Effective use of workload and productivity monitoring tools in health-system pharmacy, part 2

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Purpose. The current status of external and internal workload and productivity measurement systems and strategies to improve their use to maximize overall pharmacy department operational performance and staffing effectiveness are described.
Summary. The use of operational benchmarking is increasing within health systems as a tool for continuously measuring and improving departmental performance and evaluating departmental success. Unfortunately, software used for benchmarking purposes is available through a limited number of commercial vendors and consultants, and these systems are unable to effectively measure department operations and overall performance. The theoretical value of benchmarking and productivity measurement systems, including a description of the various definitions, tools, and data sources for comparing pharmacy productivity data, is summarized. The limitations of commercially available vendor productivity monitoring systems and desired strategies for improving their use are also reviewed. Preferred productivity and cost metrics for measuring pharmacy department effectiveness are suggested, and strategies for obtaining value from external and internal productivity monitoring systems are explored.
Conclusion. Challenges with external operational benchmarking and internal productivity monitoring systems are numerous. These systems rarely measure the quality of pharmacy services provided and their effect on patient care outcomes and the total cost of care. Benchmarking vendors must modernize their software and develop internal checks to confirm data integrity in order to make their products more useful and reliable. In addition, data supporting the patient care role of the pharmacist should be integrated into all productivity monitoring systems and be used to demonstrate the positive impact of pharmacy services on the total cost and quality of patient care.

Index terms: Benchmarking; Computers; Economics; Patient care; Personnel, pharmacy; Pharmaceutical services; Pharmacists, hospital; Pharmacy, institutional, hospital; Productivity; Quality assurance; Work load
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Strategies for using an external benchmarking system

When selecting an external benchmarking system, pharmacy directors should study and understand all functional elements of the system, including required and optional data elements, characteristic questions, and normalizations. The following strategies are recommended when using an external benchmarking system:

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1. **Spend time navigating the system and understanding all element reporting options.** Determine how to build or modify a selected comparison peer group, as all vendors or systems do not have a comparison group. Instead, benchmarks or ratios are provided, and these may not be valid.
2. **Spend time with your hospital (fiscal) data coordinator to understand exactly how your department's reported data elements are derived.** Work to find ways to automate data submission as much as possible and routinely follow reported data through the system to ensure their accuracy, especially in reporting metric outputs. Such auditing work

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is a good task to delegate to a pharmacy budget manager.

3. **Review all available labor productivity and cost metrics (key indicators or ratios) within the system.** Take time to understand the definitions and mathematical formulas behind each ratio. Understand the metrics that represent your department in a favorable and an unfavorable light and why they do so.
4. **Develop systems to measure inpatient drug expenses separately from all other hospital drug expenses.** Work with your data coordinator to make sure this expense is reported accurately per vendor reporting instructions. Developing a good relationship with your data coordinator is key.
5. **Select a meaningful peer comparison group.** If your hospital has already selected a peer group, start there, but spend time investigating the appropriateness of this peer group. Limit your peer group to 15–20 organizations that are most like yours. Evaluate available characteristic survey data from these peer organizations, and call the pharmacy director in each organization to determine whether their pharmacy services reflect the implementation of best practices for achieving quality and safety. Be sure to understand the clinical services they offer, their practice model, their distribution services, their hours of service, how they report required data elements, and so forth. Compare your services with peers in terms of implementation of best practices from the literature. If you find an organization is very different from yours in terms of type or quality of pharmacy services provided, eliminate that hospital from your peer group. If your peer group has been preselected by hospital administration and you do not agree with the selection, make the argument and come prepared with suggested substitutes and an explanation of why they are more appropriate.
6. **Select the most meaningful key indicator metrics for comparing your performance with that of your peers.** Select just a few cost ratios and productivity ratios. Use the pharmacy intensity score to weight your metrics, if possible. If you are currently using patient days in your key indicator ratio denominator, consider changing this to discharges.
7. **Review your key indicator scores and compare them with the 25th, 50th, and 75th percentiles of your peer group.** Work to explain positive variances in terms of the exceptional services you provide. Also, try to identify arguments to help you explain negative variances in a positive light. For instance, if your labor cost per discharge is higher than your peers' average, perhaps this can be explained in terms of your organization providing a higher level of quality pharmacy services than most of your peer group. Or, based on your discussions with your peer group pharmacy directors, you can determine that they report data differently than you do and that this explains the difference. Use caution when arguing your scores. Never explain a variance in terms of quality unless you have data to support your argument.
8. **Develop a department expert to whom you can delegate ongoing management of the benchmarking system.** Delegate as much of the report generation to other staff so that your time can be spent on strategic planning related to improving your reported results.
9. **Develop a routine (e.g., quarterly) monitoring process to review your benchmarking results.** Make certain that your monitoring process includes data integrity checks. If a peer's reported performance appears "too good to be true," it usually is. Call the pharmacy director of that organization and ask him or her to explain the reasons behind the pharmacy's exceptional performance.
10. **Understand all the limitations of commercially available systems.** If your results are unfavorable compared with your peers, work to rule out each of these limitations as potential causes of the problem.
11. **Determine at least one opportunity to improve your overall labor efficiency and total cost performance.** Let your administrators know that you understand your data and plan to develop a specific plan to improve your performance relative to that of your peers.
12. **If pharmacy labor productivity ratios are worse than desirable, review nursing's productivity ratios versus those of your peers.** It may be possible that pharmacy staff in your organization are doing work that nurses are performing in most peer organizations. This is most likely to be the case if your department provides a 100% unit-dosing service, maintains the nurse medication administration record, provides patient medication history and medication reconciliation services, or provides patient medication teaching for inpatients.
13. **Market what you have learned.** Volunteer to provide leadership to other departments to assist them in learning to use the benchmarking system.
14. **If administration expects you to benchmark at or below the 25th percentile in terms of labor productivity, explain how performing at this "low labor level" may negatively affect patient safety and external quality score compliance and ultimately increase the total cost of care.** Work to negotiate up to the 50th percentile in terms of desired labor productivity. If your expectation is to be at or lower than the 50th percentile, work to negotiate up to the 75th percentile. Take the approach that cost management and operational efficiency are important, but be clear that you believe quality and safety must trump cost reduction in a silo. Make the argument that the best financial performance usually follows the highest quality service.

15. **Understand the benefits of internal benchmarking over external benchmarking.** Approach your administrators and educate them about the flaws of your external benchmarking system. Explore the possibility of migrating to an internal benchmarking and productivity monitoring system.

Effectiveness of pharmacy services

Examples of traditional measures used to describe pharmacy department effectiveness include pharmacy drug expenses, medication turnaround time, nursing or physician satisfaction with pharmacy services, and the percentage of accepted pharmacist clinical interventions. External operational benchmarking systems cannot analyze the impact of pharmacy services on overall patient outcomes and quality. There is currently no validated or reliable method for determining pharmacy workload and staffing effectiveness, and more meaningful metrics are needed for measuring the overall effectiveness and value of pharmacist patient care services. We need to better define the minimal standards for pharmacist patient care activities required for all patients. The extent to which these activities are implemented should serve as the measure of a department's performance rather than flawed and error-prone labor and cost metrics derived from external benchmarking systems.

We must work with vendors, consultants, and administrators to advocate for the integration of evidence-based practices into our benchmarking systems. We must conduct research to prove that organizations that spend more on pharmacist labor, technicians, and technology ultimately achieve improved outcomes and overall cost-effectiveness of care. To do this, we must draw clear linkages demonstrating that the organization's investment in best pharmacy practices (which ultimately increase pharmacy labor costs) results in reduced drug expenses, improved patient safety, avoided preventable adverse drug events, reduced lengths of stay, improved regulatory compliance, and improved customer service.

Internal benchmarking

Internal benchmarking provides a measure of self-comparison over time.[14,16,19] It is preferable to external benchmarking in that it is more controllable and eliminates many of the flaws of external benchmarking comparisons. However, it does require an up-front and ongoing internal commitment of resources to establish and maintain a system of measures and targets. Having internal productivity targets and data demonstrating positive productivity trends to compare against is helpful when responding to consultants and working with administrators to maintain or expand pharmacy labor resources. Internal benchmarking avoids inaccurate comparisons with dissimilar organizations and allows for the accurate measurement of staff activities and quantification of changes in practice and workload volume. It also helps determine the resources necessary to provide best practice clinical and distributive services within your department.

There is no accepted gold standard method for internal productivity monitoring. The key is to strive for numbers that are validated, accurate, and applied consistently over time to assess the state of your department in terms of workload and demonstrated efficiency. A good internal productivity monitoring system will enable a pharmacy director to demonstrate improved performance in terms of operational efficiency over time by monitoring workload and cost metrics and will provide objective data when requesting new FTEs by quantifying total pharmacy workload over time to demonstrate positive trends. Depending on your institution, you may be able to use simple metrics or productivity ratios (Table 2) and avoid the complexity of patient acuity and revenue factor adjustments. Ideally, when using simple metrics, the data may be reported in an automated fashion via a pharmacy or hospital information system, leading to consistent, relevant, and meaningful reporting.

Work measurement. In order to develop a data-rich internal benchmarking system, pharmacy directors must have a good understanding and functional knowledge of work measurement methods. Time–motion studies may be useful in determining the resources necessary to complete a task or set of tasks.

A time standard (i.e., the mean time required to perform a task) can be developed by direct observation, self-reporting, work sampling, or adopting a time standard from a similar organization.[16,19] A volume indicator (i.e., the mean frequency of a reported task) may be routinely obtained in an automated fashion from the pharmacy computer system. This

Table 2.
Suggested Internal Pharmacy Benchmarking Productivity Monitoring Indicators[a]

Worked hours per unit of service
Drug cost per admission
Labor cost per admission
Total cost per admission
Doses dispensed per admission
Labor expense per 1000 doses billed
Pharmacist worked hours per order[b]
Technician worked hours per dose[c]
Inventory turns per year
Clinical interventions per pharmacist shift worked
Pharmacist:technician skill mix ratio
Pharmacy cost as a percentage of total hospital costs

[a]Avoid using patient days in the numerator; admissions is a better predictor of pharmacist workload and drug expenses.
[b]Orders usually drive pharmacist workload more than doses.
[c]Doses usually drive technician workload more than orders.

information can also be obtained from the hospital's records of patient admission, discharge, or transfer or the hospital's admissions and patient billing systems.[16] Self-reporting of activities such as documentation of pharmacist clinical interventions may be needed. Multiplying a time standard for a task by the volume indicator for that task provides the total time required to perform that task.

Direct observation. A good method for establishing a time standard is to perform a series of direct observations of a task, determine the average time required to complete the task, and establish a standard deviation to the mean measurement. After time standards and volume indicators are established for the majority of tasks that drive workload, the total time requirement for each major activity can be determined. Before initiating time standard or volume indicator measurements, the activities you are intending to measure must be clearly defined.

To conduct a direct observation time study, an observer does not interfere with the worker being observed (to avoid the Hawthorne effect) but records the start and stop times of when activities occur with a stopwatch. Direct time studies are best used for high-volume activities with clearly defined start and stop times and that are short in duration. When conducting a direct observation time study, the staff to be observed are notified at the start of the activities being measured. They may help to notify observers when a task is about to begin. It is recommended that a team approach be taken to define a list of staff activities, understanding that some activities may differ across patient care types. Direct observation time studies are often used because the data collected are easily transferred into a simple metric where the determined time standard (e.g., time required to enter a medication order) is multiplied by the volume indicator (e.g., number of medication orders) to generate the total staff time requirement for each specified activity over a period of time (e.g., total time required to enter medication orders), usually in total minutes or 100 workload units (WLU).

The direct observation time study method is not without limitations. Some limitations include observer influence over the pace of activities, observer variability, the large number of observations required to generate statistically valid time standards, and time constraints resulting in a limited sample size. It is crucial to include both clinical and distributive activities, establish definitions, and have the staff validate these definitions before performing time standard measurements.

Self-reporting. In contrast to direct observation, the self-reporting method relies on staff members to document the amount of time required to perform an activity. Self-reporting studies are generally conducted for activities with low-to-moderate volume that have clear start and stop times. However, there are several common flaws associated with the self-reporting method. Inaccurate reporting can occur if the staff member does not understand the true definition of the task being studied. There can also be unintentional skewing of data in an attempt to achieve results that staff perceive as desired (e.g., this may explain why there may be 12 hours of work documented for an 8-hour shift). In addition, it can be difficult to accurately self-report time requirements during periods of peak workload. For these reasons, self-reporting should be avoided when possible.

It is important to note that direct observation and self-reporting may be used to generate volume indicators in addition to time standards. However, as stated above, pharmacy directors should strive for volume indicators produced directly from pharmacy or hospital reports.

Work sampling. Work sampling is an indirect method of establishing time requirements.[11,16,19] It does not involve actual timing of individual activities but estimates the amount of time spent in various activities. The premise is that a random sample of instantaneous observations at random times has the same amount of observations as the entire segment. The work-sampling method is ideal for measuring the relative frequency of all tasks staff perform and for measuring intermittent activities in which events are not closely structured in time, occur infrequently, and require an inordinate amount of time to collect data for via direct observation. When conducting a work-sampling study, the study coordinator predetermines a list of activities to be measured and designs a data collection form for pharmacy staff based on that information. Pharmacy staff members (i.e., study participants) are provided with the data collection forms and a pager. A random time schedule is created, and pagers are synchronized with this schedule to notify the participants of data collection times. When the pager signals, the study participants simply note via a check mark on the data collection form the activity they are performing at that point in time. When all data collection forms are returned, the study coordinator tallies the total number of check marks for each task and the total number of check marks for all tasks. Next, the total number of check marks for all tasks is divided by the number of check marks for each task to generate the percentage of check marks for each task. That percentage is assumed to be equal to the percentage of employee time spent on that task. This information may be extrapolated to a time standard for each task. Consider the following example: There are a total of 10,000 pharmacist hours in a week at a particular institution. During the sampling period, 10% of the total number of

check marks recorded fell under the category of order entry. This means that 1,000 hours per week (10% of 10,000 hours) and thus 142.85 hours per day were dedicated toward order entry. Subsequently, the institution reports a volume indicator revealing that, on average, staff enter 5,000 orders per day. The 142.85 hours (from above) are converted into minutes (i.e., 8,571 minutes) and divided by the 5,000 orders entered per day. This calculation reveals that, on average, order entry requires 1.71 minutes (1 minute 43 seconds) per order. This time standard for order entry can then be multiplied by the volume indicator (number of orders entered) to determine the WLUs associated with order entry.

Work sampling can be used to determine the effects of implementing a new system and its impact on staff time (e.g., measuring a desired shift from distributive to clinical activities). This method is also useful for establishing a productivity monitoring system that incorporates a very large number of tasks performed by staff when the resources required for direct observation are not available.

Issues to consider. Care must be taken when combining various activities such as order types (e.g., entry of new, modified, and discontinued orders) in developing time standards for workload measurement. Work measurement theory would dictate that different order types (or different activities) be divided into separate time standards to make such standards statistically meaningful. The closer the standard deviation is to the mean, the more accurate is the time standard. The most reliable time standards have a standard deviation within 5–10% of the mean. The standard management engineering perspective is that a time standard for a task is usually constructed by conducting a number of observations to develop an average time requirement in minutes or seconds, unless the work-sampling technique is being used. The required number of observations depends on the desired precision (e.g., standard deviation of the mean). Usually, for management engineers, hundreds or even thousands of measurements are required for a task under a number of different conditions (e.g., weekends, weekdays, evenings, days, different staff members). Assuming the standard deviations are low, a time standard that has been engineered and validated is fairly accurate. Time standards developed like this are valid for the place and under the conditions in which they are constructed. Extrapolation of these standards to other departments with other workers, conditions, logistics, or facility considerations must be done carefully. However, there is often an administrative need to use a time standard developed in one facility in other environments. This can be done, but the flaws in this approach must be recognized. The use of a time standard for select activities (e.g., order entry, compounding, obtaining a medication history) from a different organization or even across different patient care areas within a hospital may not be completely accurate if used to determine precise staffing needs; however, this approach can be good enough for establishing an internal productivity monitoring system in a pharmacy department. Before officially adopting borrowed time standards, 10–20 direct observations of each task should be performed in your own organization to confirm that the borrowed time standard is within 25% of the observed time requirement in your organization. The borrowed time standard will be more valid if used consistently over time to approximate trends in total time requirements and relative resource needs. In other words, use these estimated time requirements as a compass to help gauge relative staffing needs over time and not as a thermometer to determine precise productivity ratios.

No system will be able to measure or accurately quantify all tasks with complete accuracy. Some uncertainty exists for all tasks that are reported, as downtime and nonproductive times exist (e.g., bathroom breaks, walking between care areas). Whenever using time standards to determine staffing requirements, it is important to note that there may be wide variation in activity time requirements based on patient type and interruptions (e.g., telephone calls, stopping to check doses, stopping to answer a drug information question). A pharmacist who is uninterrupted when entering medication orders, for example, will be able to process a significantly greater number of medication orders per hour than a pharmacist who is interrupted throughout that hour. However, in this scenario, it would be inappropriate to draw conclusions about either pharmacist's productivity without factoring in clinical interventions and other types of interruptions. Due to differing staffing models, it would be impossible to develop a standard across various hospitals for an acceptable number of orders that a pharmacist should enter per hour or per shift.

Getting started. Developing an internal benchmarking system may seem daunting, but it is important to remember that there are generally a few core activities that constitute most of the total staff workload. Examples include but are not limited to obtaining medication histories, providing medication counseling, checking medication doses and adjusting them as needed, documenting and avoiding drug allergies or interactions, participating in patient care rounds, and providing pharmacokinetic services. Initially, it may be best to start with monitoring a few pharmacists and technicians to keep the project manageable and then increase the number of included activities and staff involved.

Next, determine how workload (volume and time requirement)

will be measured for each task, and consider possible available resources for workload measurement such as pharmacy students, pharmacy residents, or industrial engineering students. An initial solution may include borrowing time standards from other organizations or utilizing a Delphi process whereby time standards are developed by pharmacy staff representing an internal expert panel for consensus of agreed-on values. A classic Delphi process involves a facilitator presenting panel members with a series of specific questions (in this case, time-standard-based questions) in which responses are collected anonymously and then averaged. Based on the average response, panel members are given the opportunity to change answers and a new average is subsequently developed. This process is repeated until a consensus response is achieved. A modified Delphi process mirrors the classic Delphi process in that an average consensus of a metric is determined. However, after that metric is determined, a small-scale direct observation study (e.g., 10–20 observations) is conducted on a small sample of data for each task to internally verify the average consensus that was made by the expert panel. If this study confirms the expert panel consensus average, the metric (e.g., time standard) is then considered validated. If the direct study is in disagreement with the consensus average, the modified Delphi process is repeated until consensus can be reached and validated by a small number of observations.

After determining the data collection and extraction methods to use, review your plan with staff. Get their endorsement of the numbers to be used, and incorporate a continuous feedback loop in the event that the data may unintentionally lead to a misrepresentation of true workload. Upon acceptance of the benchmarking methodology, develop a monthly reporting system with subsequent communication of total workload to the institution's fiscal department each month for incorporation into the pharmacy budgeting process. Use these workload statistics to demonstrate efficiencies gained over time and assist in demonstrating increased workload to justify new staff requests.

Another useful strategy in creating an internal benchmarking or productivity monitoring system is to separate each functional area of the department. For example, consider a separate productivity monitoring system for the sterile products area, repackaging area, purchasing activities, and decentralized clinical services provided. For the department as a whole, attempt to streamline this process by combining total workload from each smaller part of the department into one or two high-level numbers for each major cost center (e.g., the inpatient pharmacy cost center) so that administration sees one workload number for each pharmacy cost center and perhaps one for the entire department. Consider using a combination of both broad and specific activities that have time standards and volume indicators determined to be associated as combined workload for centralized and decentralized workload budgets. Some specific activities have dedicated time standards, while more-broad activities (e.g., intensive care unit patient day) have time standards that are representative of several smaller activities combined into one (eFigure 1, available at www.ajhp.org).

The previously described methods are often laborious and require resources that may not be available within the pharmacy department. A good strategy is to contract with an industrial engineer to outsource the development of an internal productivity monitoring system as described in this article.

Intervention reporting. The pharmacy literature is rich with publications describing methods for documenting pharmacist clinical interventions and for estimating the value of these interventions.[29-41] While pharmacy workload and productivity measurement systems collect various types of statistics, they often do not account for the various clinical functions performed by pharmacists.[22]

Health-system pharmacists are often placed in the difficult position of having their practice environment or pharmacy department benchmarked against the productivity values and standards of another health care organization. This creates a paradox, since there is not a common documentation method for pharmacist clinical interventions within the practice of health-system pharmacy. In addition, there are no common validated methods across the continuum of health-system pharmacy practice to measure the economic effect of pharmacist clinical interventions on an ongoing basis.

Improved workload and productivity measurement methods are needed for the clinical component of pharmacy practice. This is particularly crucial as the profession of pharmacy evolves toward a cognitive-based profession. The clinical functions performed by pharmacists may actually reduce the numbers of traditional production-related items measured by pharmacy workload and productivity systems. Therefore, comprehensive measurement and benchmarking statistics of pharmacy workload and productivity must integrate both production and clinical metrics.

Evidenced-based algorithms assessing the financial impact of pharmacist clinical interventions need to be developed. Examples of clinical areas for algorithm development include i.v.-to-oral conversions, dosage adjustments for renal insufficiency, drug information, pharmacokinetic services, avoidance of allergy and adverse drug reactions, order clarifications, and patient education. The algorithms must allow

health care organizations to include unique financial data to determine the economic impact of pharmacist clinical activities at specific facilities. The algorithms must be adjustable to reflect the effect of developments with medication safety processes, particularly when such new processes may cause a statistical decrease in workload productivity.

Health care organizations must acknowledge that the clinical function of the pharmacist may increase drug costs to the pharmacy department while reducing overall costs to the health care organization, due to more effective use of medications, shorter lengths of stay, or fewer comorbidities. Pharmacy productivity metrics such as the number of doses dispensed or administered will need to be modified to reflect the elements of pharmacists' clinical activities.

Common automated methods to document and measure pharmacist clinical interventions are needed. Often, the documentation of clinical interventions depends on pharmacist self-reporting. The productivity value derived from self-reporting systems may be lower than the actual value during times of high workload. Automated systems that provide for the ongoing documentation of pharmacists' clinical interventions during the course of a pharmacist's work experience may resolve the problem of clinical intervention underreporting.

The therapeutic and financial outcomes of the clinical services provided by pharmacists must be communicated to the major stakeholders associated with drug therapy within the health care organization. Administration, finance, prescribers, risk managers, nurses, laboratory staff, and other clinicians are stakeholders who are directly affected by the clinical activities of pharmacists. The acknowledgement of the clinical pharmacy service value by these stakeholders is essential to understanding workload metrics and benchmarking with other health care organizations and for continuing and expanding clinical pharmacy services.

Balanced scorecards and dashboards

A balanced scorecard tracks key metrics grouped according to a set of broad performance areas over time that represent an evenhanded view of an organization or institution. A dashboard is a graphic representation of a balanced scorecard. Performance areas may include but are not limited to financial health, operational efficiency, customer service, employee satisfaction, external quality standards, clinical effectiveness, and quality. A balanced scorecard allows for the identification of measures consistent with the organization's strategic goals to be tracked over time and for the incorporation and customization of both external and internal key indicators and benchmarks.

Each broad performance area within a balanced scorecard has a designated number of selected subcomponent metrics that give a good indication of the extent to which the department's goals are met within that broad performance area. For example, if the institution sets a goal of maximizing patient satisfaction, then patient satisfaction survey goals are routinely monitored to determine if scores are improving. In this regard, it is important to improve performance by setting specific goals, and each metric will have a target. If this target is met, the performance indicator will reflect that outcome. If the target is not met, then the performance indicator will reflect less favorably on the dashboard. This method also provides a framework for unifying an organization around common goals.

It is important to note that the effective use of scorecards depends on the identification of appropriate standard metrics. A review of the literature provides an easy method of accessing and analyzing key performance indicators.[42-44] This undertaking saves time and also promotes accountability among managers. A departmental or best practice self-assessment tool may serve as the basis for a scorecard. Such a tool would consist of a series of questions that help the department identify best practices within an institution. Key quantitative measures could focus on a finite number of areas, such as patient satisfaction, resource utilization, professional growth, and employee engagement. Ideally, these measures would be expressed quantitatively, be easily understandable outside of pharmacy, and encompass a significant number of patients served.

Another good way to get started is to identify all currently reported department metrics, as well as the services you provide that most directly affect hospital strategic goals (e.g., external quality score compliance, cost reduction, revenue growth). Then, select the ones that represent the department's strategic goals. Once this is completed, draw the connection between departmental goals and high-level organizational goals. If possible, have the pharmacy's balanced scorecard results reported directly into the hospital's balanced scorecard results. Clearly communicate what is important to the institution to all staff in the department, as everyone is responsible for ensuring that these targets are met. If one of the broad performance areas is not performing as expected, the metric in need of improvement can be pinpointed. Lastly, balanced scorecards deliver evidence that selected initiatives are contributing to the organization's mission. If all of the performance areas are performing better than expected, the goals of the organization are likely being met.

Linking dashboards and internal benchmarking

The advantages of internal benchmarking and departmental dashboards are many. Even if you have a successful external benchmarking

process or if your facility is not concerned with external benchmarking, you should still develop and monitor your own dashboard of departmental indicators and internal benchmarks, because you are never more than a single leadership change away from a change in philosophy or a bad financial year. The threat of a bad financial year can bring out the external benchmarker in any senior leader. While there are many inherent difficulties with external benchmarking, the impact and relevance of internal benchmarking are significant. Internal benchmarking compares you with the only facility in the world that is exactly like yours, allows you to see exactly what is changing and what is not in your own environment, and gives you valuable tools to monitor the health of your department and its processes.

The dashboard and internal benchmarking data should meet the needs of the department of pharmacy and serve as a way to communicate to senior leadership the state of the pharmacy department. These data are a tool for internal and external communication. Your dashboard should measure the following:

- Product procurement, receiving, retrieval, and preparation processes,
- Drug distribution,
- Order management,
- Clinical practice (i.e., every act by a pharmacist that affects the management of drug therapy for the facility's patients), and
- Quality, safety, and regulatory outcomes and indicators that can be positively influenced by the pharmacy department.

Table 3 provides examples of metrics for these processes.

Summary of strategies for developing internal benchmarks

When developing an internal benchmarking process and a departmental dashboard, the goals are to document the major processes that occur regularly in a pharmacy department; document the work effort required to achieve the desired outcomes; develop a tool to track how well the various work components are functioning so that suboptimal work can be identified, corrected, and remeasured; track and trend work efforts related to changes in patient volume, new patient care areas, and technology; and measure data accurately and in relevant order for your benchmarking to have any credibility.

After the internal benchmarks have been established, the dashboard should be designed. There will likely be two sets of dashboards: one that is comprehensive and designed for use within the department and a simpler dashboard for communication outside of the department. For nonpharmacists, many of the tasks performed by a pharmacy department are not intuitive. The complexity and variety of the tasks performed on a daily or even hourly basis are poorly understood. While education of key decision-makers outside of the pharmacy on the intricacies of a modern health-system pharmacy is important, the key to a dashboard is to communicate essential information. While these essential data can vary among departments, common components of a dashboard for administrative use will likely include basic financial, workload, and quality indicators. Some administrators may want only one indicator per department, but the choice of the indicator used is not always left to the director of pharmacy. Your mandated dashboard might not include the major issue that you wish to communicate. What then?

The department will, or should, have a more comprehensive set of indicators drawn from internal benchmark measurements that will give a routine indication of the health of the department and its various systems and components. Some recommended dashboard indicators are adjusted discharges (or patient days

Table 3.
Examples of Metrics Used in Internal Benchmarking and a Departmental Dashboard

Process	Measurement
Product procurement, storage, retrieval, and preparation[a]	Orders placed, line items ordered, purchases percentage on contract, product stock-out rate, shorted items necessitating development of a substitution process, total parenteral nutrient solutions mixed, complex admixtures
Drug distribution[b]	ADC stock-out rate, ADC override rate, ADC actions performed for pharmacy (refills/loads/unloads)
Order management[c]	Orders reviewed (entered) per period, order review (entry) turnaround time
Clinical practice	Clinical documentation rate (interventions per adjusted discharge)
Other quality indicators[d]	Clinical opportunities identified versus performed
Financial outcomes	Drug expenses per statistic
Workload	Work force hours per worked unit of service, ratio of staffed versus filled positions, total 100 workload units

[a]Any significant component is fair game for measurement. It is often useful to measure something that you are unsure is working well.
[b]These data are readily available from the automated dispensing cabinet (ADC) archive process.
[c]These data should be available from your pharmacy information system.
[d]Indicators that can be positively influenced by the pharmacy department.

or whatever primary patient volume measurement is used in your institution), clinical activities, order entry or review, operating room (OR) cases (if you have an OR satellite or process OR kits), automated dispensing cabinet activity (measures loads, unloads, and refills), inpatient drug expenses, and worked hours.

A blended productivity indicator that could be used in a hospital pharmacy department combines measures from adjusted discharges, order review, OR cases, prescriptions filled, clinical activity, and automated dispensing cabinet activity to measure the overall change in workload from one period to another. Once the director has selected indicators, it is important to routinely brief the person to whom he or she reports. In these sessions, department dashboard review will consist of a dispassionate explanation of the dashboard indicator, its relevance to the department, and why the administrator should want to know about it. Opportunities for education will arise from questions asked.

A summary of an internal benchmarking effort can be formatted in a variety of ways. There are benefits to making the dashboard as visual as possible, and the options for doing so are limited only by your artistic talent and the capabilities of your software packages. There are times, however, when the graphic approach needs to be supplemented with a more basic tabular approach. Often, putting data in a tabular format (eFigure 2; available at www.ajhp.org) will be more intuitive for administrators and others. Having the data, understanding the data, ensuring the accuracy of the data, and sharing the data with others outside of the pharmacy department can facilitate meaningful conversations.

If external benchmarking is brought into the conversation, compare and contrast the data appropriately with your internal measurements. Internal benchmarking derived from such measurement gives the department tools to monitor and, when necessary, improve operations.

Conclusion

Challenges with external operational benchmarking and internal productivity monitoring systems are numerous. These systems rarely measure the quality of pharmacy services provided and their effect on patient care outcomes and the total cost of care. Benchmarking vendors must modernize their software and develop internal checks to confirm data integrity in order to make their products more useful and reliable. In addition, data supporting the patient care role of the pharmacist should be integrated into all productivity monitoring systems and be used to demonstrate the positive impact of pharmacy services on the total cost and quality of patient care.

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