

# Medication Use Benchmarking Toolkit

Created by the Section Advisory Group on Medication Management  
ASHP Section of Inpatient Care Practitioners



## Introduction to Benchmarking

Benchmarking is an essential component to managing the business of healthcare. The Joint Commission defines benchmarking as a “measurement tool for monitoring the impact of governance, management, clinical and logistical functions.”<sup>1</sup> In simple terms, it is comprised of various methods and standards that help illustrate key performance indicators throughout a healthcare organization, allowing organizations and external agencies to compare data and results amongst its peers and observe performance trends over time. This allows healthcare organizations to implement changes, maintain quality of care and strengthen interdisciplinary relationships.

Due to the diversity amongst pharmacies and hospitals, there is no current pharmacy practice model that is applicable for benchmarking usage everywhere. Yet, there are common indicators that have been used repeatedly over time and have proven effective. According to author Joni Orand in her article titled “Most Important Metrics for a Healthcare Quality Management Dashboard”, common clinical metrics that are utilized in health care today include: hospital acquired infections, sepsis bundle compliance, antibiotic resistance rates, patient safety compliance and patient satisfaction<sup>2</sup>. However, before assessing these metrics one must truly understand why benchmarking is vital and how to identify valuable, pharmacy specific metrics. Benchmarking is needed because it provides a continuous process of measuring products, services, and practices against peers and those recognized as industry leaders. Benchmarking helps create strategies and prioritize resources that will be used for quality improvement, such as changes that will lead to better patient outcomes, improved system performance and better professional development. It also measures and compares clinical outcomes across organizations and enables organizations to learn from one another and apply best practices. Without benchmarking, there would be no mechanism to detect unwarranted variation from ideal state or highlight areas for improvement that are preventing an organization from reaching its full potential.

Table 1. Suggested steps for successful benchmarking

1	Select the service or activity to be reviewed through benchmarking
2	Determine whether internal or external benchmarking is most appropriate
3	Identify key indicators to measure and set performance targets
4	Collect and validate the data
5	Measure performance
6	Identify and address challenges with data and/or performance
7	Implement changes to improve results
8	Communicate results, including how to interpret performance
9	Repeat process to ensure continuous quality and/or process improvement

Determining whether to benchmark internally or externally for a given metric is a decision made on a case-by-case basis. Internal benchmarking follows the progress of the department over time compared to its past performance and tracks it towards a self-defined ideal state. Since internal benchmarking does not require the collection or standardization of data from outside organizations, it allows greater flexibility to the organization in choosing which metrics to track. Internal metrics recommended for consideration by the American Society of Health System Pharmacy (ASHP) in “So You Want to Perform Internal Benchmarking” include storage, retrieval, and preparation of medication orders (orders placed, line items ordered and shorted and IV admixtures); drug distribution processes (locations served, automatic dispensing cabinet (ADC) loads, unloads and refills, ADC turnaround time and carousel activity); order management (total orders entered, average order turnaround time, order scan volume

and order by hour) and clinical involvement (clinical interventions, medication reconciliations performed, clinical trigger events (or “clinical rules”) and pharmacoeconomic projects).<sup>3</sup>

When performing external benchmarking, an organization can draw comparisons between itself and other similar organizations. The comparable party must have similar attributes to be a relevant comparator. The comparable party must have similar pharmacy workflow and workload, a similar practice model, similar processes being evaluated, a similar patient demographic, provide similar core clinical services (e.g., transplant, oncology, cardiology), and service a similar population size. When documenting any changes or plans, it is important to incorporate any changes with results applicable to new technology, new patient care areas, and any variation in patient volume. According to ASHP, from the presentation on “Benchmarking and Productivity, Leveraging Data to Drive Results”, some common external benchmarking metrics to follow include cost-based ratios and labor productivity ratios. Cost-based ratios may include total pharmacy cost per adjusted discharge, drug cost per adjusted discharge and labor cost per adjusted discharge. Labor productivity ratios may consist of hours worked per adjusted discharge or patient day, hours worked per adjusted discharge or patient day, FTEs per order processed (or doses billed, or occupied bed), and pharmacists per 100 beds.

Internal and external benchmarking both provide crucial information regarding operational and financial measures to call out the successes and improvement opportunities of an organization. Operational benchmarking correlates directly with resource utilization, performance improvements, efficiency, and cost control. Financial benchmarking, on the other hand, pertains to managing operations to established budgets, tracking success of cost-savings initiatives, and proper allocation of staff based on workload volumes.

Ultimately, benchmarking is vital to quality improvements in healthcare. In a review by Willmington et al., “The contribution of benchmarking to quality improvement in healthcare”, the authors aim to synthesize evidence regarding the relationship between benchmarking and quality improvement.<sup>4</sup> In most of the studies, at least one intervention complementary to benchmarking was undertaken to stimulate quality improvement. Interventions ranged from meetings between participants to quality improvement plans and financial incentives. Participants varied from individual clinicians to hospitals. Benchmarking activities were mostly conducted at a national level: either covering an entire territory or selected regions. Only one initiative was implemented at the international level. Meetings among participants were the most frequently used strategy by benchmarking initiatives to support performance improvement, followed by quality improvement plans, pay for performance schemes, provision of guidelines and audit and feedback. In 14 out of the 17 studies evaluated, outcome measures were analyzed over time. Twelve of these studies reported significant improvement on outcome measures, which focused on mortality and post-surgery complications, followed by outcomes for diabetic patients and hospital length of stay. Evaluation of performance on process indicators over time was also conducted in over half of the studies. This is helpful as there is currently no standardized pharmacy practice tool to be used for benchmarking worldwide, thus a systematic review consisting of compilations of different pieces of literature from different agencies and resources combined on the topic, makes this quite applicable to many healthcare facilities and agencies. Upon data analysis and reports, it was determined that the practice of benchmarking does in fact stimulate quality improvement, and interventions complementary to benchmarking help to reinforce improvements and solutions throughout an organization.

It is important to also note that these are some of the basic metrics that ASHP recommends utilizing and every healthcare organization will abide by their own metrics as they see fit even if they are not listed

above. As we continue to learn about benchmarking, we begin to get a better perspective on why this process is a necessity to the success of an organization and ultimately a pharmacy.

The remainder of this toolkit will provide benchmarking examples – incorporating clinical, operational and financial metrics – as well as proposed methods for evaluating the associated metric.

## Clinical Benchmarking

### **Example Clinical Metric #1:**

Average time to completion for items in the pharmacy message queue.

### **Why**

Inpatient pharmacy departments receive workload inputs in a variety of ways - via the order verification queue, phone calls and pages, label printers, and in some pharmacies, message queues. Message queues are used to send requests for work to be completed by a group of staff who jointly manage the queue. Examples of messages that are sent to a queue may include requests to pharmacy to renally adjust medications, activation of pharmacy-to-dose protocols, retiming critical medications, request for medication doses, or adjusting anticoagulants prior to a procedure.

While the workload that flows into a message queue may be just as impactful as work entering the pharmacy from other routes, because it is not as demanding of the pharmacists' attention, it is more likely to go unaddressed. To that end, it is important for departments that utilize a message queue to routinely monitor the time it takes for messages to be addressed.

### **How**

- Ensure all staff understand message queue workflows and that there is alignment with electronic medical record (EMR) documentation and actual practice (e.g., staff do not mark a task as “complete” until it is truly complete)
- Obtain baseline statistics for time to completion of messages received by the pharmacy.
- Categorize type of message, clinical practice area, and responsible party (e.g., does one particular unit manage all of the messages for their patients, while central pharmacy manages messages for the rest of the hospital) to discover areas with most opportunities for improvement.

### **Optimization:**

After assessing current state, set goals that place appropriate priority on the message queue based on their clinical nature. Goal completion time may be a simple time frame, a percent reduction from baseline, or in comparison to another workload timeliness metric (e.g., time to message completion should be within 20% of average order verification time). In addition to targeting improvement through calling attention to the message queue, leaders should work to optimize the queue by ensuring that only pertinent messages reach the queue, and that staff are not working through erroneous messages which not only decrease perception of the importance of this body of work, but also create delays in completion.

### **Example Clinical Metric #2:**

Proportion of patients with a complete and accurate admission medication history completed by a pharmacy technician.

### **Why**

Medication histories help to identify the one source of truth for medication reconciliation. The list provides the prescriber with baseline information to assess and utilize for an admission and discharge medication reconciliation. Inaccurate lists or discrepancies on the lists can result in improper prescribing or medication errors while in the hospital or after discharge.

Obtaining a medication history is a time-intensive process, but one that has been effectively delegated to technicians in many hospitals across the country. While successful technician-led medication history programs have well established training and initial competency requirements, a gap may still exist in objectively assessing continued competency and attention to detail in this body of work. Assessing continued competency is especially important for practice areas where technicians are documenting medication histories without direct pharmacist oversight, or where the medication history collected by a technician may be used by a prescriber before being reviewed by a pharmacist.

### **How**

- Obtain list of recent patient encounters where a medication history was completed by a pharmacy technician.
- Auditing pharmacist selects patient for review and conducts a separate and complete (per institutional standards) medication history, which is then considered the *Gold Standard Medication History*
- Auditing pharmacist compares the medication history prepared by the pharmacy technician to the *Gold Standard Medication History* and evaluates it on the following criteria.
  - *Total number of meds obtained by pharmacy technician*
  - *Number of omissions deemed intentional versus unintentional*
  - *Number and type of variances*
  - *Number of opportunities to be correct (4 per med (med, dose, route, frequency))*
  - *Number of correct opportunities*
  - *(Number of correct opportunities/total number of opportunities) x 100= percent accuracy*
- The findings from the audits are then shared with the individual pharmacy technicians for improvement efforts.

### **Optimizing**

For organizations that adopt this auditing approach, an important first step is determining the time it takes for the auditing pharmacist to complete the work. From there, the department can allocate resources to this body of work in a way that it aligns with organizational priorities. Organizations may choose to prioritize practice areas based on patient complexity, level of technician oversight, or places where concerns have been previously raised. In completing these audits, the auditor should consider the incidence that a patient may provide separate information during the two interview sessions. Additionally, the results of the audits should not only be used for feedback to the specific employee, but also be trended so that gaps in training may be recognized and addressed.

### Example Clinical Metric #3:

Measure and monitor antimicrobial drug use as part of the antimicrobial stewardship program and identify appropriate use, dose, and duration.

#### Why

Antimicrobial stewardship programs provide antibiotic monitoring in a prospective manner. There are many opportunities for de-escalation and dose optimization that the pharmacist can intervene on before action is taken by the providers. Some hospitals opt to default limits to days of antibiotic therapy (e.g., seven days) to prevent inappropriate prolonged therapy. Providers may change this default during order entry, but many times this is overlooked. Because some antibiotic regimens call for treatments shorter or longer than 7 days (e.g., post-operative antibiotics or [insert indication with >7 days of therapy]), there is a risk that the default restriction does not accurately reflect best clinical practice.

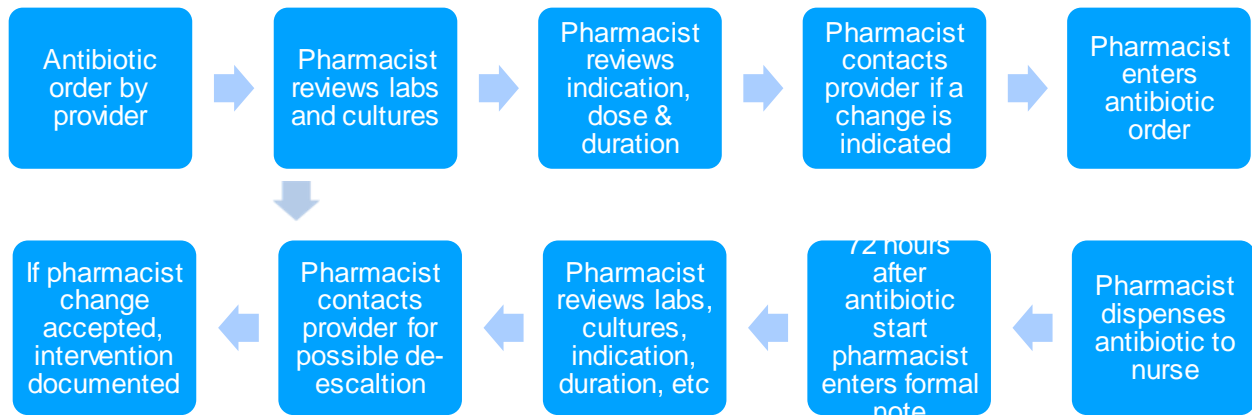
Pharmacists can have clinical impact on outcomes regarding optimization of antimicrobial drug therapy.

#### How

A “Antimicrobial Stewardship Monitoring” note will be entered every 3 days by the pharmacist, starting at the 72-hour mark, for every admitted patient on an antimicrobial. The clinical pharmacist includes (at a minimum) the following information:

- Indication
- All antimicrobial therapies the patient has been on/currently remains on (include dates)
- Lab information (micro results, vitals, pertinent complete blood count information and renal function)
- Discussion of therapy optimization (e.g., de-escalation, alternative antimicrobials)
- Number of days the patient has been on therapy

*Process of an antimicrobial drug order with pharmacy monitoring:*



#### In Addition:

Pharmacy will compile the number of antimicrobial drug interventions entered by the clinical pharmacist. Pharmacy can use these data to make decisions on how much time clinical pharmacists are requiring completing antimicrobial stewardship in addition to their other responsibilities – ensuring adequate staffing resources. Additionally, this process can be utilized to meet Joint Commission standards for antimicrobial stewardship.

## Operational Benchmarking

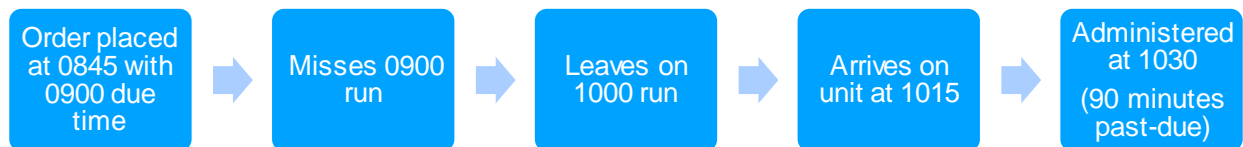
### Example Operational Metric #1:

Average time from *order verification to due time* for medications prepared in and delivered from a centralized pharmacy location.

### Why

The EMR will default a due time for a new medication order based on the time the order is placed by the ordering user. The default lead time (gap in time from order entry to due time) is determined globally by the organization but is commonly set as the next hour. In the case where a medication must be delivered from the central pharmacy, especially in a facility which allows the nurse to administer a routine medication up to 60 minutes prior to due time, it is not possible for the pharmacy to deliver the medication before it is requested by the nursing staff. The ensuing missing medication requests are a disruption to pharmacy workflows and delay the eventual delivery and administration.

*Life-cycle of a first-dose dispensed from central pharmacy:*



*Life-cycle of a first-dose with an adjusted due time dispensed from central pharmacy:*



### How

- Limit to orders due within 4 hours of order entry to avoid outliers for medications intentionally ordered for a later date or time.
- Consider excluding medications prepared in the IV room, as these are more likely to be clinically timely.
- Include or exclude specific areas of the hospital based on your patient population (e.g., excluding newborn ICU if you want to treat all orders as urgent).
- Guide staff to use clinical judgement to modify the due time to set reasonable expectations that take your delivery schedules and nursing practices into account (e.g., hour +2 or +3 for pharmacies that perform hourly runs in hospitals where nurses may administer medications up to 60 minutes in advance).

### Optimization

To minimize missing medication requests and phone calls to pharmacy, target a house-wide average between 2-3 hours. Share results regularly with staff. Additionally, consider trending missing medication requests along with the *order verification to due time* metric to see the true impact on central pharmacy workload.

## Financial Benchmarking

### Why

Financial benchmarking provides valuable opportunities to better understand trends related to utilization of resources over a specific period for healthcare organizations. Drug spend is oftentimes a major component of a hospital or health-system's overall budget and can significantly affect the operating margin. Detailed oversight of pharmacy spend is warranted to ensure the delivery of value to stakeholders. Value is often defined as outcomes per dollar spent and requires careful attention to defining health outcomes appropriately, accurate prediction of the delivery cost and routinely measuring both of those metrics.

### How

Financial benchmarking may involve internal review where specific metrics are measured and tracked over time to identify trends. Comparison between individual hospitals within a health-system may also be able to help identify outliers in spend or resource utilization, which can be helpful for project prioritization.

Competitive benchmarking, in comparison, allows benchmarking efforts to expand outside of the organization to determine performance in various metrics. When performing competitive benchmarking, it is important to understand the similarities and differences that may exist between organizations. It is usually best to identify hospitals or health-systems with similar size, specialties, and patient populations to draw comparisons more accurately in resource utilization. Understanding limitations to data from outside sources is also important to remember when utilizing information to guide decision making.

Key steps involved in financial benchmarking include the following:

- Identify best practices
- Establish a work group or task leader to organize and analyze the information
- Identify a peer group with similar characteristics
- Select key benchmarks to review
- Identify specific opportunities for quality improvement
- Share findings with management and gain support for initiatives

Sample metrics to include in benchmarking efforts:

- Patient drug costs per stay
- Percent of cases receiving resource
- Mean days resource used per case
- Defined daily dose (DDD) resource total/per case/per case mix index (CMI)
- Total drug expenditure
- Spend per MS-DRG or by AHFS class
- Spend per service line
- Individual resource vs drug class

### Optimization

Benchmarking is imperative to include in the strategic focus for those organizations who are striving for financial success. Identification of opportunities to further explore can help establish priorities for the organizations and lead to more informed business decisions. Highlighting areas of effective utilization and high performance is also key information to share with stakeholders.



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