Health Disparities in Obstetrical Care Before and After Implementation of an Enhanced Recovery After Surgery Protocol (ERAS)

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- Enhanced Recovery After Surgery (ERAS) is a standardized and multidisciplinary perioperative care pathway that aims to optimize the quality of care for all patients.[1]
- Racial and ethnic disparities have been extensively reported in obstetrical care and are known to affect maternal morbidity and postoperative outcomes.[2] However, race is not generally monitored in ERAS programs.[3]
- Studies that have reported on adherence rates are mainly limited to opioid use and do not capture all program elements.[4]
- Our aim was to evaluate racial and ethnic differences in ***adherence rates to ERAS protocol elements*** and how this might affect disparities.

ERAS Protocol Elements[1]

Pre-Op	Intra-Op	Post-Op
1. Limit fasting interval 2. Nonparticulate liquid carbohydrate loading 3. Patient education 4. Lactation/ breastfeeding preparation and education 5. Hemoglobin optimization	1. Prevent spinal anesthesia-induced hypotension 2. Maintain normothermia ← 3. Optimal uterotonic administration 4. Antibiotic prophylaxis 5. IONV/PONV prophylaxis ← 6. Initial multimodal analgesia ← 7.Promote breastfeeding and maternal-infant bonding 8. Intravenous fluid optimization 9. Delayed umbilical cord clamping	1. Early oral intake 2. Early mobilization 3. Promotion of resting periods 4. Early urinary catheter removal 5. Venous thromboembolism prophylaxis 6. Facilitate early discharge 7. Anemia remediation 8. Breastfeeding support 9. Multimodal analgesia 10. Glycemic control

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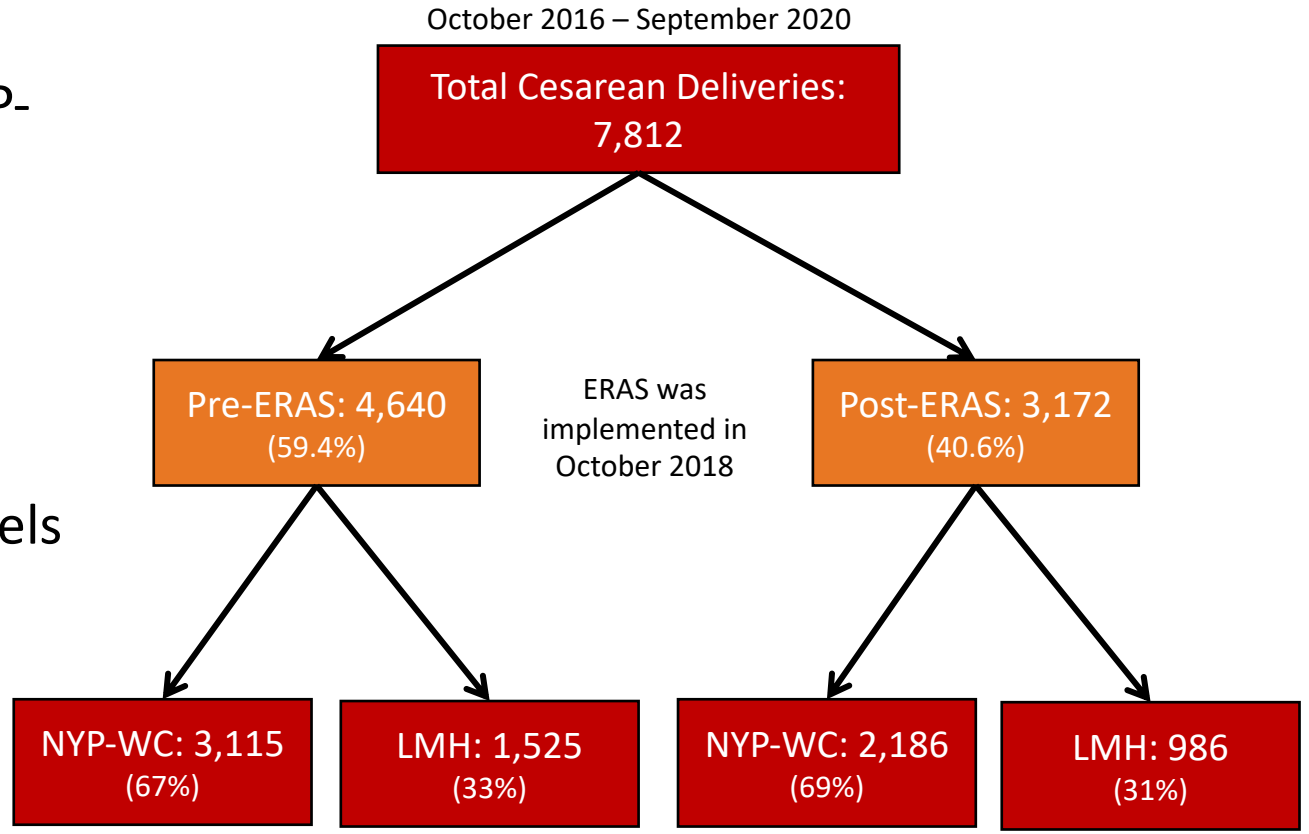
- Retrospective observational study
- Sites: NewYork Presbyterian-Weill Cornell (NYP-WC) and Lower Manhattan Hospital (LMH)
- Inclusion criteria: all adult cesarean delivery procedures (age ≥ 18)
- Data: EPIC with integrated EMR/AIMS system linking pre-, peri-, and post-operative data
- Separate multivariable logistic regression models were created for the following:
  - Overall ERAS-CD adherence
  - Individual element adherence:
    - Ketorolac
    - Ondansetron
    - Warming fluids
- Interaction models: used to test for effect modifications between race/ethnic status and pre- and post-ERAS implementation time periods



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	Overall Adherence		Ketorolac Administration		Ondansetron Administration		Warming Fluid Administration	
Characteristic	aOR (95% CI)	p-value	aOR (95% CI)	p-value	aOR (95% CI)	p-value	aOR (95% CI)	p-value
Race								
White	—		—		—		—	
Asian	0.86 (0.74-1.0)	0.063	0.90 (0.78-1.0)	0.15	0.96 (0.79-1.2)	0.67	0.82 (0.68-0.99)	**0.040**
Black/African American	0.95 (0.74-1.2)	0.67	0.64 (0.52-0.79)	**<0.001**	0.83 (0.63-1.1)	0.20	1.2 (0.94-1.6)	0.12
Declined	1.0 (0.88-1.2)	0.75	0.95 (0.81-1.1)	0.48	0.78 (0.64-0.94)	**0.009**	1.1 (0.87-1.3)	0.59
Other	1.1 (0.74-1.5)	0.78	0.89 (0.64-1.2)	0.48	0.96 (0.63-1.5)	0.87	0.94 (0.58-1.5)	0.79
Pre/Post ERAS Implementation								
Pre-ERAS	—		—		—		—	
Post-ERAS	3.6 (3.2-4.0)	**<0.001**	1.5 (1.4-1.7)	**<0.001**	2.2 (1.8-2.5)	**<0.001**	1.8 (1.5-2.0)	**<0.001**
SDI Quintile								
1st	—		—		—		—	
2nd	1.2 (1.1-1.5)	**0.005**	0.95 (0.82-1.1)	0.53	0.91 (0.74-1.1)	0.37	1.0 (0.83-1.3)	0.82
3rd	1.2 (1.0-1.4)	**0.047**	0.88 (0.74-1.0)	0.12	0.71 (0.57-0.88)	**0.002**	1.3 (1.0-1.6)	0.031
4th	0.98 (0.81-1.2)	0.85	0.82 (0.69-0.97)	**0.024**	0.80 (0.64-1.0)	0.065	1.1 (0.87-1.4)	0.41
5th	0.91 (0.73-1.1)	0.40	0.80 (0.66-0.98)	**0.029**	0.95 (0.73-1.2)	0.71	1.0 (0.78-1.3)	0.90

Results show aOR of ERAS adherence and adherence to specific ERAS elements between racial/ethnic groups, pre-post groups, and social deprivation indices (SDI) without the interaction term. Similar results were seen in the interaction models.

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- Black women had significantly decreased odds of receiving Ketorolac for pain management compared to white women in models with and without the interaction term.
- Asian women had significantly decreased odds of receiving warming fluids compared to white women. Additionally, Asian patients in the post-ERAS group had significantly increased odds of receiving warming fluids compared to Asian patients in the pre-ERAS group.
- ERAS compliance rates to the protocol overall did not differ by race.
- Odds of Ondansetron administration did not differ by race.*
- If appropriately implemented and adhered to by all physicians and healthcare personnel, the ERAS program may provide a practical approach to reducing disparities in processes, outcomes and ensuring equal and equitable treatment for all patients.

Potential Limitations			
We did not use a standardized quality of life score • Ex: the Obstetric Quality of Recovery-10 Instrument (ObsQoR-11)	Pre-, post-ERAS study design → unable to distinguish association from causation • Baseline population differences • Residual confounding • Institutional practice changes during the study period	Healthcare documentation varies by provider → hard to acquire complete data for protocol adherence assessments	ERAS implementation may differ in other settings depending on their methodologies • Different surgical practice models • Different performance improvement methods

*Odds of Ondansetron administration differed in the "declined" group.

1. Bollag et al. Anesth Analg. 2021. 132(5):1362-77.
2. Tangel et al. Am J Perinatol. 2019;36(8):835-48
3. Sviggum et al. Patient Safety in Anesthesia. 2024;14:121–30.
4. Matthews et al. Am J Perinatol. 2022.

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