Cost effectiveness analysis of a pharmacist-led clinical decision support system to reduce drug-associated acute kidney injury in the adult non-intensive care setting

EE225

Stottlemyer BA[1], Smith KJ[2], Lukan CJ[1], Ozrazgat-Baslanti T[3,4], Bihorac A[3,4], Kane-Gill SL[1,5], for the MEnD-AKI Study Group

[1]Department of Pharmacy and Therapeutics, University of Pittsburgh, [2]Department of Medicine, University of Pittsburgh, [3]University of Florida Intelligent Clinical Care Center, [4]Department of Medicine, Division of Nephrology, Hypertension, and Renal Transplantation, University of Florida, [5]Department of Critical Care Medicine, University of Pittsburgh

INTRODUCTION

- Medications may contribute to the development and progression of acute kidney injury (AKI) and increase adverse drug event (ADE) risk
- Nephrotoxin stewardship strategies can promote kidney health by preventing drug-associated AKI (D-AKI) and reducing its severity, however the potential cost benefits associated with targeted programs are unclear
- Objective: to evaluate the cost-effectiveness of the "Multi-hospital Electronic Decision Support System for Drug-associated AKI" (MEnD-AKI) clinical trial intervention to reduce the risk and progression of D-AKI

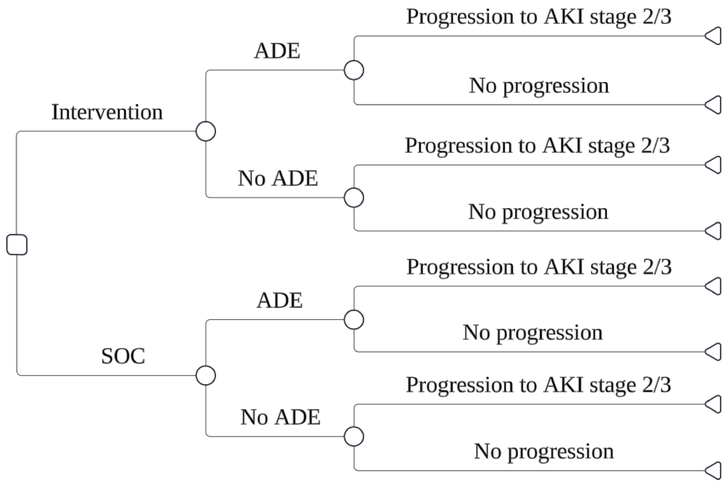
METHODS

- Decision-analytic tree model with a 30-day time horizon

Outcomes of Interest	Clinical Data	Economic Data
ADE and AKI progression during hospitalization	MEnD-AKI preliminary results (8 hospital sites)	Relevant published literature

- One-way and probabilistic sensitivity analyses were conducted to assess the robustness of model predictions

MODEL STRUCTURE



ADE=adverse drug event, AKI=acute kidney injury, SOC=standard of care

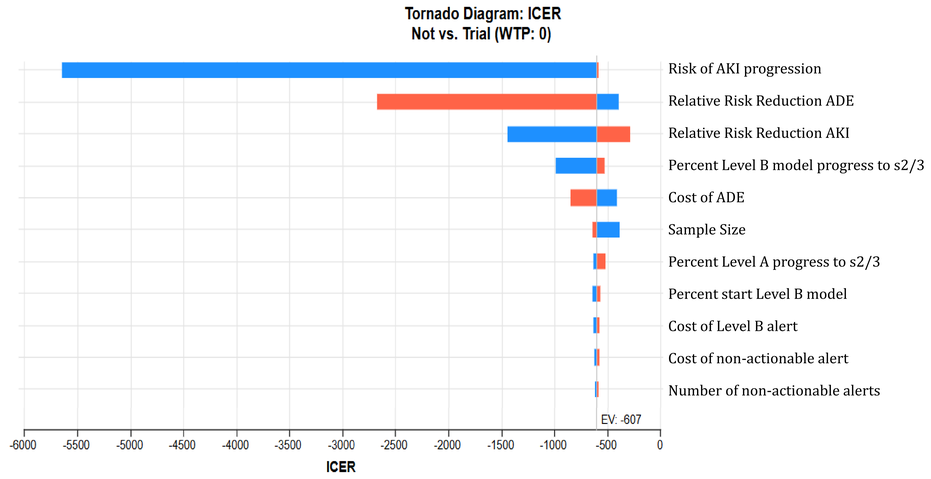
RESULTS

Cost Effectiveness Analysis of MEnD-AKI Intervention vs Standard of Care (Effectiveness = AKI progression risk)

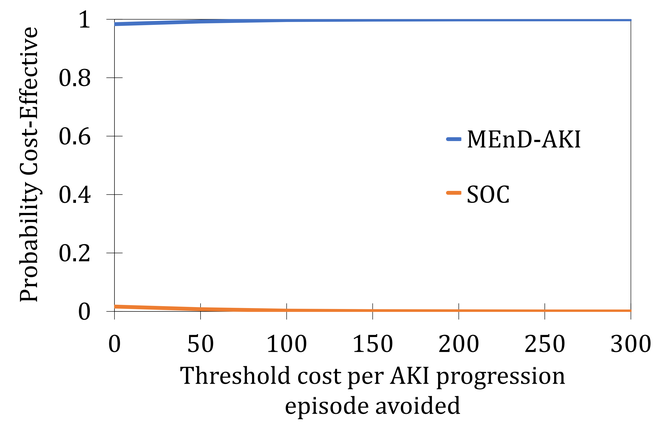
Strategy	Average Patient Cost	Incremental Cost	Effectiveness	Incremental Effectiveness	ICER
MEnD-AKI	$492.72		29.9%		
SOC	$549.38	$56.66	39.2%	9.3%	Dominated

MEnD-AKI intervention provided short-term health benefits, reducing the percent of patients progressing to AKI stage 2 or 3 from 39.2% to 29.9%. Results remained favorable in sensitivity analyses, with cost savings seen in >98% of model iterations.

One-way Sensitivity Analysis



Probabilistic Sensitivity Analysis



ADE=adverse drug event, AKI=acute kidney injury, ICER=incremental cost effectiveness ratio, s=stage, SOC=standard of care, WTP=willingness to pay.

LIMITATIONS

- Economic model is based on preliminary results of a clinical trial so cost-effectiveness of intervention may differ once the trial is completed
- Initial startup information technology (IT) development and training costs in our assessment may differ between institutions based on the robustness of the IT platform
- Model assumed a single AKI episode per patient and did not account for readmissions
- Analyses only considered a health-system perspective

CONCLUSIONS

- MEnD-AKI shows promise as a cost-effective nephrotoxic stewardship program to reduce the risk and progression of D-AKI in hospitalized non-intensive care patients
- Automated alerts and pharmacist guidance, as part of a clinical decision support system, could significantly improve risk assessment, medication use, and drug dosing for patients with or at risk of AKI

NIH NIDDK: R01 DK121730