Laboratory Staffing Analysis – Getting Started
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Staffing a laboratory is a common challenge—and frustration—that many managers and supervisors face in today’s environment of shrinking resources. Add a rapidly growing outreach business volume to the mix and the task can become daunting. While matching staff to workload appears to be common sense, unfortunately it is not always common practice.

Factors that Impact Staffing

Many factors need to be taken into account when determining optimum staffing levels. The following are a few common elements in addition to workload that must be considered:

- Test menu and complexity (e.g., rapid response vs. full-service laboratory).
- Hours of operation (e.g., 24 hours a day/seven days a week with on-call for night shift hours).
- Technical skills of staff (e.g., specialized vs. cross-trained).
- Staff available hours and flexibility (e.g., full-time vs. part-time).
- Patient care support (e.g., point-of-care testing or patient phlebotomy).
- Automation usage (e.g., auto-verification or electronic crossmatching).
- Level of available information technology (e.g., level of client electronic order entry).
- Regulatory requirements (e.g., CLIA and state regulations).
- Workforce requirements (e.g., union contracts, state licensing requirements).
- Budget constraints (e.g., reduced salary budget from previous year).

Staffing Approaches

Up until the early 1990s, most laboratories utilized the College of American Pathologists (CAP) Workload Recording Method (WLR) (1). This approach assigned a workload unit value to each test based on the methodology but was complex to implement and difficult to keep current with rapidly changing technology. In 1992, CAP replaced the WLR with the Laboratory Management Index Program (LMIP), a peer comparison laboratory performance tool.

Peer comparison can either be purchased from a variety of providers (2) or accomplished by networking with hospital managers in similar situations. It is important not to base comparisons solely on similarities in bed size since the information could be misleading. The more a laboratory can compare to another facility that has similar staffing factors listed above, the more likely it is able to obtain an “apples-to-apples” comparison. Since benchmarking programs are retrospective, many savvy managers will track their laboratory’s productivity on their own each pay period to have more real time data. Internal monitoring of the number of billable tests per worked hours, a common benchmark, allows ongoing evaluation of productivity and rapid review of the effect of any staffing change made to balance workload.
This high-level approach is useful to gain an overall sense of the appropriateness of staffing levels. When a laboratory experiences rapid growth, possibly due to an expansion of outreach testing, it may require a more detailed staffing analysis to assure adequate staff is available to handle the workload.

**Analyzing Workload and Staffing Levels**

The first step in matching staffing to workload begins by collecting volume data. Depending on the type of laboratory operation, volume may be expressed as billable tests, requisitions, or possibly a combination of both. An initial analysis may look at volume by day of the week using a simple bar graph (Figure 1).

![Figure 1: Volume by Day of the Week](image)

The bar graph analysis generally validates some operating assumptions, such as volumes are lowest on the weekends. The analysis may also provide new insights; in the case of Figure 1, the laboratory did not realize Wednesday volume was lower than Monday. A potential staffing response this analysis may stimulate is to schedule fewer people on Wednesday and Friday compared to other weekdays.

The next level of detail analyzed is generally volume by time of day. There are two common volume choices to capture in this type of analysis: either “time received in laboratory” when analyzing support staff or “time reported” when analyzing technical staff. If multiple days are graphed together, workload highs and lows can be easily identified when displayed in a run chart format as shown in Figure 2.

![Figure 2: Volume by Hour and Day of Week](image)
When reviewing hourly volume, it is important to understand what environmental or man-made factors can impact the data before attempting to match staffing to workload. For example, Figure 2 volume is “time received” which appears to have some fluctuation due to staff break time around 09:00, 12:00, and 18:00.

Once volume is understood, the next step is to add current staffing levels. Figure 3 is an example of first analyzing volumes (by time of receipt in the laboratory) and then adding staffing levels (FTEs) to provide a visual comparison of staffing to workload.

Figure 3: Volume to Staffing Comparison

When comparing multiple daily volumes, it is common to discover fairly predictable volume patterns during the 24-hour period. Figure 3 reflects a typical hospital with an active outreach program. Inpatient volume peaks in the morning and early afternoon, while outreach volume begins to enter the laboratory in the afternoon and evening. A potential response to these results would be to shift staffing away from the middle of the day to the earlier morning and evening hours. However, before changing evening hours, one final analysis is recommended if the laboratory has an active outreach program.

Understanding when couriers drop off specimens is critical. The data analyzed can be either the total number of requisitions or the percentage of a total day’s volume, since both provide insight as to when staff must be available to receive the work. Figure 4 shows an analysis of the percentage of courier requisitions received by hour of the day.

Figure 4: Percentage of Courier Requisitions Received by Hour
In examining courier drop-off times, it is important to review any opportunities to bring specimens in earlier. The couriers are the first domino to fall in the internal testing chain; the earlier the volume comes into the laboratory, the earlier it can be processed, tested, and reported. The ultimate goal of most small- to medium-sized hospital outreach programs is to have the majority of all results out before the evening shift leaves.

One final analysis to determine the appropriate level of staff to handle a specific workload may be desired. The two types of data needed for this analysis are volume and the time it takes to handle the volume. For example, a laboratory acquires a large outreach psychiatric care center and estimates an increase of 150 requisitions a day (volume) to be sent via courier in the late afternoon. From productivity studies, the manager knows it takes an average of three minutes to process a requisition. The following is a calculation of how to determine how much additional staff is needed:

- 150 requisitions (volume) x 3 minutes (productivity time) = 450 minutes.
- 450 minutes / 60 minutes per hour = 7.5 hours (additional time needed to handle increased volume).
- Depending on the arrival time of the volume and the length of time needed to complete processing, the manager may decide to hire two additional part-time processors or one full-timer.

**Matching Staffing Levels to Workload – The Challenge**

Once the volumes and staffing levels by time of day are understood, the final step is to model different staffing scenarios that take into account the various factors mentioned in the beginning of this article. The following are a few questions that need to be asked to challenge the current approach:

- Is our current staff schedule dictated more by staff preference or by workload demands?
- Do we tend to use more full-time employees instead of part-timers that could provide more flexibility?
- Where do we experience the most overtime? Is this a symptom of not matching staff to workload?
- Where do we experience the largest backups? Is this a symptom of not matching staff workload?
- Have our volumes or the time of day the volumes come into the laboratory changed recently, or do we expect a change in the future?
- Is our skill mix appropriate? Do we have technologists doing non-technical work in high volume areas? What is the necessary skill level, and are people cross-training when possible?

Determining optimal staffing levels in response to workload is a combination of science and art due to the many factors that impact staffing that cannot be measured. The laboratory manager’s or supervisor’s challenge is to gather as much statistical information as possible but also apply his or her experience regarding the organization’s needs and expectations. Through benchmarking with peers and conducting detailed reviews of high volume or rapidly expanding service areas, laboratory leaders are better positioned to defend their needs to senior administration and, of most importance, meet the needs of patients and clients.

**References**

2. Chi Solutions Benchmarking Services, Chi Solutions, Inc., [www.chisolutionsinc.com](http://www.chisolutionsinc.com).