Advocating for the Growth of Clinical Pharmacy

A presentation for HealthTrust Members

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Learning Objectives

- Recognize the benefit of tracking pharmacists' productivity
- Identify current measures around pharmacist productivity in a clinical setting
- Recall clinical pharmacist outcomes using published studies and recommend future guidance

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What is Clinical Pharmacy

" Clinical Pharmacy is a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention…Within the system of health care, clinical pharmacists are experts in the therapeutic use of medications. They routinely provide medication therapy evaluations and recommendations to patients and health care professionals"
– American College of Clinical Pharmacy (ACCP)

Source: ACCP. *Pharmacotherapy*. 28(6):816-817

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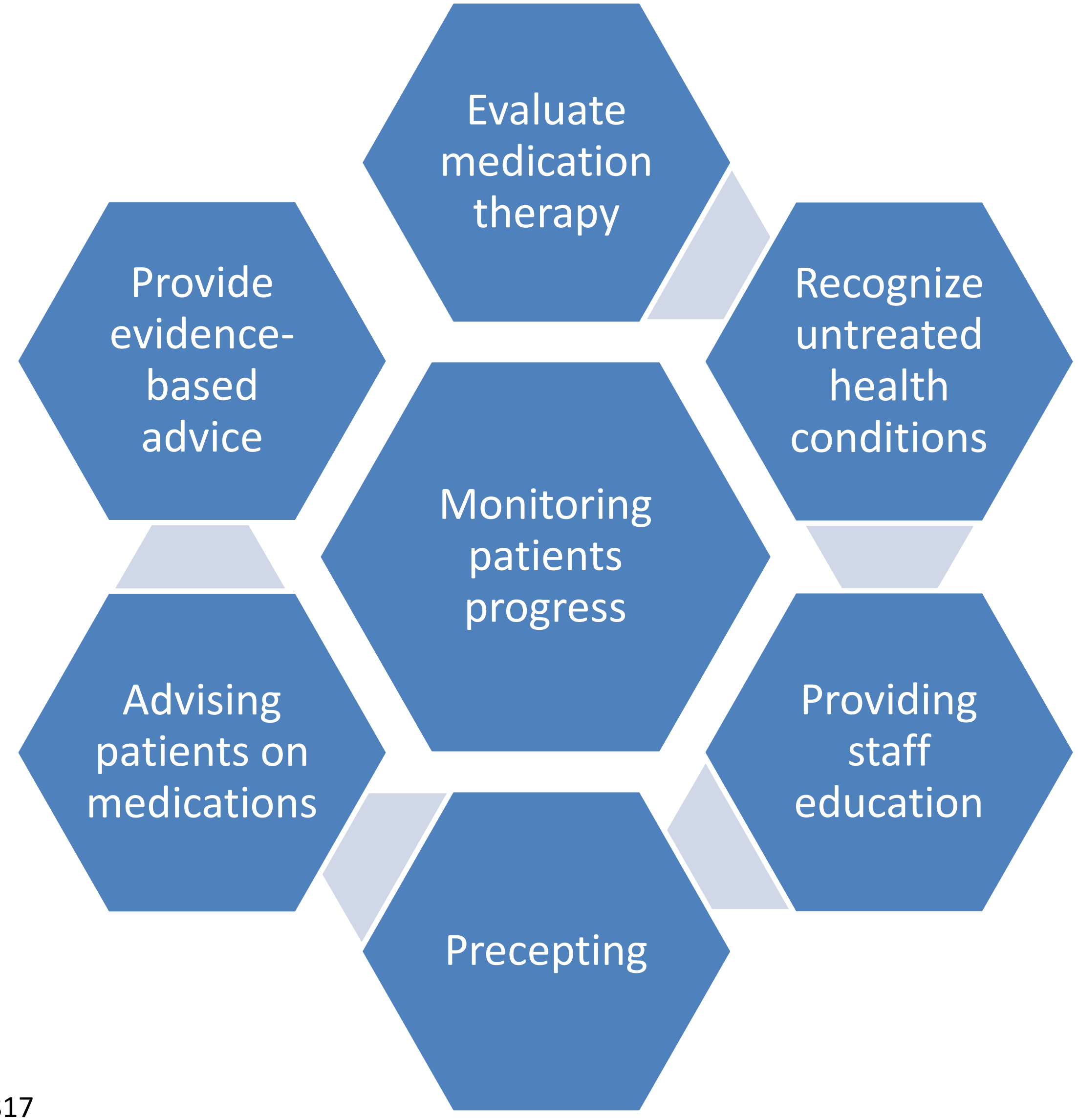
What are the day to day activities



Source: ACCP. *Pharmacotherapy*. 28(6):816-817

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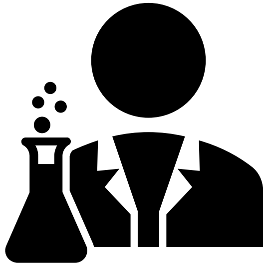
Introduction to Productivity

- Measures used by organizations to evaluate efficiency
- Throughout your workday, you produce a quantitative number of productivity units, which correlates to your general efficiency as an employee



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Introduction to Productivity

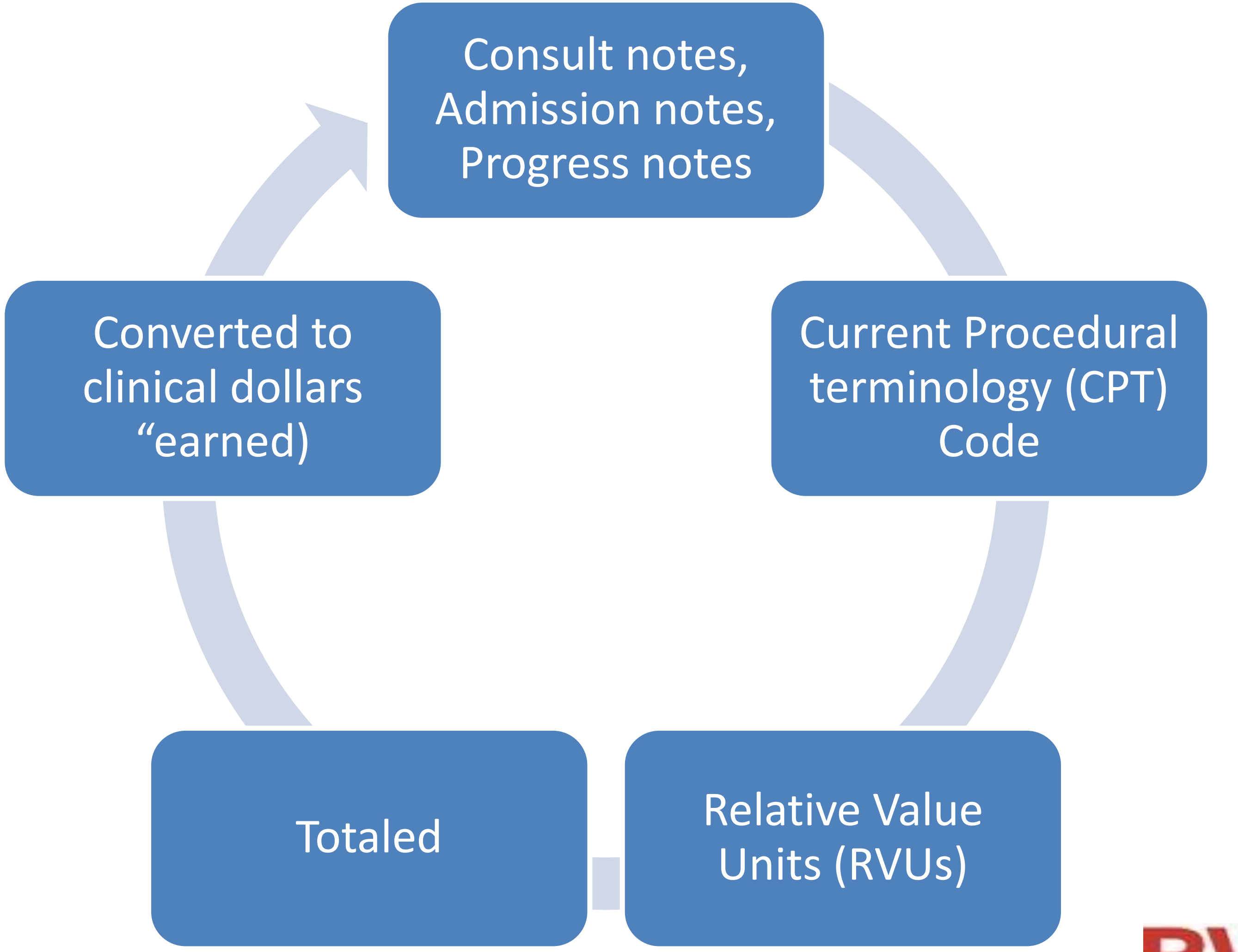
- Considered benchmarking, since goal is to seek out and implement the best practices at the best cost
- Basic idea to identify a point of comparison, against which everything else can be compared (ex. Each activity being relatable)

Purpose of Productivity Values

The purpose of the productivity value

- Understanding individual performance
- Assist in quantifying resources needed to complete a set of tasks
- Interpret the pharmacy department operational function, as a whole

Physician-Productivity Model



Source: Coleman M, et al. *Academic Medicine*. 78(7):682-689

Physician-Productivity Model

Table 1

Evaluation and Management Current Procedural Terminology (CPT) Codes and Relative Value Units (RVUs) Assigned to Pulmonary and Critical Care Progress Note Titles

Note Title	CPT Code	CPT Descriptor	RVU*
Pulmonary attending inpatient initial consult note	99253	Initial consult—low	1.82
Pulmonary attending inpatient consult follow-up note	99262	Follow-up inpatient consult—moderate	0.85
Pulmonary attending outpatient initial consult note	99243	New or established consult—low	1.72
Pulmonary attending outpatient consult follow-up note	99213	Established outpatient—low	0.67
Pulmonary attending telephone note	99372	Physician phone consultation—intermediate	0
Pulmonary/MICU attending admission note	99223	Initial care—high	2.99
Pulmonary/MICU attending progress note	99232	Subsequent care—moderate	1.06

*The RVU contains three components (physician work, practice expense, and malpractice). Only physician work is included here.

Source: Coleman M, et al. *Academic Medicine*. 78(7):682-689

Understanding Productivity

Partial factor productivity	Total factor productivity
Relates output to a single input	Relates an index of output to a composite index of all inputs

$$\text{Productivity} = \frac{\text{Work Output}}{\text{Labor Inputs}}$$

$$\text{Productivity Index} = \frac{\text{Present Productivity}}{\text{Base Period Productivity}}$$

Source: Vest T, et al. *AJHP*. 78(15):1402-1409

Productivity Model: Part 1

Purpose	• Intent to develop, validate, and implement an acute care clinical pharmacist productivity model
Methods	• Delphi methodology used to identify a comprehensive list of acute care pharmacist responsibilities in order of time intensity • Each responsibility assigned a weight and corresponding work output • Weighing assigned according to relative time intensity and complexity of each task

Source: Vest T, et al. *AJHP*. 78(15):1402-1409

Productivity Model: Part 1

Table 2. Top 20 Acute Care Clinical Pharmacist Responsibilities

Rank	Responsibility	Median Ranking[a]
1	Rounding (team rounds, transitions of care rounds, etc)	2
2	Profile review (prerounding, restarting home medications, hepatic dosing, renal dosing, medication therapy evaluation, etc)	2.5
3	Documentation (pharmacokinetics, notes, sign-out, consults, electronic health record messages, etc)	3.5
4	Order verification (entering orders, verifying orders, order clarification, medication substitutions, formulary interchanges, patient's own medication, etc)	4
4	Transitions of care (admission medication reconciliation, discharge medication reconciliation, education, counseling, transitions planning, etc)	4
6	Direct patient care precepting (reviewing patients, staffing experiences, etc)	6
7	Special population needs (medication assistance, prior authorization, chemotherapy, total parenteral nutrition, high-cost drug utilization, etc)	6.5
8	Calls (nursing and medical staff questions, changing products, troubleshooting, etc)	9.5
9	Non–direct patient care precepting (journal clubs, topic discussions, case presentations, in-services, didactic teaching, etc)	10
9	Staffing (cross-coverage, extra shifts or additional hours, weekend staffing, covering satellite pharmacy, on-call duty, etc)	10

Source: Vest T, et al. *AJHP*. 78(15):1402-1409

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Productivity Model: Part 1

11	Administrative activities (email, etc)	10.5
12	Meetings (staff meetings, department meetings, etc)	12
13	Committees and work groups (hospital-based, pharmacy and nonpharmacy, leading committees, etc)	12.5
13	Drug information (researching questions, drafting responses, reviewing policies and guidelines, etc)	12.5
15	Guidelines (drafting, updating, reviewing, maintaining, etc)	15
16	Critical response (code blue, rapid response, trauma, etc)	16.5
16	Mentoring (staff, residents, students, mentoring development, etc)	16.5
16	Research projects (precepting and mentoring, medication use evaluation, participation in research projects, developing posters/manuscripts, etc)	16.5
19	Education medical team (in-services, grand rounds, etc)	17.5
19	Resident training (orientation, staffing, etc)	17.5

[a]Based on median rank responses in terms of time intensity. Lower median value denotes higher rank and greater time intensity.

Source: Vest T, et al. *AJHP*. 78(15):1402-1409

Productivity Algorithm

Chris has been involved with transitions of care pharmacy duties and after rounds today, they completed 6 admission medications reconciliations, 4 discharge medication reconciliations, and counseled 2 patients on a new medication regimen. What is Chris' Daily Productivity?

Responsibility	Responsibility Weight	Measure	Measure Weight	Daily Transitions of Care Productivity
Transitions of Care	0.25	No. of admission medication reconciliations completed	0.15	Daily Transitions of Care Productivity = (0.25 * [((# of AMR)*0.15) + ((# of DMR*0.6) + ((# Counseled)*0.25)]]) / # of Pharmacists
		No. of discharge medication reconciliations completed	0.6	
		No. of patients counseled	0.25	
Productivity = (Rounding/Profile Review/Documentation Productivity + Order Verification Productivity + Transitions of Care Productivity) / No. of Pharmacists				
Productivity Index = Present Productivity / Base Period (Average) Productivity				
Base Period (Average) Productivity = Sum of Productivity / No. of Days				

Source: Vest T, et al. *AJHP*. 78(15):1402-1409

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(0.25 * [((# AMR)*0.15) + ((# of DMR*0.6) + ((# Counseled)*.25)]) / # of Pharmacists

(0.25 * [((6)*0.15) + ((4*0.6) + ((2)*.25)]) / # of Pharmacists

Source: Vest T, et al. *AJHP*. 78(15):1402-1409

Productivity Model: Part 2

Purpose	• Utilize the outputs from Part 1 to build and validate an acute care clinical pharmacist productivity model
Methods	• Work outputs from part 1 and relative weighting remained standard • The number of pharmacists verifying an inpatients medication order each day represented labor input • Productivity and productivity index values were calculated for each day from July 1, 2018, through June 30, 2019 • A multivariable linear regression was performed to determine the final work outputs for inclusion in the model.

Source: Simmons, Adrienne, et al. *AJHP*. 78(15):1410-1416

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Productivity Model: Part 2

Results

Work Output	*P* Value
Acute census	0.002
ED census	0.904
ICU census	0.070
Stepdown census	0.011
Newborn census	0.284
Observation census	0.747
Time-intensive medications	0.042
Admissions	0.013
New orders	0.000
Needs review orders	0.127
Edit orders	0.954
Discontinued orders	0.037
Orders entered by pharmacist	0.036
Orders discontinued by pharmacist	0.081
Admission medication reconciliation	0.000
Discharge medication reconciliation	0.013
Counseling	0.001

Source: Simmons, Adrienne, et al. *AJHP*. 78(15):1410-1416

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Productivity Model: Part 2

Results

Responsibility (Weight)	Work Output	Work Output	Weighting	Weight
Rounding/profile review and documentation (50%)	No. of patients based on level of care	**Work Output**	**Weighting**	25%
		ICU Census	40%	
		Step-down census	20%	
		Acute census	15%	
		ED census	20%	
		Observation census	2.5%	
		Newborn census	2.5%	
	No. of time-intensive medications			65%
	No. of new inpatient admissions			10%
Order verification (25%)	No. of orders verified	**Work Output**	**Weighting**	65%
		No. of new orders	70%	
		No. of transfer orders	10%	
		No. of edit orders	10%	
		No. of discontinued orders	10%	
	No. of RPh-initiated orders	**Work Output**	**Weighting**	35%
		No. of orders entered by RPh	75%	
		No. of orders discontinued by RPh	25%	
Transitions of care (25%)	No. of admission medication reconciliations completed			15%
	No. of discharge medication reconciliations completed			60%
	No. of patients counseled			25%

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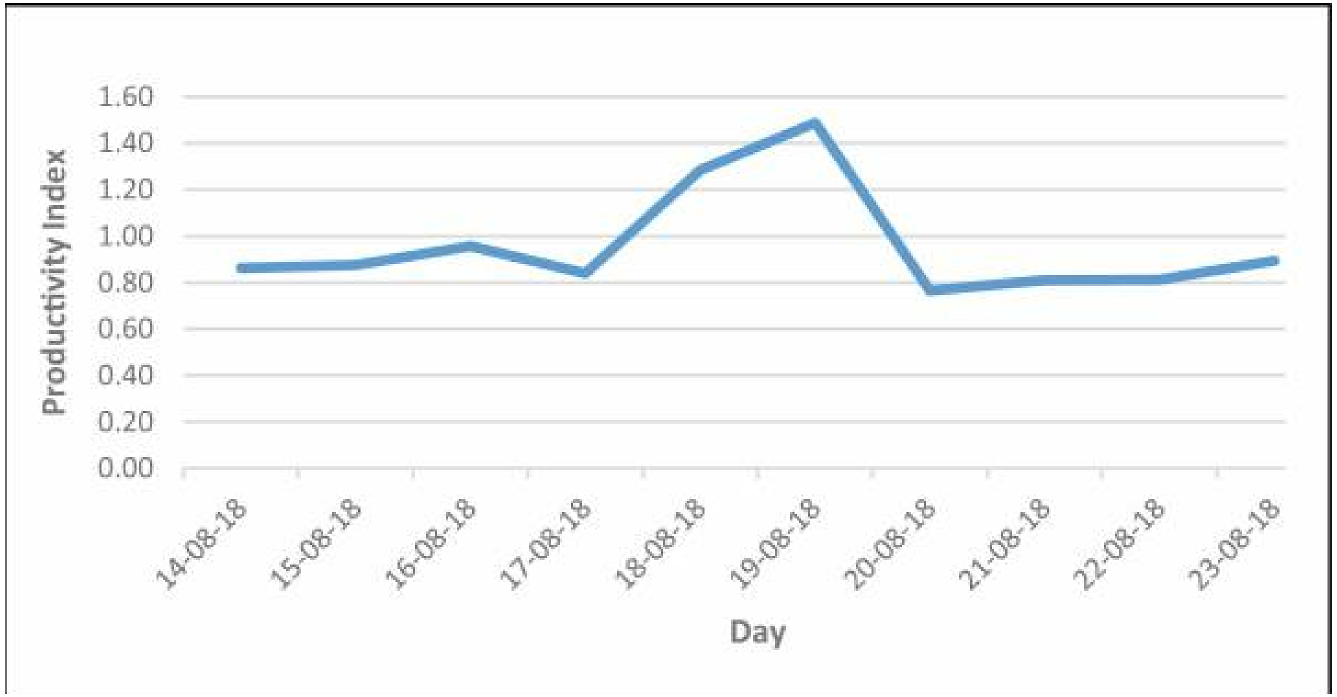
Source: Simmons, Adrienne, et al. *AJHP*. 78(15):1410-1416

Productivity Model: Part 2

Results



Source: Simmons, Adrienne, et al. *AJHP*. 78(15):1410-1416

Productivity Model: Part 2

Conclusion	• Development of an acute care clinical pharmacist productivity model is achievable using validated consensus methodologies and data analytics • This model, coupled with clinical outcomes, helps articulate the value that pharmacists bring to the healthcare team.

Source: Simmons, Adrienne, et al. *AJHP*. 78(15):1410-1416

What is the Benefit of Tracking Productivity?

Promote additional Full-time Equivalents

Demonstrate increased patient care

Productivity Metrics

Observe patient satisfaction

Identify employee strengths and areas of improvement

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Negativity on Clinical Staff

- Impact Moral
- Focus on quantifiable tasks
- Sense of micromanaging

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Assessment Question #1

Which of the following is a benefit to tracking pharmacist productivity, for both the employer and the employee?

1. Compare the output of a pharmacist to other healthcare professional (physicians, nursing, etc.)
2. Help obtain more full-time equivalents and the hiring of new employees
3. Discuss with the employee that they are below average in completing tasks
4. Act in a way to promote micromanaging of a team

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Assessment Question #1: Correct Response

Which of the following is a benefit to tracking pharmacist productivity, for both the employer and the employee?

1. Compare the output of a pharmacist to other healthcare professional (physicians, nursing, etc.)
2. **Help obtain more full-time equivalents and the hiring of new employees**
3. Discuss with the employee that they are below average in completing tasks
4. Act in a way to promote micromanaging of a team

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History of Clinical Pharmacy

1990’s

Drive around financial changes

2006

FTE’s per dose billed

2020-2021

Standardizing tasks and finding impact

Source: Gupta SR, et al. *Am J Health Syst Pharm*. 63(18):1728-1734

Intervention Tool

- Tracks interventions, errors, and key financial data
  - Pharmacist manually inputs the:
    - Activity performed
    - Time spent
    - Number of occurrences

Documentation Categories	
Intervention Quick	Medication Incidents
Adverse Drug Reaction	Intervention

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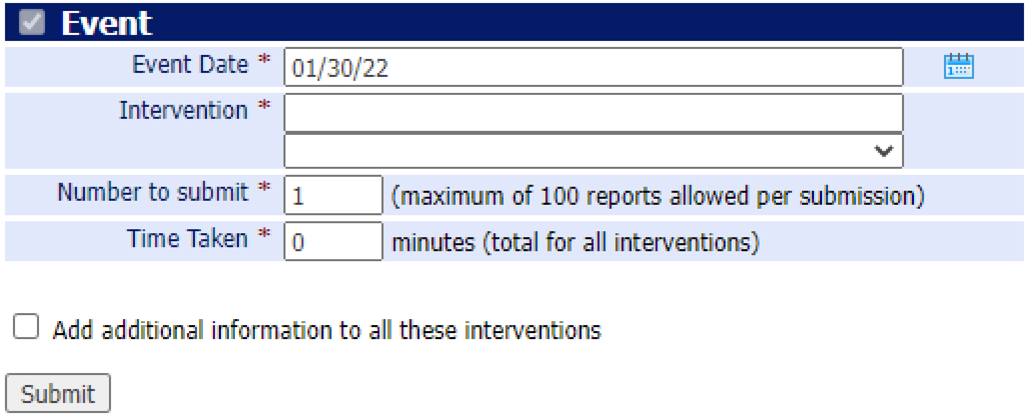
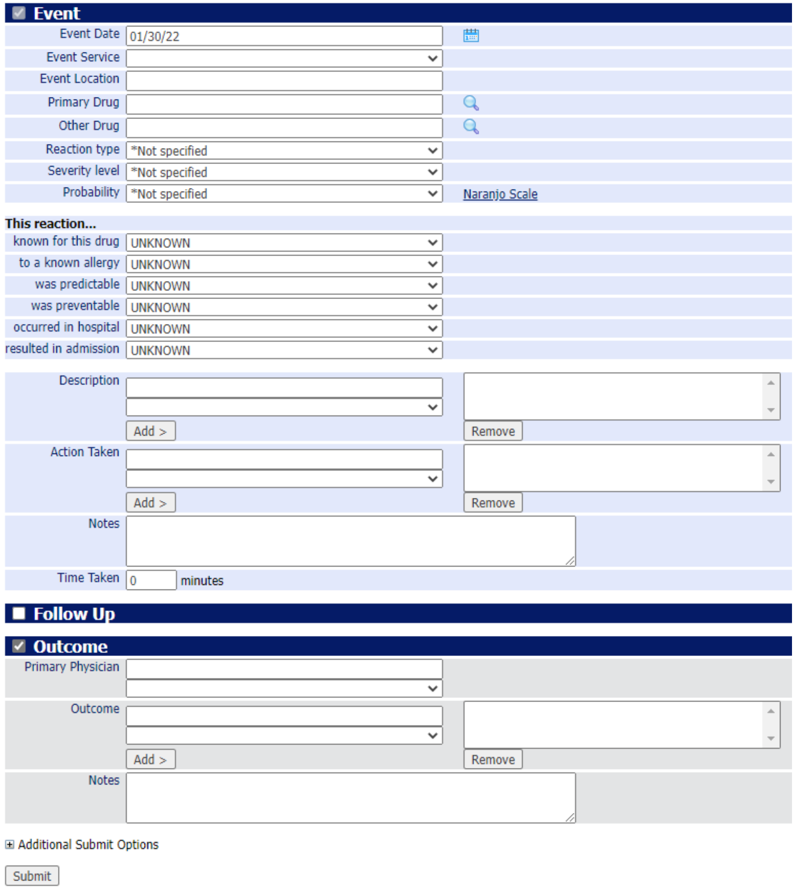
Intervention Tool

Intervention Quick



Intervention



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Intervention Tool

- Types of reports that can be generated:
  - Adverse Drug Reactions Prevented and adjusted per 10,000 doses dispensed, retrieved from ADR / ME Report
  - Monthly Medication Errors documented and adjusted per 10,000 doses dispensed, retrieved from ADR / MR Report
  - Biosimilars savings year to date
  - % of Transitions of Care consults opportunities in MTPL (LACE > 11) completed
  - Number of Admission Medication Histories completed

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EHR System

- Medication reconciliations pended
- Education provided to patient (note placed with medication to bedside)
- Naloxone orders with active opioids
- Formulary compliance – pre/post pharmacy intervention
- Interventions edited

Assessment Question #2

The interdisciplinary team just completed morning rounds. During the patient rounding you recommended initiating famotidine 20mg daily as stress ulcer prophylaxis. How would you ensure that your recommendation was accounted for in your pharmacist output?

1. Excitingly notify your manager and they will remember it
2. Input the recommendation into your institution's collection software
3. Disregard any input

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Assessment Question #2: Correct Response

The interdisciplinary team just completed morning rounds. During the patient rounding you recommended initiating famotidine 20mg daily as stress ulcer prophylaxis. How would you ensure that your recommendation was accounted for in your pharmacist output?

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Mechanisms to Advocate for Growth

- Pharmacy administration often asked to justify clinical pharmacy services

Generalizing evidence or Local Evaluations

Clinical

Humanistic

Economic

Regulatory

Clinical Outcomes

Purpose	• Assess the effects of a pharmacist on multidisciplinary ICU teams on mortality, ICU length of stay, and adverse drug events
Methods	• 14 Systematic reviews and meta-analysis from 1999-2017 • Targeted published articles with pharmacist participation in ICU teams • All randomized controlled trials and observational studies were selected and studies with no comparison group were eliminated • ICU length of stay and adverse drug events performed with subgroup analysis

Source: Lee H, et al. *Crit Care Med*. 47(9):1243-1250

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Clinical Outcomes

Results

Outcomes	Study Design: No. of Participants (Studies)	Findings (95% CI)	Quality of Evidence[a]
Primary outcome			
Mortality	Randomized controlled trial: 135 (1); observational: 26,717 (9)	Odds ratio: 0.78 (0.73–0.83)	⊕⊕ Low[b,d]
Secondary outcomes			
ICU length of stay			
All types of ICU	Observational: 26,050 (8)	Mean difference: [g]–1.06 (–1.45 to –0.66)	⊕⊕⊕ Moderate[b]
Mixed ICU	Observational: 25,626 (5)	Mean difference: [g]–1.33 (–1.75 to –0.90)	⊕⊕⊕ Moderate[b]
Medical ICU	Observational: 284 (2)	Mean difference: 0.46 (–0.70 to 1.62)	⊕⊕ Low[b,e,f]
Adverse drug events			
Preventable	Observational: 683 (4)	Odds ratio: [g]0.26 (0.15–0.44)	⊕⊕⊕ Moderate[b]
Nonpreventable	Observational: 683 (4)	Odds ratio: 0.47 (0.28–0.77)	⊕⊕⊕ Moderate[b]

⊕ = attainment of Grading of Recommendations, Assessment, Development, and Evaluation criteria.

[a]Grading of Recommendations, Assessment, Development, and Evaluation rates the quality of evidence based on five domains ([b]study limitations, [c]inconsistency, [d]indirectness, [e]imprecision, and [f]publication bias).

[g]$p < 0.05$.

Source: Lee H, et al. *Crit Care Med*. 47(9):1243-1250

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Clinical Outcomes

Discussion	• Improved ICU care was associated with the addition of a pharmacist • Pharmacists in the multidisciplinary team can reduce adverse drug events
Conclusion	• Addition of a critical care pharmacist in an intensive care setting has benefit on mortality and adverse drug events

Source: Lee H, et al. *Crit Care Med*. 47(9):1243-1250

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Humanistic

- Supportive evidence around
  - Improved functioning
  - Increased independence
  - Fewer adverse health effects
  - More energy, peace of mind, and exercise tolerance

- Conflicting evidence around
  - Health-related quality of life

Source: Chumney EC et al. *Pharm Pract (Granada)*. 4(3):103-109
Source: Krska J et al. *Age Ageing*. 30(3):205-211
Source: Hanlon JT et al. *Am J Med*. 100(4):428-437

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Economic Benefit

Purpose	• Association between pharmacist-managed antimicrobial prophylaxis on Medicare charges, drug charges, and laboratory charges
Methods	• Pharmacist management of antimicrobial prophylaxis was evaluated in 242,704 Medicare patients from 806 hospitals

Source: Bond CA, et al. *AJHP*. 64(18):1935-1942

Economic Benefit

Results	Without a pharmacist: • Total Medicare charges were 3.10% higher ($980 ± $1,109 more per patient) ($182,113,400 excess total Medicare charges, $p < 0.0001$) • Drug charges were 7.24% higher ($292 ± $492 more per patient) ($54,262,360 excess drug charges, $p = 0.005$) • Laboratory charges were 2.72% higher ($74 ± $151 more per patient) ($13,751,420 excess laboratory charges, $p = 0.0056$)
Conclusion	• Pharmacist-managed antimicrobial prophylaxis was associated with significant improvement in economic outcomes for Medicare patients with a surgical code indicative of the need for antimicrobial prophylaxis.

Source: Bond CA, et al. *AJHP*. 64(18):1935-1942

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Regulatory

Purpose	• To identify characteristics of transplant-related pharmacy services at comprehensive transplant centers.
Methods	• Survey regarding number of full-time equivalent (FTE) transplant pharmacists relative to number of annual transplants, transplant pharmacy model, roles in inpatient and clinic environments, training and specialization, funding sources, and expansion plans

Source: Staino C et al. *Prog Transplant*. 23(1):23-27

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Regulatory

Results	• Mean 325 transplants were performed • Mean number of pharmacist FTEs was 4.25 • Yielded a transplant-to-pharmacist ratio of 76.5
Conclusion	• Large comprehensive transplant centers use multiple transplant pharmacists to perform patient care in the inpatient and outpatient environments, with most centers planning to expand FTEs.

Source: Staino C et al. *Prog Transplant*. 23(1):23-27

Assessment Question #3

Clinical pharmacy services have shown benefit in the which area based on published studies? (Choose from all of the above)

1. Clinical
2. Humanistic
3. Economic
4. Regulatory

Assessment Question #3: Correct Response

Which of the following categories used to help demonstrate the utility of a clinical pharmacist is involved with using data collected and analyzed based on patient recommendations made during care rounds? (Choose from all of the above)

1. **Clinical**
2. **Humanistic**
3. **Economic**
4. Regulatory

Conclusion

- Productivity measures
  - Aim to understand an employees output
  - Interpreted in pharmacy and other healthcare fields
  - Used to help promote additional staff and discuss performance
- Clinical pharmacy
  - Began with financial incentives
  - Transitioned to output based on standardized productivity metrics
  - Goal: connect output to outcomes for best patient care and clinical pharmacy expansion

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Thank you!

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