



Benchmarking and Productivity: Leveraging Data to Drive Results

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Disclosures

- ❖ Neither Steve Rough nor Philip Brummond have relevant financial relationships to disclose nor any actual or potential conflicts of interest in relation to this presentation



Learning Objectives

- ❖ Discuss industry benchmarking standards and how pharmacy leaders must understand the development of these reports
- ❖ Explain steps for developing an action plan that supports practice advancement, departmental growth, and effectiveness
- ❖ Develop strategies for responding to variances to industry benchmarks



Schedule

- ❖ 70 minutes didactic session and listserv survey result review
- ❖ 20 minutes open Q&A
- ❖ 90 minute lunch break
- ❖ 50 minutes case overview and small group activity
- ❖ 30 minutes case report out and group discussion
- ❖ 10 minutes final summary and Q&A



Getting to Know the Audience

How many use external benchmarking?



Getting to Know the Audience

How many perform internal benchmarking?



Getting to Know the Audience

How many are held accountable to benchmarking metrics in the budget process?



Getting to Know the Audience

How many completed our survey?



Getting to Know the Audience

Who has more questions than answers
related to benchmarking?



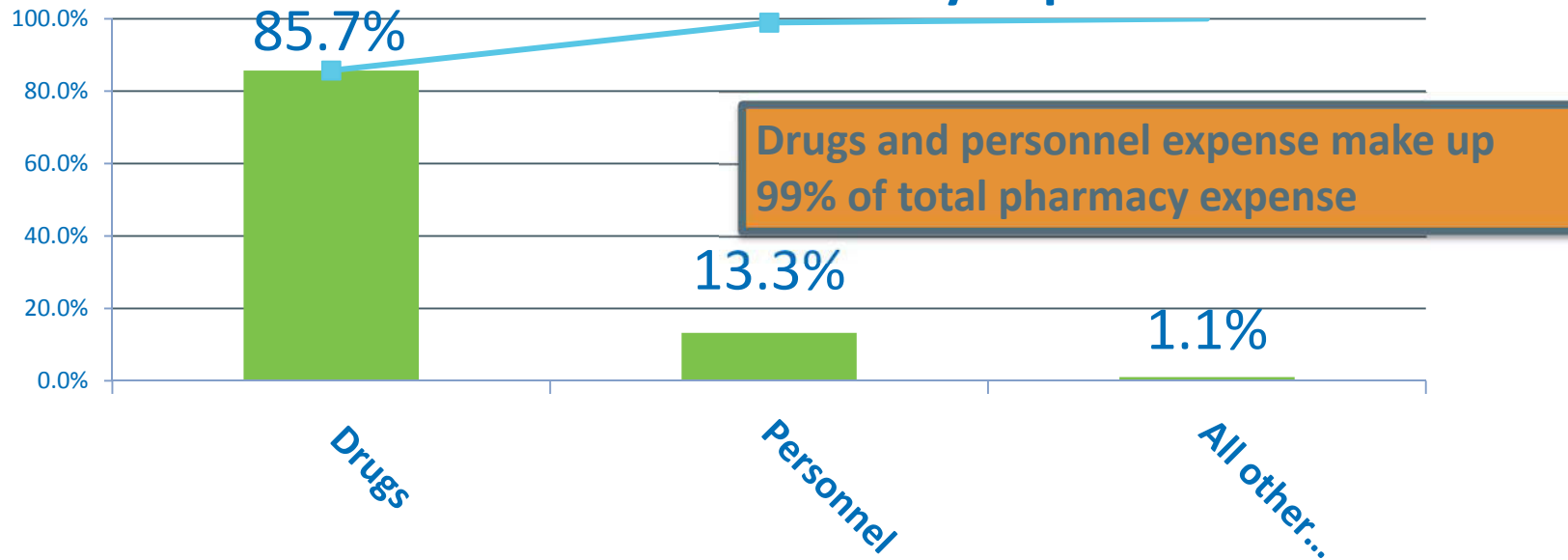
What does Pharmacy look like to Senior Leadership?

- ❖ A high cost department that I don't understand
 - Expensive drugs and employees
- ❖ Budget is a black hole
- ❖ An expense to be managed rather than an investment to be optimized
- ❖ When they talk quality it's often not well understood
- ❖ Lot of questions:
 - A vital clinical resource?
 - Critical for quality and safety?
 - Key to organization's success?
 - A department very different from most others?

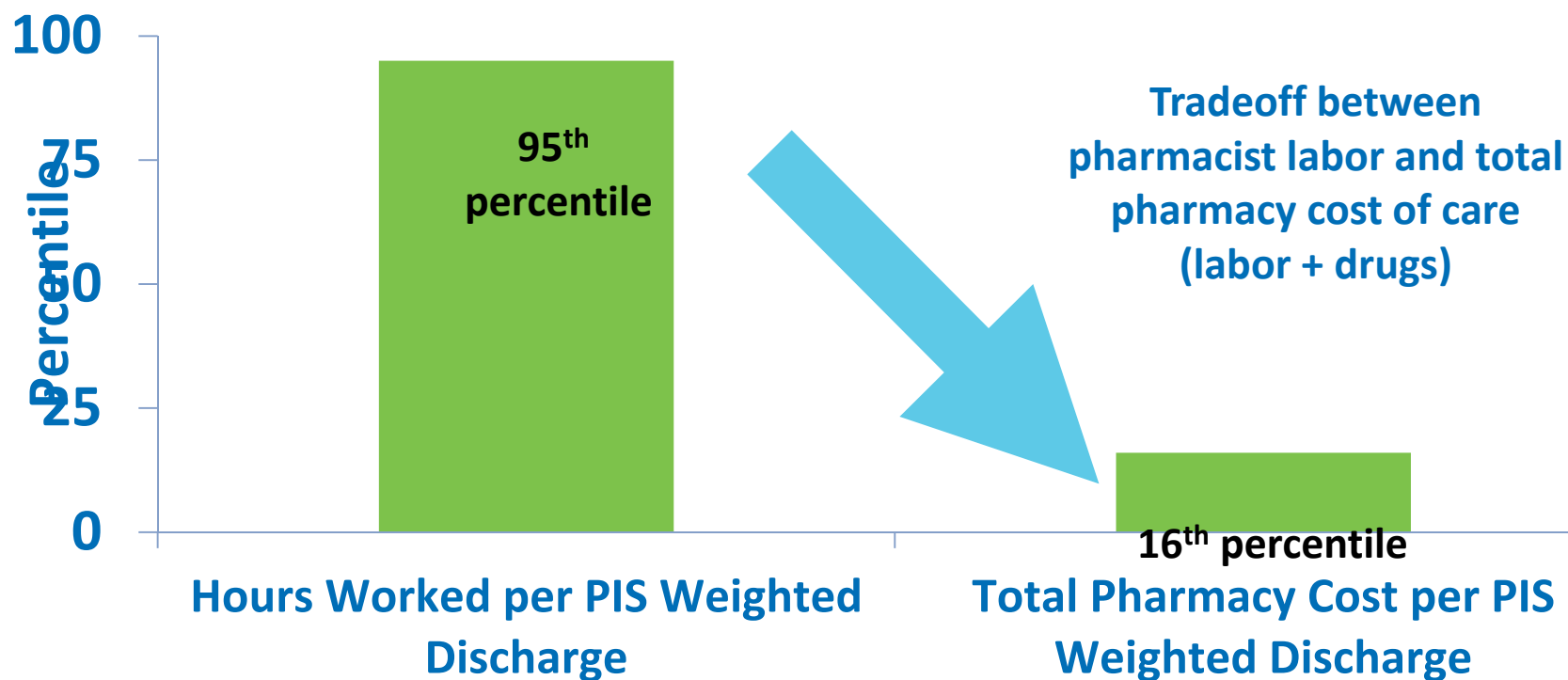


UW Health Pharmacy Department *Review of Expenses*

Pareto Chart of Pharmacy Expense



UW Health Pharmacy Performance vs. AMC Peers (Action-OI Data)



Benchmarking



Which company is credited with establishing benchmarking?

A. Toyota



B. Xerox



C. Apple



D. GE



Xerox Corporation, 1970s

Measured themselves against industry leaders

Products, services, practices

Systematic identification and implementation of best practices

[Am J Health Syst Pharm.](#) 2010 Feb 15;67(4):300-11.



Internal vs. External

Internal Benchmarking

Comparing to oneself
over time

External benchmarking

Comparing your
institution to other
institutions of similar
size, pharmacy services
offered, etc.



Background: Benchmarking

- ❖ Benchmarking is increasingly applied within health systems as a tool for continuously evaluating department success
- ❖ Pharmacy departments are often expected to incorporate benchmarking data into their annual budgeting process
- ❖ Productivity monitoring systems are gaining prevalence among hospital administrators
 - Expectation is to drive out waste and lower cost
 - Pharmacy managers required to explain metrics related to performance and constructively identify their shortcomings and pitfalls



Background: Benchmarking

- ❖ Benchmarking software available through a limited number of commercial vendors
 - Systems unable to effectively measure department operational and overall performance
- ❖ Through effective benchmarking, pharmacy departments should be able to identify opportunities for improving the department's overall value
 - Workflow efficiency, financial performance and patient care services
- ❖ If applied ineffectively, benchmarking systems can lead to staffing changes that negatively impact the safety and quality of patient care



Is benchmarking all theoretical?



Am J Health Syst Pharm. 2010 Feb 15;67(4):300-11. | Manag Healthc Exec. 2003; 13(9):36-8. | Jt Comm J Qual Improv. 1994; 20:229-38. | Healthc Finanac Manage. 2001; 55:67-70.

The Ultimate Value?

- ❖ Develop a pharmacy workload monitoring system that analyzes the impact of pharmacy services on patient outcomes and quality
- ❖ Measure overall effectiveness and value of pharmacists patient care services
- ❖ Define pharmacy workload as all activities related to providing pharmacist patient care services (eliminate widgets)

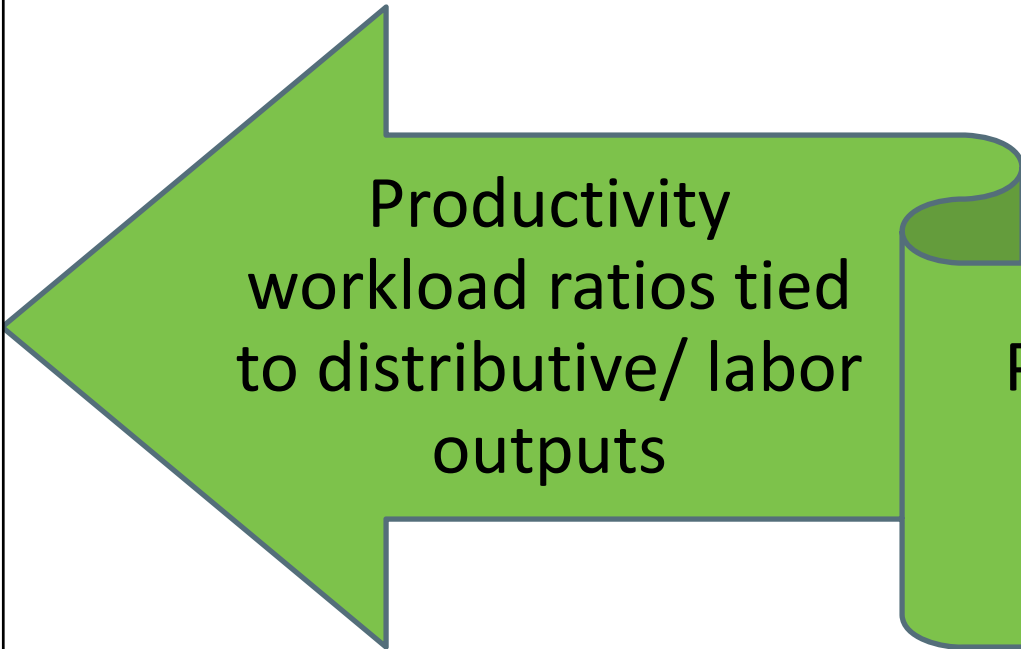


The Ultimate Value?

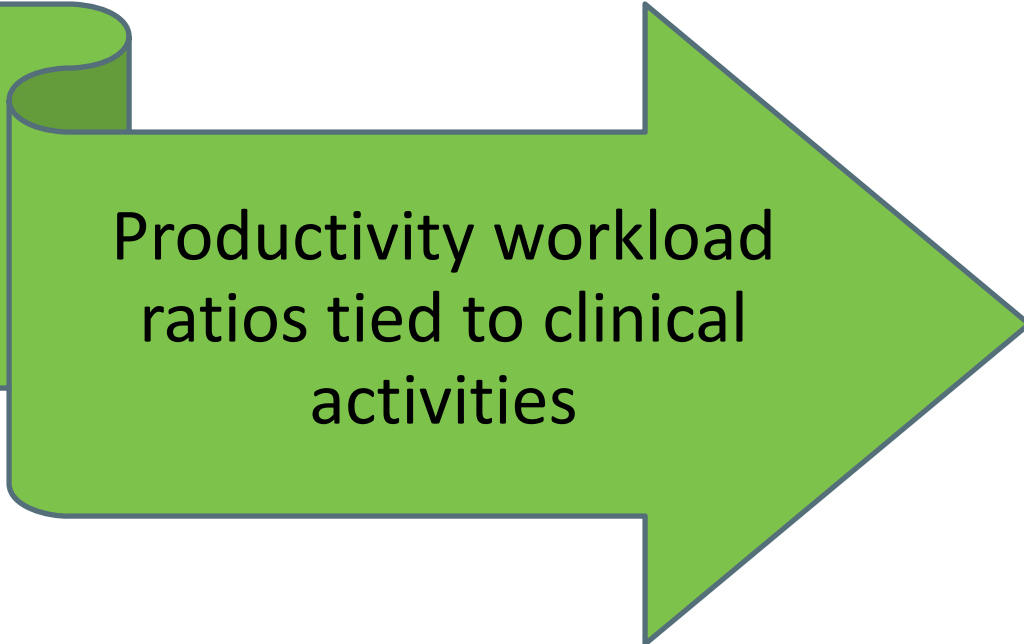
- ❖ Need valid and more reliable methods and metrics to assess pharmacy workload and staffing effectiveness
 - linkages between pharmacy investment in best practice and overall hospital performance
 - Total cost of care
 - Avoided costly adverse drug events
 - Regulatory compliance
 - External quality scores
 - Nursing and physician satisfaction
 - Population health



How should we assess pharmacy services?



Productivity
workload ratios tied
to distributive/ labor
outputs



Productivity workload
ratios tied to clinical
activities

[Am J Health Syst Pharm. 2010 Feb 15;67\(4\):300-11.](#) | [Am J Health-Syst Pharm. 1999; 56:1102-7.](#) | [Am J Health-Syst Pharm. 2000; 57\(suppl 2\):S28-31.](#) | [Am J Health-Syst Pharm. 1995; 52:2676-80.](#) | [Am J Hosp Pharm. 1978; 35:1487-95](#) | [Am J Health-Syst Pharm. 1999; 56:516-8.](#) | [Pharm Pract Manag Q. 2000; 19\(4\):1-6.](#)

Practical metrics

- Workload metrics
 - Labor metrics
 - Cost metrics
 - Outcome metrics
-
- There is no single perfect metric – will need a combination...

Polling Question



Pharmacy benchmarking systems should measure the impact of pharmacy services on patient outcomes and total cost of care?

- A. True
- B. False



Polling Question



Pharmacy benchmarking systems should measure the impact of pharmacy services on patient outcomes and total cost of care?

A. True

B. False



External Benchmarking



External Benchmarking: Definition

- ❖ System whereby hospitals submit department level data into a vendor-managed financial and operational comparative database, to enable comparison of department operational and financial performance versus similar (peer) organizations
- ❖ Provides a process for measuring costs, services and practices against “best in class” organizations
- ❖ Target key areas for cost control





Common External Benchmarking Metrics

❖ Cost-based ratios

- Total pharmacy cost per intensity weighted (adjusted) discharge
- Drug cost per intensity weighted (adjusted) discharge
- Labor cost per intensity weighted (adjusted) discharge

❖ Labor productivity ratios

- Hours worked per intensity weighted (adjusted) discharge or patient day
- Hours worked per CMI weighted (adjusted) discharge or patient day
- FTEs per order processed (or doses billed, or occupied bed)
- Pharmacists per 100 beds



External Benchmarking “Gotchas”

- ❖ Department definitions and revenue adjustments
- ❖ Inability to identify peer group characteristics and extent of best practice implementation
- ❖ Drug expense classes not reported
- ❖ Case mix index (CMI) to approximate patient acuity
- ❖ Clinical activity (workload performance) measures are ambiguous, unclear and lack meaning
- ❖ Normalizations not applied consistently for high cost drugs
- ❖ Rebates, credits, disproportionate share



External Benchmarking “Gotchas”

- ❖ Reporting instructions are vague
- ❖ Labor and cost ratios, and key performance indicators, are flawed
- ❖ Worked hours may not factor in “skill mix” nor “labor cost”
- ❖ No evaluation of quality or safety
 - No measure of overall value derived from pharmacy
- ❖ Orders have little to do with pharmacist clinical work
 - Different computer systems will counts “orders” differently



Revenue Adjustments

❖ EXP/100 INT ADJ DPT ADJ PT DY: Drug

- “Inpatient Drug expense per 100 intensity adjusted department adjusted pt days”
- $\text{Inpatient Drug Expense} / ((\text{PIS} * 100) * (\text{Dept Gross Rev} / \text{Dept IP Rev}) * \text{Patient Days})$
- “Gross Revenue” should include inpatient and clinic/ambulatory revenue
- Inpatient is very misleading, because it really includes “clinic administered drugs”

❖ NOTE:

- Total Dept Gross Revenues/Inpatient Revenue in ratio denominator
- Designed to “adjust” for clinic drugs to back into accurate “inpatient costs”
- Higher Outpatient markup will make you a star performer
- Reporting retail or clinic revenues but not associated drug cost will make you a star performer
- High cost ambulatory clinic drugs = disproportionate share of revenues
- 2005 survey - 50% of hospitals don’t report drug costs properly!



Flaws with Combining Inpatient and Ambulatory

- ❖ Inconsistency in where (and if) clinic administered, procedure area and oncology medications are reported
- ❖ Some top performers do not report clinic drug expense according to the reporting instructions (gaming?)
- ❖ Some-physician owned practices have the cost for clinic drugs
- ❖ Vendor instructions flip-flop and data coordinators don't keep up
- ❖ Single patient infusion can exceed \$200,000 per year (huge cost/ dose)
- ❖ No clinic CMI or Pharmacy Intensity Score – how do you account for large infusion centers, transplant clinic, etc?



Example (Double Jeopardy!)

Hospital A

- ❖ \$500k clinic drug cost (outsourced to MDs)
- ❖ 80 clinics with 10 FTE RPh

Low drug cost, \$1.3million pharmacy labor costs

Hospital B

- ❖ \$15 million clinic drug cost (infusion, onc)
- ❖ 80 clinics, 0 RPh, 1 FTE pharmacy technician

High drug cost, \$40k pharmacy labor costs

If you don't report clinics expense separately from inpatient:

- Hospital B's Administration says "Why aren't our pharmacists doing as good of a job at controlling drug expense as Hospital A? We want you to cut your IP drug costs by \$15 million next year."
- Hospital A's Administration says "We want you to be more labor efficient, find a way to cut 10 FTEs of inpatient pharmacist expense so we can manage our labor costs as well as hospital B."



Acuity Adjustment

- ❖ Acuity adjustment is ideal
- ❖ Enables direct comparison among institutions, regardless of patient mix
- ❖ Current adjuster (CMI) is from CMS (total resource use), plus regional wage index adjustment
- ❖ CMI based on “overall” resource consumption
- ❖ Inadequate for medication expense (BMT vs hip replacement example)
- ❖ Pharmacy Example: CMI assigns similar acuity ratings to patients who require vastly different levels of medication resources to achieve a positive outcome
- ❖ Thus, using CMI to adjust for hospital acuity can identify poor performers as benchmarks and good performers as deficient!



Beware of CMI Groupings

- ❖ In the absence of adequate acuity adjustment, meaningful peer grouping is necessary
- ❖ Goal is to identify the right peers
- ❖ Pharmacy Intensity Score developed by UW Health Pharmacy Department and adopted by Solucient in early 2000's



What is Pharmacy Intensity Score?

- ❖ Pharmacy Intensity Score = resource-based relative value intensity (R-BRVI) grouping system that utilizes pharmaceutical resource consumption data to produce DRG-specific drug use requirements (weights)
- ❖ Data collected via Clinical Data Base to assign a weight to every DRG (0.1 to 100; DRG with highest median drug cost per admission assigned value of 100)
- ❖ $\sum(\text{DRG intensity weights} \times \text{DRG volumes}) / \text{Total Admissions} = \text{Pharmacy Intensity Score}$
- ❖ Can now adjust ratios for pharmacy intensity rather than CMI intensity with some vendors
- ❖ Caution: pharmacy intensity score adjusted annually, need to watch closely



How do CMI and Pharmacy Intensity Score Match-up?

DRG	CMI Weight (Range: 0.1-18.7)	P.I.S. (Range: 0.1-100)
BMT	6.1 (32.6%)	100
Kidney Tx	3.2 (17.1%)	27.5
Hip Replacement	3.2 (17.1%)	7.8
CABG	7.3 (39%)	19.5
Acute Leukemia	3.5 (19%)	14.5
Cardiac Valve	5.7 (31%)	17.8

Treated as same "acuity" in CMI-based system
despite 3-fold difference in PIS system



More Gotchas

Productivity measured by doses charged or dispensed

- Does not capture clinical interventions and outcomes
- Internally prepared medications vs. manufacturer-packaged doses
- Technology counting 10 units of insulin as “10 doses” vs. “1 dose”
- Cheap, time-intensive medications

Patient days

- Bulk of pharmacist intervention/medication cost is within the first half of hospitalization
- Impacted by hospital system management of patient discharges
- Increased hospital efficiency → improved patient outcomes, decreased patient length of stay, but same cost of medications
- As hospital reduces LOS versus peers, pharmacy looks worse!



[Am J Health Syst Pharm. 2010 Feb 15;67\(4\):300-11.](#)

Patient Days versus Admissions

- ❖ Can result in substantial declines or improvements in performance depending on how well your discharge process is managed
- ❖ If hospital doesn't manage discharge process well, department will look better if they choose "patient days" as their indicator of performance because most pharmacy drug expense is on the front end of admission
- ❖ Changes in organizational assignment of "temporary" or "observation" status for inpatients patients can increase or decrease one's reported patient days, resulting in immediate better or worse performance versus peers if "patient days" is used in the denominator



Metric Suggestions

- ❖ Drug cost / admission
- ❖ Total pharmacy cost / discharge
- ❖ RPh worked hours / order (or 100 orders, or discharge)
- ❖ Tech worked hours / dose dispensed
- ❖ Evaluate all metrics based on pharmacy intensity score and CMI weightings
- ❖ Use quality outcomes measures whenever possible
- ❖ Never evaluate a labor metric without a corresponding cost metric!



Metrics to Avoid

- ❖ Patient days in denominator
- ❖ Revenue adjusted (adj)
- ❖ Hours worked
- ❖ Hours paid
- ❖ Orders processed
- ❖ Number of clinical interventions



Necessary Improvements in Commercial Systems

- ❖ Meaningful department breakouts
 - Inpatient = true inpatient
 - Outpatient = clinics, infusion centers (onc and non-onc), procedure areas, dialysis, amb surg, cath lab, ED, etc
 - Retail
 - Other (informatics, administration, drug policy, research, consulting, etc)
- ❖ Modernized characteristic surveys reflective of extent of best practice implementation for safety (model example included in white paper)
- ❖ Improved drug expense breakout reporting (model example included in white paper)
- ❖ Shift from CMI to PIS for all cost and labor metrics
- ❖ Eliminate clinical activity measures (or make optional)

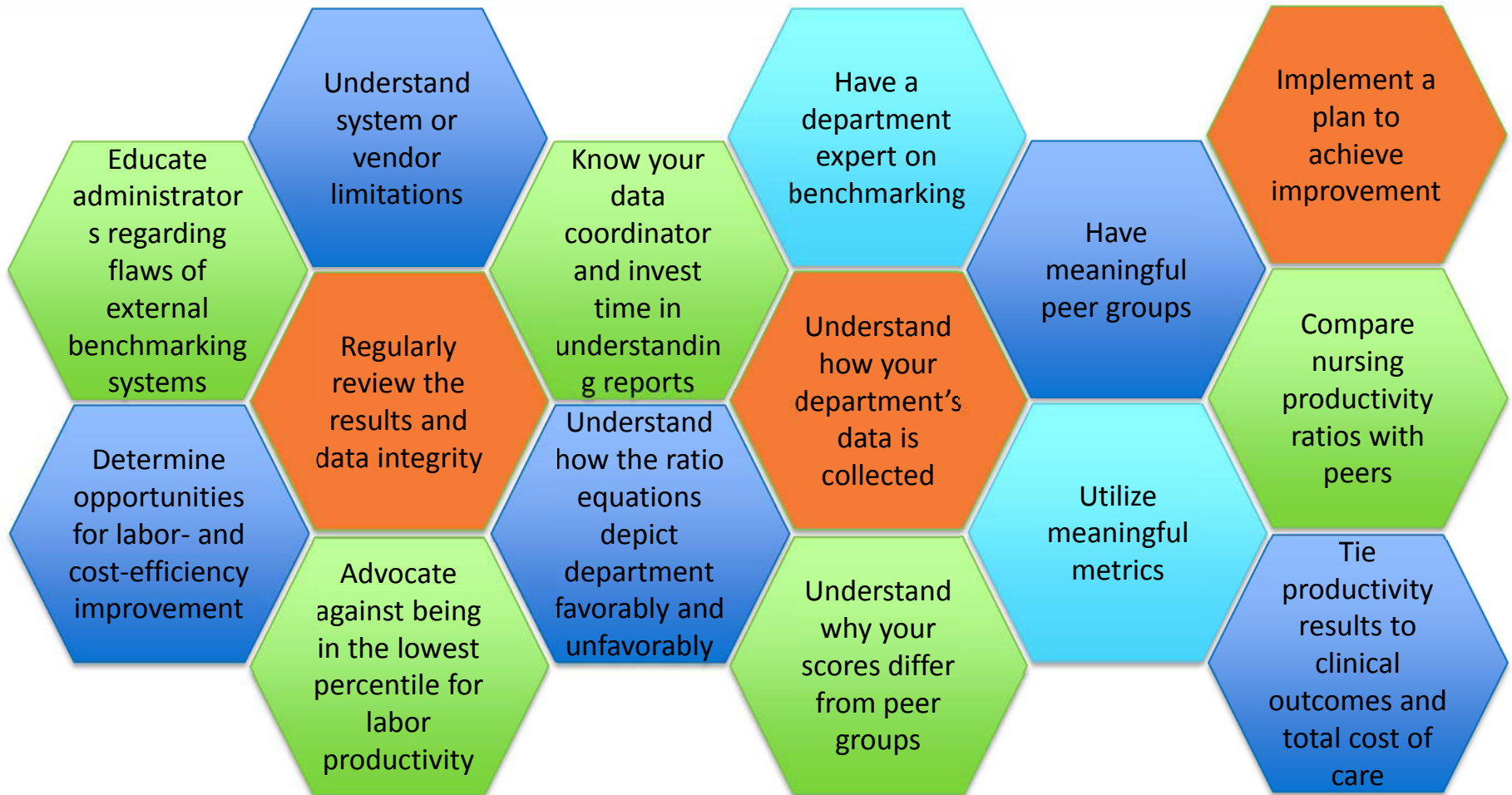


Necessary Improvements in Commercial Systems

- ❖ Consistently applied normalizations for high cost drugs
- ❖ Consistency in handling rebates and expired drug credits back to pharmacy
- ❖ Clear flagging of 340b sites
- ❖ Clear reporting instructions and clear metric definitions
- ❖ Improved quality assurance review of data (rules to test for data integrity and reliability)
- ❖ Meaningful key indicator (labor AND cost ratio) metrics



Tips for Success: External Benchmarking



Polling Question



Which of the following can be measured with commercially available benchmarking and productivity monitoring software?

- A. Patient outcomes
- B. Pharmacists impact on total cost of care
- C. Predefined pharmacists staffing efficiency metrics
- D. Extent to which pharmacy clinical services are implemented



Polling Question



Which of the following can be measured with commercially available benchmarking and productivity monitoring software?

- A. Patient outcomes
- B. Pharmacists impact on total cost of care
- C. Predefined pharmacists staffing efficiency metrics
- D. Extent to which pharmacy clinical services are implemented



Working with Commercial Vendors and Consultants

Often downplay pharmacy departments services

Available systems do NOT:

Pharmacy managers need to explain metrics and identify shortcomings

Pharmacy is unique: largest cost is not personnel

- Lack expertise in defining and measuring pharmacy practice
- Cost-minimization goals often conflict with pharmacy department's goal of expanding clinical services and implementing best practices
- Typically assess ratio of staffing to widgets produced
- Measure total cost of care as related to individual department costs/services
- Measure patient outcomes
- Must defend against claims of consulting benchmarking organizations
- Many do not have objective data to support services
- Spend more time justifying why monitoring system is flawed than using it
- Inverse relationship → decrease in pharmacist staffing often leads to higher overall hospital costs (e.g., medication errors, adverse drug events)

2010 Feb 15;67(4):300-11.

Advice when working with benchmarking consultants

- ❖ Ask consultants to share their details
 - Peer group
 - Characteristic survey data
 - Year data was submitted
 - Cost and labor metrics (the right ones)
 - Insist on comparing based on contemporary metrics and quality standards

- ❖ Strive to achieve savings targets through drug cost savings



Caution...

- ❖ “If all you have is a hammer, everything is a nail”
 - Today’s systems do not evaluate the impact of pharmacy services on patient outcomes, quality and total hospital cost of care (silo approach)
 - Still no measure of the overall effectiveness and value of pharmacist patient care services
 - Need to continue to strike a balance between productivity, cost, efficiency, quality, satisfaction and outcomes measures
 - Only way to improve is by going down



Philosophies for Success

- ❖ Medications are good investments
- ❖ Clinical pharmacy services are good investments
- ❖ Quality and safety drive efficiency
- ❖ Engage physician leaders in decision making
- ❖ Work to tie pharmacy performance to achievement of organizational goals as alternative to external benchmarking
- ❖ Set annual cost reduction goals and achieve them



Philosophies for Success

- ❖ Your budget is a plan, not a suggestion
 - Manage expenses and productivity to budget
- ❖ Accurate and rational budgeting and forecasting
- ❖ Sell the 80:20 rule
- ❖ Explain and actively manage variances
- ❖ Understand the impact of pharmacy resources on both the revenue and expense sides of the hospital business
- ❖ Set high performance expectations for pharmacists around cost management



Conclusions

- ❖ Challenges are numerous
- ❖ Benchmarking solely on labor productivity ratios will eventually lead to the demise of the profession
 - Quality costs more!
- ❖ Need new ways to demonstrate the “overall” value of pharmacist patient care services
- ❖ For cost/efficiency comparison purposes, internal productivity monitoring is much more valuable than external benchmarking (see 2010 AJHP white papers)

- Rough SS, Mcdaniel M, Rinehart JR. Effective use of workload and productivity monitoring tools in health-system pharmacy, part 1. *Am J Health Syst Pharm*. 2010;67(4):300-11.
- Rough SS, Mcdaniel M, Rinehart JR. Effective use of workload and productivity monitoring tools in health-system pharmacy, part 2. *Am J Health Syst Pharm*. 2010;67(5):380-8.



Polling Question



In benchmarking, pharmacy data is often extracted and compiled under one entity including both inpatient and outpatient data?

- A. True
- B. False



Polling Question



In benchmarking, pharmacy data is often extracted and compiled under one entity including both inpatient and outpatient data?

A. True

B. False



References

- ❖ Arrington DA, Summerfield MR. Cost analysis and control. In: Brown TR, Smith MC, eds. Handbook of institutional pharmacy practice: administration and management. 2nd ed. Bethesda, MD: American Society of Hospital Pharmacists; 1986:128-37.
- ❖ Brink HL, Naseman RW, Porter K, Reed EE, Tubbs C. An evaluation of acuity adjustment metrics to track medication expense over time. *Am J Health Syst Pharm.* 2015 Dec 15;72(24):2157-65. doi: 10.2146/ajhp140755. PubMed PMID: 26637515.
- ❖ Camp RC, Tweet AG. Benchmarking applied to health care. *Jt Comm J Qual Improv.* 1994; 20:229-38.
- ❖ Charrois TL, Johnson JA, Blitz S et al. Relationship between number, timing, and type of pharmacist interventions and patient outcomes. *Am J Health-Syst Pharm.* 2005; 62:1798-801.
- ❖ Enwere EN, Keating EA, Weber RJ. Balanced scorecards as a tool for developing patient-centered pharmacy services. *Hosp Pharm.* 2014;49(6):579-84.
- ❖ Granko RP, Poppe LB, Savage SW, Daniels R, Smith EA, Leese P. Method to determine allocation of clinical pharmacist resources. *Am J Health Syst Pharm.* 2012 Aug 15;69(16):1398-404. doi: 10.2146/ajhp110510. PubMed PMID: 22855106.
- ❖ Huntington N. Benchmarking in health system pharmacy: experience at Glen Falls Hospital. *Am J Health-Syst Pharm.* 2000; 57(suppl 2):S21-4.
- ❖ Kalman MK, Witkowski DE, Ogawa GS. Increasing pharmacy productivity by expanding the role of pharmacy technicians. *Am J Hosp Pharm.* 1992; 49:84-9.
- ❖ Knoer SJ, Could RJ, Folker T. Evaluating a benchmarking database and identifying cost reduction opportunities by diagnosis-related group. *Am J Health-Syst Pharm.* 1999; 56:1102-7.
- ❖ Krizner K. Benchmarking helps attain the delicate balance between cost and quality. *Manag Healthc Exec.* 2003; 13(9):36-8.
- ❖ Krogh P, Ernster J, Knoer S. Creating pharmacy staffing-to-demand models: predictive tools used at two institutions. *Am J Health Syst Pharm.* 2012;69(18):1574-80.
- ❖ Lada P, Delgado G Jr. Documentation of pharmacists' interventions in an emergency department and associated cost avoidance. *Am J Health-Syst Pharm.* 2007; 64:63-8.
- ❖ Lass G, Frandsen J. Hospital pharmacy data: hospital activity. *Pharm Pract Manag Q.* 2000; 19(4):1-6.



References

- ❖ Ling JM, Mike LA, Rubin J et al. Documentation of pharmacist interventions in the emergency department. *Am J Health-Syst Pharm*. 2005; 62:1793-7.
- ❖ McAllister JC. Collaborating with reengineering consultants: maintaining resources in the future. *Am J Health-Syst Pharm*. 1995; 52:2676-80.
- ❖ McCreadie SR, Callahan BL, Collins CD et al. Improving information flow and documentation for clinical pharmacy services. *Am J Health-Syst Pharm*. 2004; 61:46-9.
- ❖ Murphy JE. Using benchmarking data to evaluate and support pharmacy programs in health systems. *Am J Health-Syst Pharm*. 2000; 57(suppl 2):S28-31.
- ❖ Naseman RW, Lopez BR, Forrey RA, Weber RJ, Kipp KM. Development of an inpatient operational pharmacy productivity model. *Am J Health Syst Pharm*. 2015;72(3):206-11.
- ❖ Pawloski P, Cusick D, Amborn L. Development of clinical pharmacy productivity metrics. *Am J Health Syst Pharm*. 2012;69(1):49-54.
- ❖ Robinson NL, Stump LS. Benchmarking the allocation of pharmacists' time. *Am J Health-Syst Pharm*. 1999; 56:516-8.
- ❖ Rough SS, Mcdaniel M, Rinehart JR. Effective use of workload and productivity monitoring tools in health-system pharmacy, part 1. *Am J Health Syst Pharm*. 2010;67(4):300-11.
- ❖ Rough SS, Mcdaniel M, Rinehart JR. Effective use of workload and productivity monitoring tools in health-system pharmacy, part 2. *Am J Health Syst Pharm*. 2010;67(5):380-8.
- ❖ Sayles TJ. Documentation of pharmacists' interventions and associated cost savings. *Am J Health-Syst Pharm*. 2004; 61:838-40.
- ❖ Simonian AI. Documenting pharmacist interventions on an intranet. *Am J Health-Syst Pharm*. 2003; 60:151-5.
- ❖ Strand LM, Cipolle JR, Morley PC. Documenting the clinical pharmacist's activities: back to basics. *Drug Intell Clin Pharm*. 1988; 22:63-7.
- ❖ Summerfield MR, Go HI, Lamy PP et al. Determining staffing requirements in institutional pharmacy. *Am J Hosp Pharm*. 1978; 35:1487-95.
- ❖ Witt MJ. Improving group practice performance with benchmarking. *Healthc Financ Manage*. 2001; 55:67-70.
- ❖ Zimmerman RS. Hospital capacity, productivity, and patient safety—it all flows together. *Front Health Serv Manage*. 2004; 20(4):33-8.



Survey Results



Question & Answer (20 minutes)



Lunch Break (90 minutes)



Case Overview and Small Group Activity (50 minutes)



Case Report Out and Group Discussion (30 minutes)



Final Summary and Q&A (10 minutes)

