

Budget Impact Analysis of Intravenous Acetaminophen in Neonates after Esophageal Atresia and Tracheoesophageal Fistula Repair

Michael A. Phillipi, BA¹, Ashley Y. Song, MPH, PhD², Leah Yieh, MD, MPH³, Cynthia Gong, PharmD, PhD⁴

1 - School of Medicine, California University of Science and Medicine, Colton, CA
2 - Bloomberg School of Public Health, Johns Hopkins University, Baltimore, MD
3 - Department of Clinical Science, Kaiser Permanente Bernard J. Tyson School of Medicine, Pasadena, CA
4 - Keck School of Medicine, University of Southern California, Los Angeles, CA

Introduction

- Over the last decade, intravenous acetaminophen (IV APAP) has gained popularity as a safe and effective first-line analgesic in the neonatal intensive care unit (NICU), despite costing nearly 17 times more than the oral formulation
- Objective: compare the budget impact of IV APAP in combination with opioids versus opioids alone as a pain management strategy after neonatal esophageal atresia (EA) and tracheoesophageal fistula (TEF) repair

Methods

- Design: Decision-analytic model (Figure 1)
- Population: Theoretical cohort of 974 neonates who underwent EA/TEF repair
- Comparators: post-operative pain management with opioids alone vs. opioids and IV APAP
- Perspective: Health care
- Model inputs were derived from the literature and Pediatric Health Information System (PHIS)
- Costs were converted to 2023 U.S. dollars using the U.S. Medical Consumer Price Index
- Base case and sensitivity analyses were performed (Figure 2)

Results

- Base case: the use of IV APAP in addition to opioids after EA/TEF repair increased the average costs per patient by \$212,025 from \$551,903 (opioids-only) to \$763,929 (opioids + IV APAP)
- Opioids + IV APAP group experienced a longer average length-of-stay (LOS) of 69.6 days compared to 52.0 days in the control group
- Opioids + IV APAP group also had a longer average time spent on total parenteral nutrition, averaging 64.3 days to the opioids-only group's 31.8 days
- Mortality rate in the opioids + IV APAP group was 4.5%, far lower than the 20.7% rate in the opioids-only group (Figure 3)
- Treatment of all (approximately 850) neonates diagnosed with EA/TEF each year in the United States with IV APAP would result in increased hospital costs of over \$180 million annually as compared to the treatment with only opioids
- Use of IV APAP would result in 138 fewer infant mortalities (38 vs 176), corresponding to approximately \$1.3 million in increased hospital costs per one less death

Discussion

- Using IV APAP alongside opioids in EA/TEF repair increases costs, use of total parenteral nutrition, and LOS
- Despite its association with an increase in healthcare utilization, our findings suggest IV APAP provides a mortality benefit to neonates

Contact information: phillipim@cusm.org, (503) 320-2898

Intravenous acetaminophen in neonates after esophageal atresia and tracheoesophageal fistula repair increases costs by \$212,025 but provides a mortality benefit

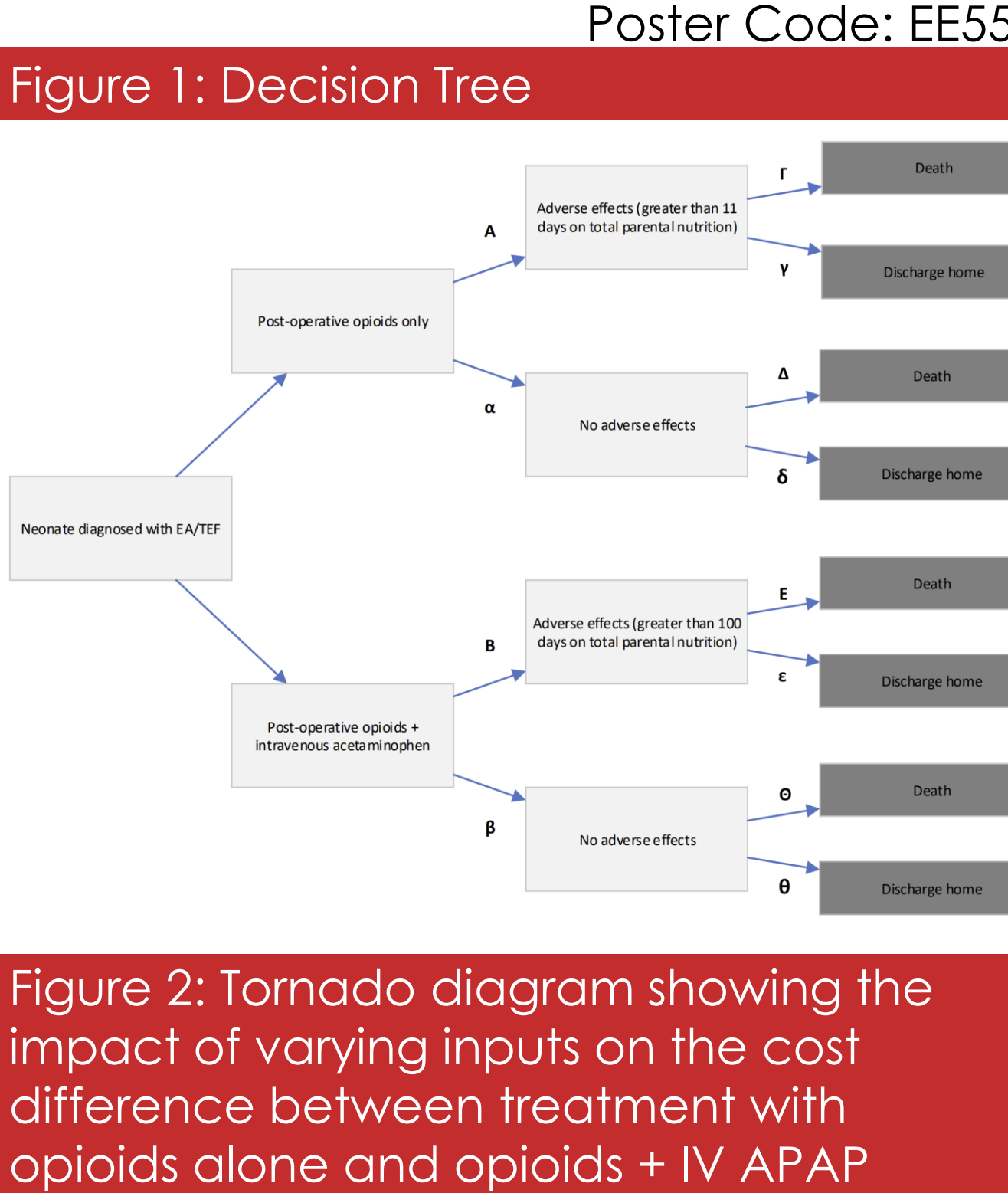


Figure 3: Patient outcomes

	Opioids Only	Opioids + IV APAP	Absolute Difference (Opioids Only – Opioids + IV APAP)	Relative Difference, %
Base Case Cost Per Patient	\$551,903.42	\$763,928.69	-\$212,025.26	-27.8%
Average Total Parenteral Nutrition Days on Service	31.8 days	64.3 days	-32.5 days	-50.5%
Average Hospital Length-of-Stay	52.0 days	69.6 days	-17.6 days	-25.3%
Average Daily Total Patient Costs	\$4,930.19	\$4,619.65	\$310.54	6.7%
Average Pharmacy Charges	\$65,165.81	\$89,074.99	-\$23,909.17	-26.8%
Mortality Rate	20.7%	4.5%	16.1%	358.4%



California University of Science and Medicine
SCHOOL OF MEDICINE



Keck School of Medicine of USC