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Developing an Automated Procedural Scheduling Tool for Ambulatory Gastroenterology Procedures

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Objectives

- Illustrate the potential cost savings and benefits of an automated scheduling tool for procedural scheduling.
- Discuss the methods employed in establishing an automated procedural scheduling process.

Background

- Existing logistical challenges with patient scheduling exacerbated during transition from conscious sedation to propofol sedation provided by anesthesia in July 2021 for ambulatory gastroenterology procedures at UCHealth University of Colorado Hospital
- Underwent iterative process of developing screening tools to ensure patients appropriately triaged according to sedation risk
- Triage initially performed by clinical nursing staff who communicated recommendation to non-clinical schedulers; was a highly subjective and time-consuming process
- Questionnaire and decision tree developed to allow non-clinical scheduling staff to manually perform focused screening of patients to determine appropriate level of sedation
- Length of questionnaire and inaccuracy of patient responses indicated the need for an automated and less subjective process
- Partnered with Electronic Health Record (EHR) analysts to create report that extracted information from patient's chart to answer survey questions. Used binary system (0 or 1) to score each question and generate patient specific score that represents sedation risk level

Purpose

- Improve efficiency in scheduling process
- Leverage existing information in patient EHR to increase accuracy in risk assessment and room triage
- Decrease staffing requirements by eliminating the need for manual triaging for the majority of patients
- Reduction of costs associated with patient triage and procedure scheduling



Speaker Contact Information

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Methods

 Tool reviews >90 separate components of patient's EHR, assessing for cardiac and pulmonary disease history, kidney and liver function, medications, and Body Mass Index

- Tool generates score for hundreds of patients instantaneously
- Patients with lower scores are assumed to have fewer comorbidities, posing less risk for anesthesia complications. Patients lacking recent documentation require manual triage
- Scores 0-10: fast tracked to scheduling hub where non-clinical personnel schedule them without requiring clinical review; 65% meet this criteria
- Scores >10: sent to a nurse navigator, who utilizes itemized report to quickly identify items responsible for higher score and determine if patient is appropriate for propofol sedation

Outcomes

- Tool has allowed scheduling team to screen high volume of patients, reducing overall scheduling time by 75%
- 98% scheduling accuracy rate
- Non-clinical staff utilizing tool to accurately, safely, efficiently schedule patients for multiple disciplines across UCHealth system
- Significant reduction in sedation related adverse events
- Estimated \$910,000 additional annual revenue due to reduction in cancellations and increased block utilization
- Elimination of manual nurse triage results in projected annual cost savings of >\$90,000.

Discussion

- Tool continues to evolve through collaboration with anesthesia department members and analysis of quality of care events
- Success of project has led to implementation of automated triage tool in other procedural areas throughout UCHealth system
- How could the process be improved?
 - Earlier identification of dedicated anesthesia team
 - Increased collaboration in development of tool criteria
 - Enhanced preprocedural documentation of patient comorbidities
 - Collection of robust pre-procedure data to better understand impact of change

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Cardiac					Social/Demographic/Sleep					Renal/Endocrine/Hematologic						
Inquiry	Respor	nse Action		Room Type		Inquiry	Respon	se A	Action	Room	туре	Inqu	liry	Response	Action	Room Type
	No	No Schedule Anywhere		Okay for MAC	Height and Weight		BMI < 45	Schedule Anywhere	2	MAC				No	Schedule Anywhere	MAC
Chest pains, heart palpitations or shortnes of breath?	Yes Call RN, Schedule Pre Proce		edure Visit	na			BMI > 45	Chart Review/Exclud	de from ASC	Genera	al	Dialysis		Yes	Chart Review, Exclude from ASC	?
Chest pains, heart palpitations or shortness of breath?	ess Treatment Needed Urgent Issue Triage to ED Patient is Stable Chart Review						No	Schedule Anywhere	9	MAC				No	Schedule Anywhere	MAC
				na	Pregnant		Yes	Chart Review/Exclud	de from ASC	Genera	al	Diabetes		Yes	Chart Review	?
				na	DNR Directive		No	Schedule Anywhere	2	MAC				Νο	Schedule Anywhere	MAC
				MAC			Yes	Exclude from ASC				Diabetes, Insulin Depe	iabetes, Insulin Dependent		Chart Review	
Defibrillator	No Schedule Anywhere			MAC Family Member or Power (r Power of Attorney	No	Schedule Anywhere		MAC				No	Schedule Anywhere	MAC
	Yes Chart Review (interrogation report)/Exclude na			lude na	Consent		Yes	Yes Chart Review				Diabetes, Insulin Dependent, HgA1c level >		9 Yes	Exclude from ASC, preferably before 10AM	General Room
FF < 30	No Chart Review N Yes Pre Procedure Consult 0		MAC	AC		No	Schedule Anywhere	re MAC					No	Schodulo Anywhore		
				General	wheelchair frans	/neelchair Transfer Assistance		Yes Chart Review/Exclude from ASC General		al	Anemia or Low Platelet Count					
Pacemaker	No Schedule Anywhere Yes Chart Review No Schedule Anywhere		MAC				Hepatologic/Neurologic/Pulmonary					Yes	Chart Review	na		
				History of Alcoh		or Illicit Drug Abuse		Inqui	iry	Response	A	<mark>رک</mark>		No	Schedule Anywhere	MAC
				MAC	MAC		Yes	Cirrhosis of the Liver		No	Schedule Anywhere	Anemia or Low Platele	: Count, Platelets < 5	0 Yes	Receive Treatment prior to Procedure,	?
> 40% beats Pacemaker				ardiac	Coming From a Facility (Assisted Living,		No		Yes	Chart Review			No	Schedule Anywhere	MAC	
Abnormal Heart Rhythm	rmal Heart Bhythm		Response	Schedule Anywhe	Actio		Yes No	Yes Cirrhosis of the Liver, Decompensated		No	Schedule Anywhere Exclude from ASC, C	Anemia or Low Platelet Count, Hgb <		Yes	Receive Treatment prior to Procedure, Exclude from ASC	?
C	Congenital Heart Disease/Decompensated		Ves	Exclude from ASC	Sleep Apnea		Yes		No	steps Schedule Apywhere			No	Schedule Anywhere	MAC	
	Heart attack or Stent Placed		No	Schedule Anywhe			No	No Neuromuscular Disease		Ves	Chart Review/Exclus	Blood Clot, Legs or Lungs		Yes	Chart Review	na
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			months	Chart Review/Exc	view/Exclude frd Sleep Apnea/CPAP use/AHI			AHI > 30		>1 year			Blood Clot, Legs or Lun	gs, Last Event	t Exclude from ASC s	?
Congenital Heart Disease	Valve heart disease diagnosis		No	Schedule Anywhe	here MAC CHO Report)		History of Seizures: Last Seizure		ago	Schedule Anywhere	_		< 3 months	Only schedule if urgent, Exclude from ASC	General Room	
			Yes	Chart Review (EC					ago	Exclude from ASC	_		No	Schedule Anywhere	MAC	
	Valve heart disease diagnosis/ ECHO Report		Mild	Schedule Anywhe	ere	MAC			< 1 month ago	Exclude from ASC, P	re Bleeding Disorder		Yes	Chart Review/Pre Procedure Visit	?	
			osis/ ECHO Report Moderate > 4 Mets Schedule Anywhe Moderate < 4 Mets or Exclude from ASC		re MAC /PPS Review na		Stroke or Transient Ischemic Attack (No	Schedule Anywhere			No	Schedule Anywhere	MAC
									emic Attack (TIA)	Yes	Chart Review	Blood Thinners		Yes	Chart Review/Pre Procedure Visit	?
			unknown						> 9 months	Schedule Anywhere		MAC				
			Severe	Exclude from ASC	/PPS review	na	Recent Stroke or Transient Ischemic Attack (TIA)		ago < 9 months	Suggest postponeme	ent for elective, Exclude					
				Schedule Anywhere		MAC	-			ago	from ASC, urgent on	ly	?			
	Treated for Hypertension/ED visit to treat High Blood Pressure Pulmonary Hypertension		months, no		MAC		Difficult Airway			No	Schedule Anywhere	MAC ?				
			Last 12 months yes	ast 12 Exclude from ASC/Refer to PCP		?			Yes	Exclude from ASC						
			No Schedule Anywhere		e MAC			Supplemental Oxygen d	ntal Oxygen during the Day	No	Schedule Anywhere		MAC			
									Yes	Chart Review		na				
			symptoms with Exercis	symptoms Chart Review with Exercise		?		Supplemental Oxygen during the		< 2 Liters	Schedule Anywhere		MAC			
			Symptoms	Schedule Anywhe	edule Anywhere?		Rate			> 2 Liters	Exclude from ASC	clude from ASC ?				
			with Exercis	Exercise												

Scoring Tool Reference Spreadsheet

EMR Based Scoring Tool Example

601	GI Score (Metro)	704	GI Score (Metro)
	- Score calculated: 2,	701	
	06:55		
~		0	Pregnant
0	Pregnant	0	DNR
0	DNK	0	BMI > 45
0	BMI > 45	0	Gastroparesis
0	Gastroparesis	0	Ejection Fraction < 40%
0	Ejection Fraction < 40%	0	Allergy to Propofol or Suc
0	Allergy to Propotol or Succinvicnoline	0	Takes Select Pulmonary H
0	Takes Select Pulmonary HTN Med	500	Insulin-Dependent Diabe
500	Insulin-Dependent Diabetes (Metro)	0	Peripheral Neuropathy
0	Penpheral Neuropathy	0	High A1C (greater than 8.5
0	High A1C (greater than 8.5%)	0	Tracheostomy
0	Tracheostomy	0	Esophagectomy or Esopha
0	Esophagectomy or Esophageal Cancer	0	Cardiac Device
0	Cardiac Device	0	Bleeding Disorder
0	Bleeding Disorder	100	DVT or PE
0	DVT or PE	100	Sleep Apnea & CPAP
0	Sleep Apnea & CPAP	0	Daytime Oxygen Depende
0	Daytime Oxygen Dependence	0	Pulmonary Hypertension
0	Pulmonary Hypertension	0	Neuromuscular Disease
0	Neuromuscular Disease	0	Seizure Disorder
0	Seizure Disorder	0	Developmental Delay
0	Developmental Delay	0	Dialysis Dependence
0	Dialysis Dependence	0	Anemia and Platelets < 50
0	Anemia and Platelets < 50	0	Anemia and Hemoglobin
100	Anemia and Hemoglobin < 9	0	Cardiac Stent or Heart Atta
0	Cardiac Stent or Heart Attack	0	Cardiac Valve Disease
0	Cardiac Valve Disease	0	Chest Pain or Angina
0	Chest Pain or Angina	0	Congenital Heart Disease
0	Congenital Heart Disease	0	Dysrhythmia
0	Dysrhythmia		Treatment for Hypertens
0	Treatment for Hypertension or Recent ED	1	for Hypertension
8	Hypertension	0	Difficult Airway
0	Difficult Airway	0	Shortness of Breath
0	Shortness of Breath	0	Dementia
0	Dementia	0	Stroke or TIA
0	Stroke or TIA	0	Cirrhosis
0	Cirrhosis	0	Anticoagulant
1	Anticoagulant	0	Alcohol or Drug Use
0	Alcohol or Drug Use	0	Wheelchair Bound
0	Wheelchair Bound	0	40 < BMI < 45
0	40 < BMI < 45		

e (Metro)	203	GI Score (Metro)	602	GI Score (Metro)
	LUJ			
ant	0	Pregnant	0	Pregnant
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45	0	BMI > 45	0	BMI > 45
oparesis	0	Gastroparesis	0	Gastroparesis
on Fraction < 40%	0	Ejection Fraction < 40%	0	Ejection Fraction < 409
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n-Dependent Diabetes (Metro)	0	Insulin-Dependent Diabetes (Metro)	500	Insulin-Dependent Di
veral Neuropathy	0	Peripheral Neuropathy	0	Peripheral Neuropathy
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eostomy	0	Tracheostomy	0	Tracheostomy
agectomy or Esophageal Cancer	0	Esophagectomy or Esophageal Cancer	0	Esophagectomy or Eso
ic Device	0	Cardiac Device	0	Cardiac Device
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or PE	100	DVT or PE	0	DVT or PE
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Disease	0	Congenital Heart Disease
	1	Dysrhythmia
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	0	Difficult Airway
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	0	Stroke or TIA
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