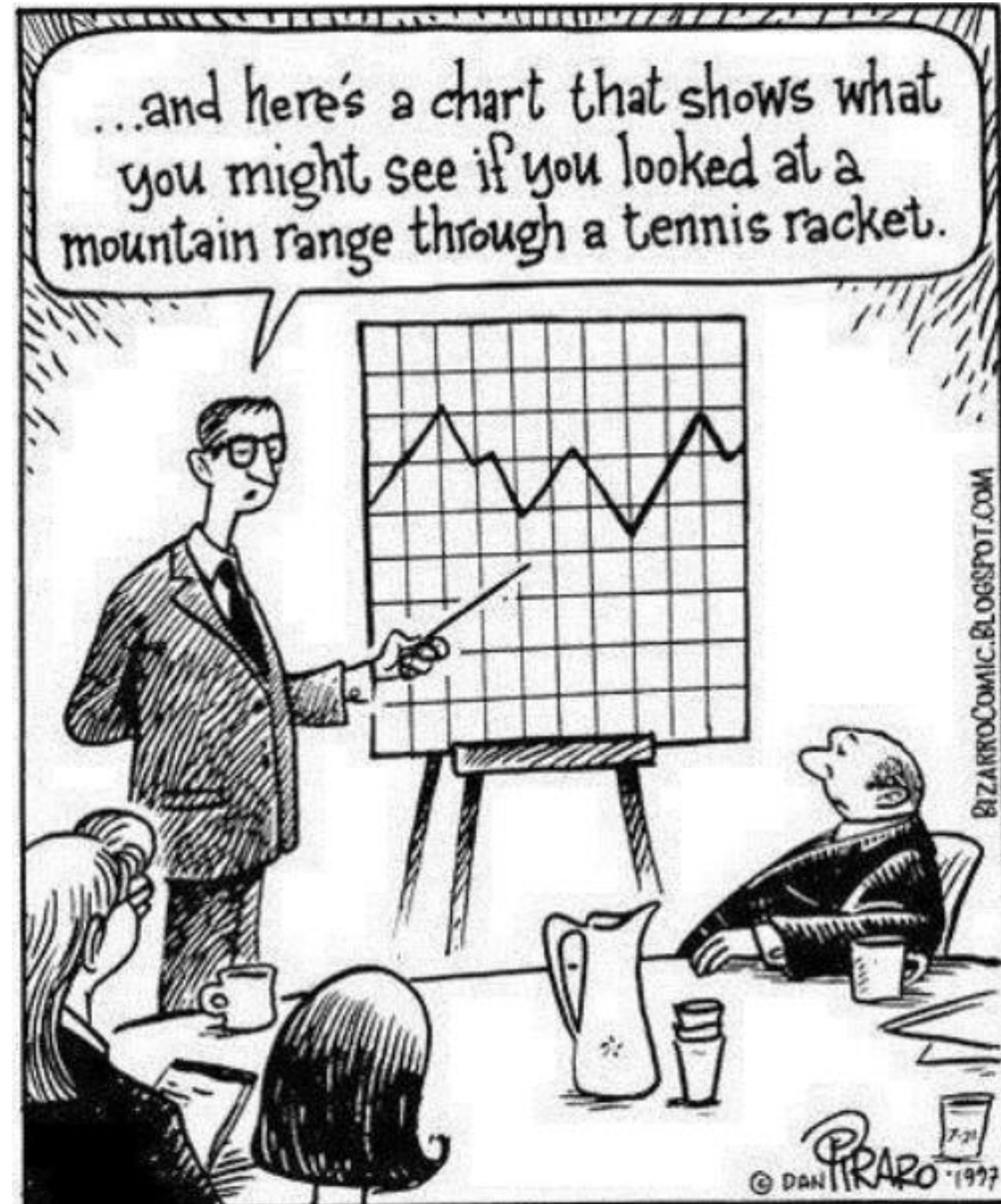
Study Procedures

1. Patient presents to OB triage to r/o labor
2. Study nurse screened and assessed eligible patients
3. Informed consent obtained
4. Patient and support person educated
5. Initial pain assessment completed
6. Study nurse applied TENS
7. Patient sent walking for 2 hour or sent home
8. Second pain assessment completed
9. Patient satisfaction completed after delivery



Statistical Methods

- **Descriptive Statistics**
- **Pre and post TENS application pain scores**
- **Mann Whitney U test (due to use of an ordinal pain scale)**



Participant Characteristics

- Age 15-44 years (M27.4 \pm 5.3)
- Nulliparity 65% (176/272)
- Race:
 - 52% (141/272) Caucasian
 - 33% (90/272) African American
 - 9% (24/272) Asian
 - 6% (17/272) Other



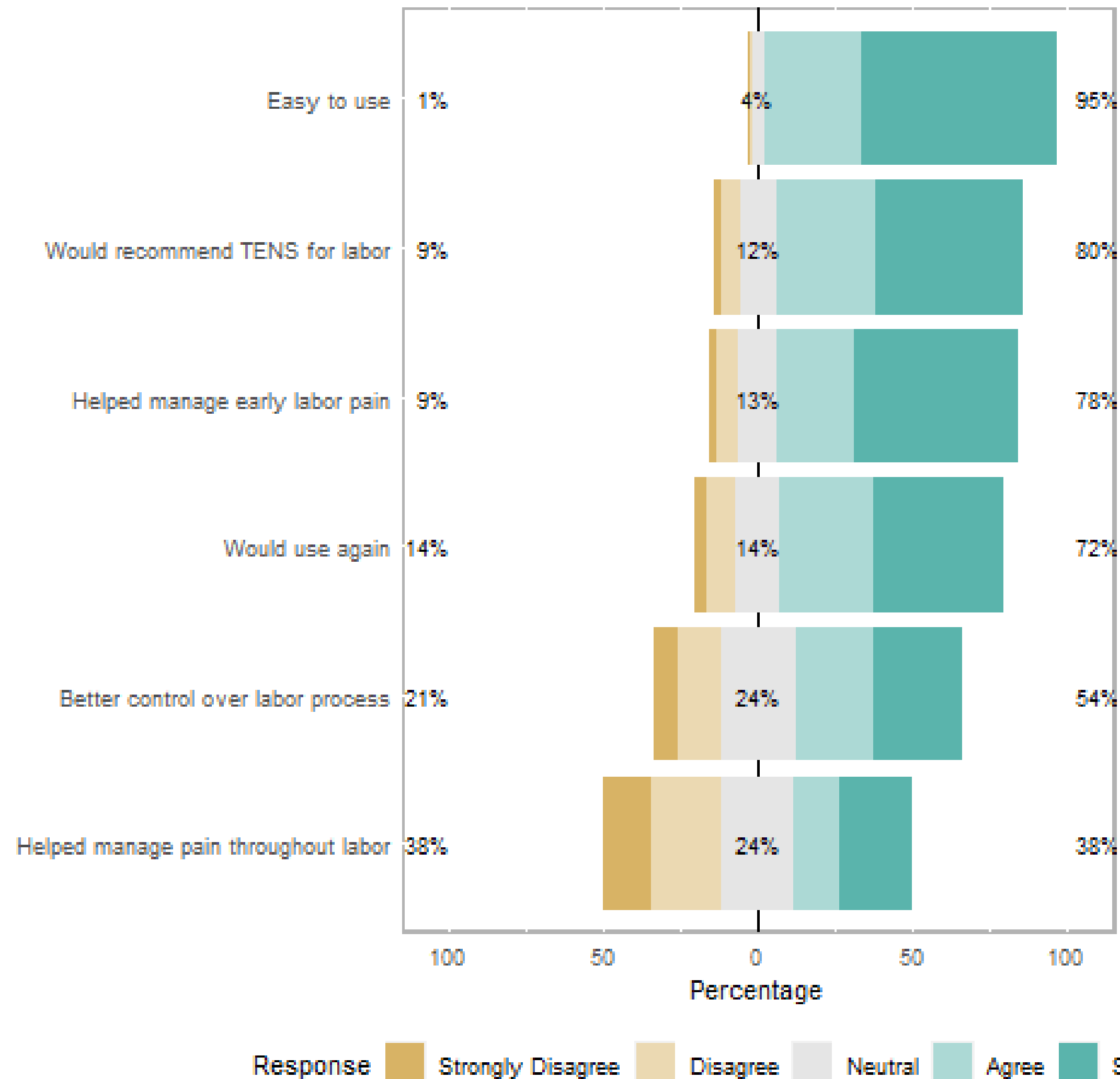
Participant Dispositions

- Participants N = 272
- 47% Sent Home with TENS
- 41% Walked 2 hours before admission to L&D
- 12% Initiated TENS in Labor & Delivery unit



Satisfaction Survey Results

Post-satisfaction survey completion - 94% (255/272)



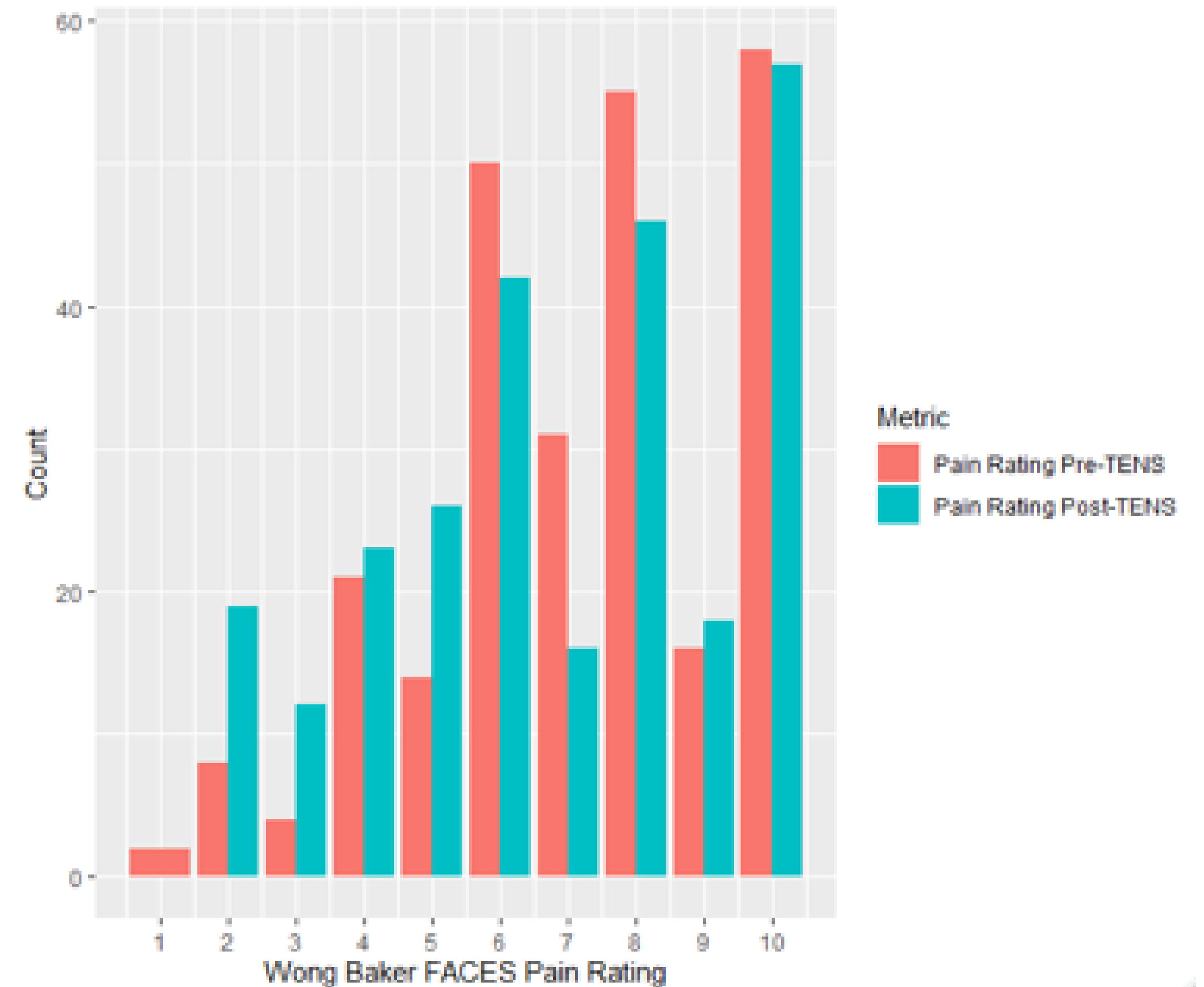
- **Easy to apply - 95% agreed / strongly agreed**
- **Helped manage early labor pain – 78% agreed / strongly agreed**
- **Would use again – 72% agreed / strongly agreed**
- **Would recommend TENS in early labor – 80% agreed / strongly agreed**

Pain Score Results

97% Participants completed Wong-Baker Faces pain scale

- Average pain prior to application: 7.1
- Two-hours post TENS application: 6.74
- Statistically significant decrease in self-assessed pain 0.50 ($p = 0.02$, 95% CI = 0.00004, 1.00005)

Mann-Whitney U-test $p=0.019$ (95% CI 0.00004, 1.00005)



Study Outcomes

Delivery Mode

- **88% (238/272) delivered vaginally**
- **12% (32/272) Primary Cesarean**

NICU Admissions

- **6% (16/272) admitted to NICU**

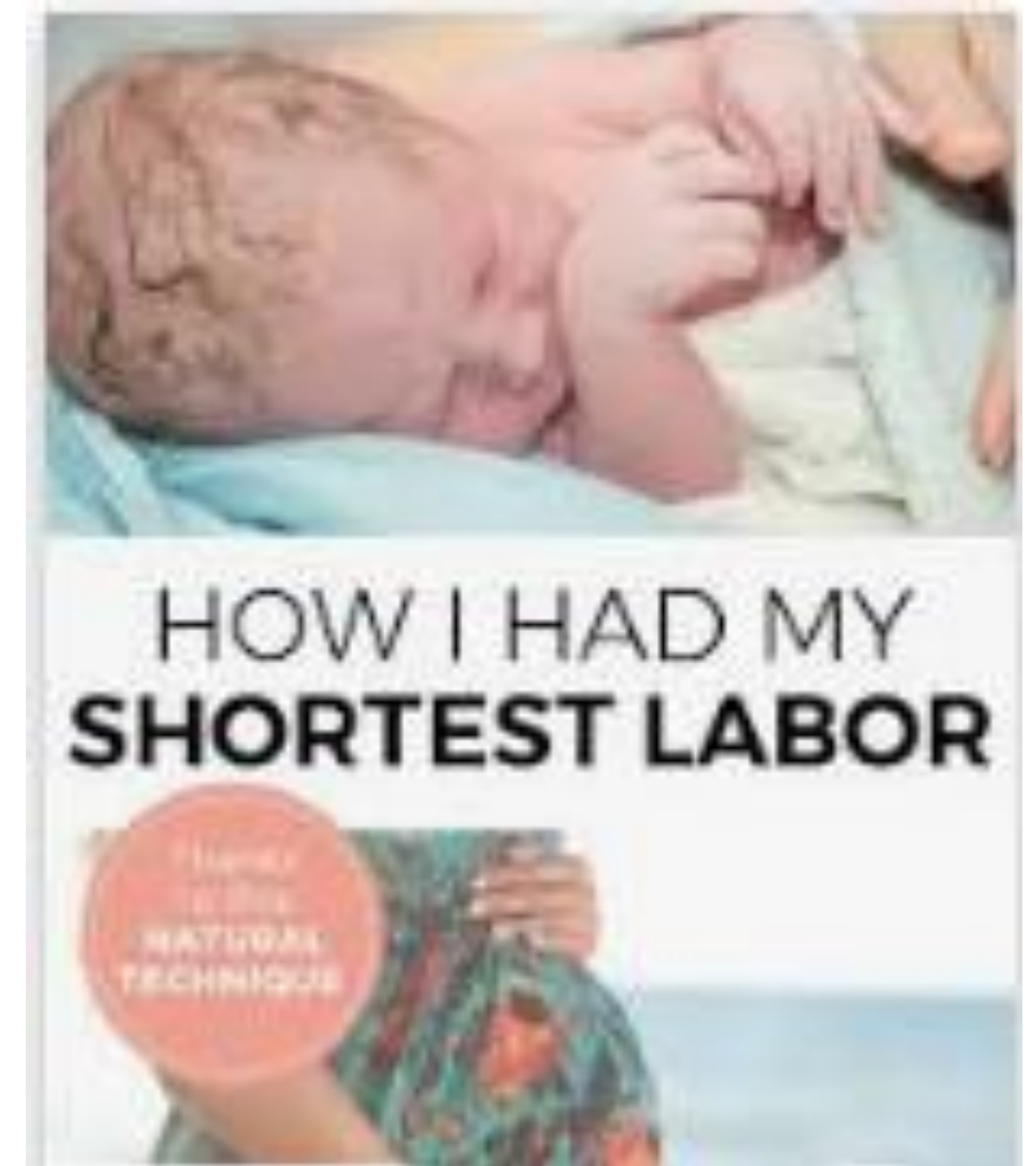


Labor Duration

In hospital – 1st stage labor duration*

- **Women sent home with TENS - 562 min (9 hours)**
- **Women sent walking 2 hours - 616 min (10 hours)**
- **Women receiving TENS in L&D - 792 min (13 hours)**

*p = 0.048



Comparing Outcomes

TENS Participants (5/1/17 – 9/30/20)

- **Unplanned Cesarean Delivery
32/270 (11.8%)**
- **Admissions to NICU:
16 (5.9%)**

TENS – Eligible Participants (5/1/17 – 9/30/20)

- **Unplanned Cesarean Delivery:
1018/6170 (16.5%)**
- **Admissions to NICU 721/6203
(11.6%)**



Nursing Implications

- **A safe, low-cost option to manage early labor pain/discomforts**
- **Aids laboring women to remain active**
- **Reduced in hospital first stage labor time**
 - **Labor productivity**
 - **Potential cost savings**
- **Nursing has a critical role in research**



Limitations

- **Efficacy of TENS for pain throughout labor**
- **Pain perception is individual, unique and difficult to generalize**
- **No control group**
- **Nulliparous population**
- **Recruitment**





TENS provides a safe, low intervention approach to help women reach their goal of a fulfilling labor experience.



**Marilyn Sherman
Jennifer Hogan
Jennifer Piaskowski
Cheryl Swift
Caroline Hu**

**And all the Obstetric Triage Nurses at Christiana Care
who worked with us on this project**



Questions

