



Implementation of Patient Scoring and Documentation within an EMR to Improve Patient Safety

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The speakers have no actual or potential conflicts of interest to disclose.


Objectives



Identify four types of patient scoring tools that can improve patient safety in the inpatient setting.



Explain when documentation is needed within an EMR to facilitate communication and handoff among all healthcare professionals.



Discuss what appropriate actions a pharmacist should take when a patient has a score flag within the EMR.



Background

- Nearly 5% of hospitalized patients experience an adverse event
- 7,000 to 9,000 deaths per year as a result of medication errors
- The involvement of pharmacists in the medication use process improves quality and reduces medication errors

Practice Site Demographics

- Academic Medical Center
 - 7 hospitals
- Columbus, OH
- Level 1 Trauma Center
- 1,517 Beds
- Patient Admissions (FY19)
 - 64,534
- Outpatient Visits (FY19)
 - 1.92 million



Ohio State Credentialing and Privileging



Collaborative practice through a formalized consult agreement allows for an expanded scope of practice

Pharmacists' scope of practice is now standardized

Residents are also able to apply for credentialing and privileging

Ultimate goal: enabling proactive medication management

History of Prioritized Scoring Tool

- Despite the implementation of an EMR, management of pharmacokinetically monitored medications was conducted using a paper monitoring form
- Potential for transcription errors
- Initial efforts for a patient scoring system based on pharmacokinetics scoring module
 - Designed for the function of dosing management, searching throughout the EMR and concisely displaying the information needed to make a clinical decision
 - Reduced the time to intervention from hours to minutes

What is Patient Scoring at Ohio State?

- Patient prioritization tool integrated into the EHR
- Generates “scores” based on clinical parameters and rules
- Facilitates more rapid clinical interventions
- Pharmacists check off scores when clinical need addressed

Four areas of patient scoring



Kinetics



Renal



Anticoagulation



Antimicrobial

What Do Scores Mean?

500 Points

- Almost always requires clinical intervention
- Progress note *required*

50 Points

- Likely requires clinical intervention

5 Points

- May or may not require clinical intervention

Kinetics



- 500 Points
 - Drug* level result in past 24 hours
- 50 Points
 - Drug* level ordered, not yet resulted
- 5 Points
 - Drug* currently ordered

*vancomycin, gentamicin, amikacin, tobramycin, streptomycin



Renal



- 500 Points
 - New start hemodialysis, peritoneal dialysis, or CRRT
 - CRRT recently stopped (within past 12 hours)
- 50 Points
 - Drug* dosing + CrCl does not match pharmacy guidelines
 - Vancomycin + SCr increase of 50% or 0.3 in last 72hr
- 5 points
 - SCr increase by 30% in past 36hr, 72hr
 - SCr decrease by 30% in last 36hr, 72hr

*cefepime, acyclovir, nitrofurantoin, ketorolac, colistin, vancomycin

CRRT: Continuous Renal Replacement Therapy

Anticoagulation



- 500 Points
 - DOAC or enoxaparin order + contraindicated renal parameters
 - INR increase of >0.6 + warfarin
 - Enoxaparin order + resulted anti-Xa level within 24hr
- 50 Points (*not comprehensive list*)
 - Warfarin + no INR in last 3 days
 - Concomitant antiplatelets and/or anticoagulants
 - Pending anti-Xa level
- 5 Points
 - Active warfarin, argatroban, bivalrudin order



Antimicrobial



- 500 Points
 - Patient with *S. Aureus* bacteremia infection
- 50 Points
 - Susceptibilities available on abnormal result from respiratory, blood, or CSF culture
- 5 Points
 - Abnormal result from a respiratory, blood, or CSF culture



Scoring Dashboard

Unit/Room/Bed	Service	Patient Name/Age/Sex	MRN	Rx Action Items Sticky Note	PK Score	PK Score Review	Renal Score	Renal Score Review	Antico Score	Antico Score Review	Antimi Score	Antimi Score Review
K8W-K0871-C	GEN MED 6			04/21 1400 Anti Xa	0	—	0	—	50		5	
KMCU-K0480-K	MED INTENSIVE			04/21 1400 anti-xa level	0	—	5		550		0	—
KSIB-K0460-G	MED INTENSIVE			04/21 1400 vanco 15-20	505		0	—	0	—	0	—
C11C-C1113-A	MED INTENSIVE			04/21 1500 CRRT ordered, adj abx once started...	5		555		0	—	0	—
C11A-C1104-A	MED INTENSIVE			04/21 1500 order tobra levels	5		5		0	—	50	
R11W-R1145U-U	GEN MED 6			04/21 1500 pls ORDER anti-Xa level for 1900 (check MAR...	0	—	0	—	0	—	0	—
C11F-C1136-A	MED INTENSIVE			04/21 1700 CRRT started - adjust antibiotics	5		55		0	—	50	
R9E-R0914-A	GEN MED 4			04/21 1700 vanc trough (prior to 3rd dose; not steady...	55		0	—	0	—	0	—

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Improved Quality of Care for *Staphylococcus aureus* Bacteremia

Department of Pharmacy launched coordinated go-live of patient scoring tool for *Staphylococcus aureus* bacteremia and a 1-hour continuing education lecture session

All clinical pharmacists then received real-time notifications for every blood culture positive for *Staphylococcus aureus* via the patient scoring tool

Retrospective study to evaluate the impact of the automated, pharmacist-driven targeted initiative

Demonstrated a significant improvement in patients receiving an ID consult, targeted antimicrobial therapy, and adherence to all quality-of-care measures

Accordion Reports

- Provides details specific to each scoring system
 - Kinetics Accordion
 - Renal Accordion
 - Anticoagulant Accordion
 - Antimicrobial Accordion
- Can also see the following:
 - Rx Action Items and Handoff Sticky Notes
 - Reason score is generated
 - Score comment



Accordion Reports

24 Hrs: ◀	No department found		R8W		C11C	
	04/15	04/16	04/17	04/18	04/19	04/20
	0000	0000	0000	0000	0000	0000
▼ Anti-infectives						
Acyclovir IV (mg)				2,600+	2,600+	
Ampicillin IJ (g)				8+	8+	
Azithromycin IV (mg)				500		
CefTRIAxone IV (g)			1	4+	4+	2
vancomycin SOLN (mg) (mg)				4,000+	4,000+	4,000+
▼ Vanco/AG Levels						
VANCOMYCIN, TROUGH					19.6	
▼ Antipyrogenics						
Acetaminophen (mg)		650	650			650
Hydrocortisone (mg)		10	20+			
Hydrocortisone Sod Succinate IJ...			100+	50		100+
methyLPREDNISolone Sodium S...				1,000	500	
▼ Weight						
Weight				228.9 kg (50...		
▼ Labs						
WBC		6.81	6.68	7.79	9.58	12.22
Segs + Bands, Absolute		5.51			9.01	10.89
Plts		235	249	212	268	247
PROCALCITONIN						
CK				63		
▼ Renal Function						
BUN		15	16	18	19	21
SCr		0.95	0.89	1.03	1.06	1.17

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Poll Question 1 (Use for Poll)

Does your institution have a scoring dashboard?

- A. Yes
- B. No
- C. Kind of



Poll Question 2 (Use for Poll)

How does your institution document handoff amongst healthcare professionals? Physicians? Pharmacists?



Steering Committee

- Diverse team formed that includes:
 - Clinical pharmacy specialists in various diseases
 - Clinical generalist pharmacists
 - Clinical applications (informatics) pharmacists
 - Pharmacy leaders
- Charged with developing the guiding principles and governance structure for how patient scoring would be designed and implemented
- System should be simple to use and provide visual prompts or cues that could be easily understood
- Determine expectations for pharmacist behavior, including frequency of review and documentation

Goals of Documentation



Facilitate communication and handoff among all healthcare professionals



Improve consistency of documentation within Department of Pharmacy



Elevate practice of pharmacy by making the pharmacist a more visible member of the patient care team



Utilize embedded smart data elements to capture the work that pharmacists do and include this in the productivity model

Types of Documentation

- 5 types of documentation
 - Different purposes for each
 - Consistency across Pharmacy Department essential

Documentation Type	Permanent in Medical Record?	Accessible By
Progress Notes	Yes	All healthcare professionals
Rx Action Items Sticky Note	No	Pharmacy only
Rx Handoff Sticky Note	No	Pharmacy only
Navigators	Yes	Pharmacy only
iVents (rarely used)	Yes	Pharmacy only

Scoring Progress Note Documentation

- Progress note is required for all scores of 500 points
 - This is an expectation on all shifts
 - May also be appropriate for scores <500
- Prebuilt dot phrases exists for each scoring system

Scoring Systems	Smart Phrase
Pharmacokinetics	.rxkinetic
Renal	.rxrenal
Anticoagulation	.rxanticoag
Antimicrobial	.rxasp

Documentation

- Rx Action Items Sticky Note
- Rx Handoff Sticky Note

Rx Action Items Sticky Note
(From admission, onward)
None

Rx Handoff Sticky Note
(From admission, onward)

CC: SOB, leg swelling
Resp: COPD exacerbation per previous admission (04/09-04/18)
> levofloxacin 750 mg x 5 days
> pred 40 mg x 5 days (needs taper)
> pulm consulted (pt not improving on 04/13)
> MS Contin 15 mg BID

PMH: COPD, atrial tach (dofetilide-stopped 03/2020), CAD, depression, OA, blind, HLD, GERD
Med rec: Aligns with fill hx, steroid chronic
ID: COVID neg
Dispo: SNF

None

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Documentation

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Pharmacy Shifts

1st Shift

- Sort by Rx Action Items Sticky Notes to find notes left by other shifts
- Sort by each Score Column and review all patients with a score greater than zero
- Ensure all patients at the end of first shift are "green" and no up arrows

2nd Shift

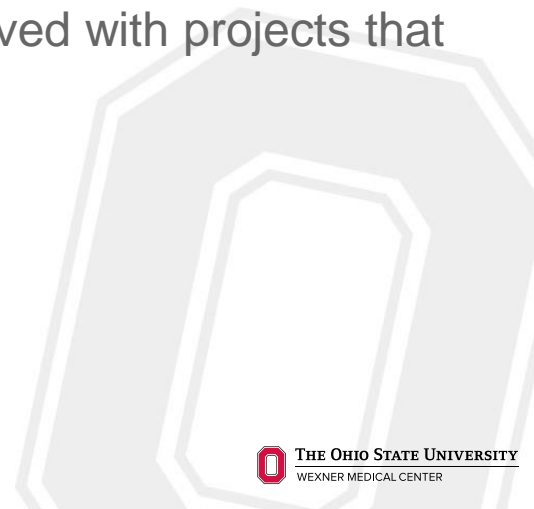
- Sort by Rx Action Items Sticky Note to identify follow-up items
- Look for and evaluate patients with >500 points in any Score Change Column with Up Arrow

3rd Shift

- Sort by Rx Action Items Sticky Note to identify follow-up items
- Look for and evaluate patients with >500 points in any Score Change Column with Up Arrow

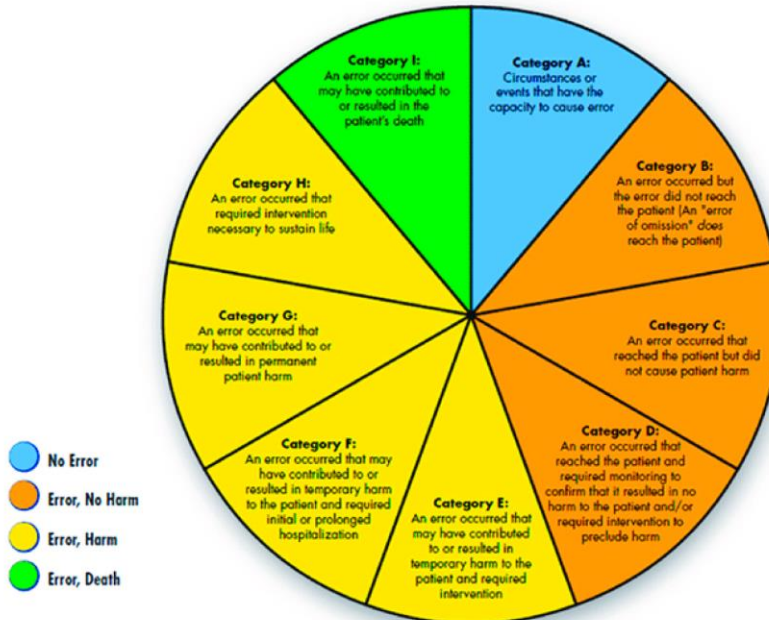
Pharmacy Residents and Patient Safety

- Also trained to perform scoring on weekdays and weekends
- Opportunities for medication safety rotation
- HSPA pharmacy residents help review medication events that are reported through internal system
- Number of opportunities to get involved with projects that enhance patient safety
- Interprofessional communication



Patient Safety

NCC MERP Index for Categorizing Medication Errors



Definitions

Harm

Impairment of the physical, emotional, or psychological function or structure of the body and/or pain resulting therefrom.

Monitoring

To observe or record relevant physiological or psychological signs.

Intervention

May include change in therapy or active medical/surgical treatment.

Intervention Necessary to Sustain Life

Includes cardiovascular and respiratory support (e.g., CPR, defibrillation, intubation, etc.)

Poll Question 3 (Use for Poll)

What can you take away from this presentation and bring back to your institution? What are other ways for healthcare professionals to be more "proactive" instead of "reactive" with handling medications?



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Thank You





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