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Psychosocial Factors, Workload, and Risk of Medication Errors

Anthony F. Grasha, Ph.D.
Professor of Psychology,
Department of Psychology,
University of Cincinnati,
Cincinnati, OH

The number of scripts filled per hour and other measures of objective workload are seen by some people as a primary cause of misfills. This is such an important concern that identifying the safe number of prescriptions pharmacists can fill has been debated at professional meetings and by boards of pharmacy.[1,2] Unfortunately, when a single explanation becomes the focus of any event, one becomes susceptible to the "illusion of correlation."[3] This term refers to a bias that arises when some factors that may be less important than imagined or possess a more complex relationship to other things are embraced as explanations for an event. The tendency to ignore or discount the role of cofactors or other causes is even more difficult to overcome when there is social support and reinforcement for a single position.

Pharmacists are not immune to such biases. When interviewed about the causes of misfills, responses such as "I was busy," or "I had too much work to do" were typically at the top of the list.[4] Such reports are usually retrospective and submitted on company incident reports or to a board of pharmacy inquiry days and weeks after the incident occurred. Identifying cofactors or other causes is difficult because of how our memory system operates. Contrary to what one may presume, our recollections of events are not instant replays of what really happened. Rather, people reconstruct what occurred. In the process, it is not unusual to filter and exclude information, fill in details, and add things that were not there--often to deflect responsibility or to make oneself look good.[5]

While the case thus far is being made that workload alone is not always the sole culprit behind errors, this does not mean that workload at times is not a problem. Some pharmacists work under conditions of high prescription volume and may have a difficult time coping. The issue is whether or not everyone who works under such conditions will be prone to a higher risk of errors, and whether or not a given workload level will produce the same problem for everyone. To answer these questions, we have to go beyond personal reflections and incidents and find out what is true for a group of people who encounter the same factor in their workplace. Only then can we generalize our theories to apply to the experiences of everyone.

Moving Beyond Simple Explanations

A recently completed research project by the author involving 36 chain pharmacy field sites showed that the effects of workload and other factors on misfills were more complicated than people initially believed. Initial analyses of the project's outcomes showed that measures of objective workload such as the numbers of scripts filled or store volume were *not* the primary cause of misfills.[6-9] Workload was only one of a variety of factors, including psychosocial influences such as mental processes, one's personal characteristics, one's perceptions of the task and work environment, quality of interpersonal relationships on and off the job, supervisor-employee relationships, and even stress created from working on third-party insurance requirements.

Even when objective workload was a predictor of accurate performance, it did not always operate in ways that might be typically assumed. For example, pharmacists were more at risk for mistakes when they were *less* busy or when they encountered a dramatic shift in prescriptions, from relatively high to low levels. Such shifts were particularly a problem for people working in high-volume outlets. However, in spite of multiple and sometimes counterintuitive causes, specific actions can be taken to address such issues.

Overview of the Research Project

To examine the role of psychosocial influences and workload on human error in a pharmacy, the author developed an 18-month research project exploring issues related to accuracy, effectiveness and job satisfaction.[10] Among other things, the project gathered data from 84 pharmacists working in 36 chain pharmacy field sites. In addition, an anonymous 241-item survey was distributed to 700 pharmacists and 300 pharmacy technicians working for the corporations involved in the field sites. The questionnaire contained all of the psychosocial measures used and was identical to the one that field site participants completed during their training session. Thus, the survey provided additional information on the role that workload and psychosocial factors played in the lives of pharmacy personnel. Six studies also were conducted that involved 230 participants working 7-hour shifts in a pharmacy-simulation laboratory. Finally, a review of the pharmacy and psychological literature on factors associated with human error was completed, and outcomes from previous interviews and focus groups with pharmacists were used to supplement the analyses. The objective was to have multiple sources of input on the issues and to be able to cross-check important findings with at least two independent sources of information.

Conceptual Background

The research design used aimed to uncover the role of psychosocial factors and workload on individual performance; however, this design ran counter to how such problems are typically addressed in the pharmacy literature. Typically, the causes of performance issues and the interventions designed to manage them are studied using a systems approach, which emphasizes human engineering principles.[11-13] While this approach has been highly successful, there are two limitations:[14,15] a lack of emphasis on the personal qualities of people (i.e., their attitudes, values, beliefs, needs, emotions, and personality characteristics) and how such things interface with the components of a system. The intent in the psychosocial design is to identify personal qualities that can put some people at risk for making errors. That information is then used to design interventions to help healthcare providers become more effective. Thus, in the project, measures of personal qualities included impulsivity, Type A behavior tendencies, ability to focus on details and to concentrate, proneness to error, susceptibility to stress from family and social life concerns, stress management skills, and physical and mental hardiness. An association has been drawn between these qualities and human errors in other studies on dispensing tasks.[16-19]

The second issue with a traditional systems/ human engineering perspective is that it ignores how elements of systems are integrated into the subjective experiences and thoughts of people. Thus, the role of personal beliefs, feelings, and attitudes about events inside and outside the workplace and how they combine to affect job performance are not emphasized. However, these things affect job performance by becoming a source of tension, mental distraction, and injunctions for how to behave. Other work has shown that 20% to 30% of a person's current job stress can be attributed to issues residing in the family and social lives of people.[20] These stresses cannot be left at the door of a pharmacy or conveniently ignored. Nor can one ignore the extent to which subjective beliefs and feelings guide actions that contribute to error. For example, a discussion of a medication error in an article in *The New York Times Magazine* describes the antecedents to the mishap.[21] However, only at the end of the article, and almost in passing, the nurse involved is quoted as not questioning the order because she was from a culture in which she was taught "not to question authority." Such examples show how events, thoughts, and feelings internalized outside of the immediate healthcare environment influence behaviors within it.

A model of human performance that illustrates how task, environment and psychosocial factors affect performance is described in the **SIDEBAR** and **FIGURE 1**. This Cognitive Systems Model has guided and directed the design and analysis of data from the research project discussed here.[22-24] This model adds to our understanding of human error and complements work using other perspectives. It suggests that a combination of influences affect human error. Thus, the individual effects of variables and how they combine with other factors must be understood.

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Components of the Cognitive Systems Model

The cognitive system has a sensory register, working memory, and long-term memory. These three parts are interdependent and affect accurate and inaccurate performance. Mistakes can occur if any part of the system fails to perform.

Sensory Register
Equivalent to a keyboard or other input device on a computer, one might not capture needed task information because of degraded sensory input. This may be due to poor lighting, noise from equipment, or talking of other coworkers.

Working Memory
Similar to the operating system of a computer, one's working memory may fail because the amount of work exceeds the cognitive resources available for managing it. Thus, pharmacists might take shortcuts to meet time constraints--such as incorrectly assuming that a prescription from a particular physician was similar in all respects to others recently filled. The ability to select or verify correct products may be affected by confusion arising from similar information in look-alike, sound-alike, and spell-alike medications. In addition, the conscious and automatic checks normally made may be less numerous when demands on working memory exceed its ability to handle them.

Long-Term Memory
One's long-term memory functions similar to the hard drive on a computer. Problems arise from several sources. Needed information might not be present due to a lack of experience, training, or proper encoding. Thus, incorrect thoughts and actions are not recognized as such. Furthermore, when people are tense, the ability of the working memory system to retrieve or to reconstruct information from long-term memory could be adversely affected.

Psychosocial Influences on the Cognitive System
The second component of the model examines the interplay of task and environmental elements on performance (e.g., number of orders completed, work pace, illumination, and how these factors combine with a variety of psychosocial factors). In addition to objective aspects of the task and environment, subjective components such as perceived workload, task-induced moods, and perceptions of the adequacy of lighting also are examined. Other psychosocial factors come into play, including personal characteristics of pharmacists, interpersonal relationships on and off the job, organizational dynamics, and extra-organizational factors such as third-party insurance requirements and the policies and procedures of boards of pharmacy. The underlying assumption of the model is that the interplay of such factors can produce tension and stress that adversely affect how the cognitive system will function.

Adverse Effects of Stress and Tension
Stress and tension have four adverse effects on the cognitive system:

1. Tension increases the rate at which information is processed and subsequently the amount of information handled. When processing capacity is exceeded, mistakes become more probable.

2. Ruminations and thoughts about stressful events may distract people when completing a critical component of a task or prevent them from checking their work in a timely manner. Thus, mistakes may go unnoticed.

3. Stress increases levels of stress, leading to various heuristics, biases, and shortcuts to meet task demands. Pharmacists may change work patterns, rhythms, work pace strategies, or rely upon responses that were similar to what was done before, those most frequently used, or thoughts and actions recently employed. Such decisions may promote inaccuracies.

4. Tension may cause the cognitive system to default to modes of responding that emphasize past habits; these may interfere with more recently learned and adaptive ways of managing a task.

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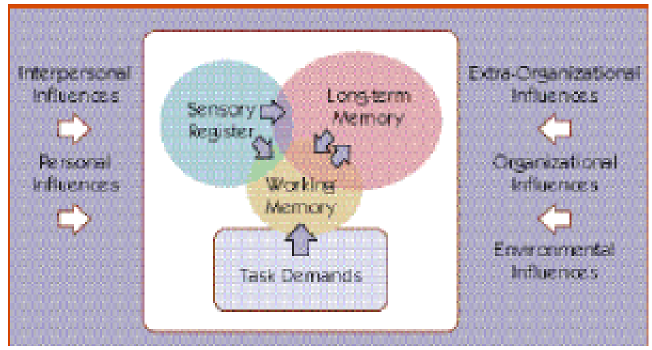
Enhancing Cognitive System Functioning

Increase Sensory Input to Reduce Misfills: Because information processing begins with sensory register, there is a need for clear and unambiguous sensory input. A voluntary and confidential vision and auditory screening was made available to 1,475 pharmacists attending a series of CE sessions on the implications of the model for medication errors. Five percent of the participants had a correctable problem of which they had been unaware. Good vision and hearing is a necessity in a pharmacy, and periodic checkups should be encouraged. Faulty vision or hearing is a source of poor sensory input that the Cognitive Systems model helps to highlight as a potential source of a problem. Currently, however, there are no pharmacy board or company policies mandating such checkups. Auditory input is also important because losses in the high-frequency range are problems for pharmacy personnel. These losses interfere with vowel and consonant discriminations, adding to the confusion among product names that sound alike. Adjustable volume controls on telephone equipment should be standard equipment in any pharmacy to help prevent such confusion.

Figure 1: Components of the Cognitive Systems Model



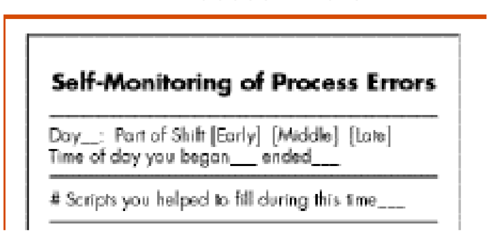
The human information processing system and subsequent performance is influenced by a variety of factors at any given moment.

Objective and subjective levels of pharmacy lighting also need to be taken into account. Research has shown that adequate background light in the range of 146 footcandles reduced dispensing errors from baseline measures of misfills by 32%.[25] The current project also showed how subjective perceptions of light (a psychosocial factor) also affected job performance. Individuals respond to illumination differently, and lighting that may be considered adequate to one person may be perceived as inadequate by another. In the current study, pharmacists rated the adequacy of the illumination in their pharmacies. Compared to those who reported illumination levels as inadequate, pharmacists rating the levels of light as at least adequate were able to find significantly more mistakes in their work (38%) during dispensing. Thus, even the perception that pharmacy lighting was inadequate carries an additional risk for error.

Pharmacists in interviews and focus groups also complained that the light in a pharmacy did not appear to be as good later in a shift. The problem here is that our eyes adapt to background illumination and they fatigue as we continue to work. To counter this problem in the project, adjustable 50-watt high-intensity task lights were placed in six of the pharmacy field sites and pharmacists were instructed to "use them as needed" on difficult-to-read scripts and product labels. Not surprisingly, such lights were used more often during the middle and late parts of a shift and during product verification. When compared to a control group's accuracy without the lights, pharmacists using them "as needed" had a 10.7% reduction in product verification mistakes. A related version that also included a magnification lens along with the light reduced product verification errors by 22% compared to the performance of a control group.

Among the nine prototypes evaluated in the field sites and briefly described in the **SIDEBAR**, the high-intensity task lights as well as the version with the magnification lens attached received the highest overall ratings of effectiveness. They were liked by pharmacists because they helped to identify mistakes, enhance concentration and allowed pharmacists to work more efficiently.[26]

Figure 2: Self-Monitoring of Process Errors



Self-Monitoring of Process Errors

Day__: Part of Shift [Early] [Middle] [Late]
Time of day you began___ ended___

Scripts you helped to fill during this time___

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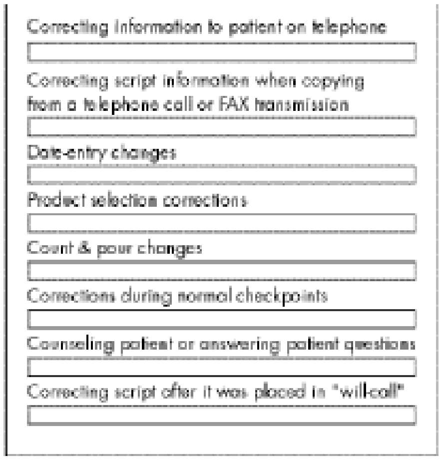
Self-Monitor Your Work: Among the functions of memory during work is monitoring and maintaining awareness of critical components of a task. Many of the lessons we learn on the job about how, when, and where our performance slips comes from monitoring performance. The problem is that monitoring becomes more automatic and one becomes less consciously aware as a task becomes familiar. To counter such tendencies, all pharmacists in the research project periodically monitored their process errors as they worked. Process errors are mistakes that are made and then


Correcting information to patient on telephone

Correcting script information when copying from a telephone call or FAX transmission

Data-entry changes

Product selection corrections

Count & pour changes

Corrections during normal checkpoints

Counseling patient or answering patient questions

Correcting script after it was placed in "will-call"

corrected as a normal part of doing any job. In everyday life, one experiences them while driving a car, typing on a computer, playing a sport, and in almost everything else one does. Process errors are a very sensitive measure of error tendencies. Catching them helps one to improve performance, to learn from one's mistakes, and to identify time periods when one is drifting into an error mode.

Pharmacists recorded their process errors over an 18-hour period covering two of the four weeks of the project. The time was equally divided among the early, middle, and late parts of their shifts. Process errors were recorded in 4 x 6-inch booklets on pages shown in the **SIDEBAR** and **FIGURE 2.** Participants placed a check-mark or slash in the space provided every time they identified a mistake in one or more of the areas covered. During a two-week baseline period, process errors were detected on 7.4% of all prescriptions dispensed. The self-report data were almost identical to the 7.2% of process errors detected by independent observers of pharmacists over an equivalent two-week period in an out-patient pharmacy.[27] There was no correlation between the reports of process errors and a measure of the tendency to give socially desirable responses, which was embedded in the questionnaires. The anonymous and confidential reporting procedure yielded accurate and stable levels of error tendencies.

Most process errors detected occurred during data entry (41%), which is typically where most mistakes occur in other research.[28] In this project, as well as in the out-patient pharmacy experience, the majority of label mistakes were relatively minor. Process errors were detected during "count and pour" (14.4% of the time), at verification checkpoints (14.2%), during product selection (12.5%), when copying from a telephone or FAX (8.6%), providing information in telephone conversations (4.2%), and when reviewing scripts placed in Will-Call (2.2%).

As a rule of thumb, when the number of process errors begins to exceed 6 to 8 per hour, mistakes are more likely to get past normal verification processes. Thus, taking a short break or making a change in the task is advised. Monitoring also might be initiated when the pharmacist is feeling out of sorts, ill, or fatigued. Monitoring would help to focus attention and serve as an indicator of whether such states would likely to lead to additional mistakes.

Why Monitor Process Errors?

Process errors are important to periodically monitor for three reasons:

1. They are immediately available parts of performance that help identify potential problem areas in one's work that need special attention. Pharmacists evaluated the task of recording them as helpful in enhancing concentration, working efficiently, and as providing insights into work habits.

2. Monitoring process errors leads to a reduction in the number of times they occur. Self-monitoring alone was responsible for a 21.7% reduction in mistakes that were missed during final verification.

3. In addition to helping to increase awareness, they also are a good indication of when the cognitive system is moving into an error mode.

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Task Influences on Job Performance

Low Workload and Shifts in Workload May Lead to More Mistakes: There are many ways to define workload. One of several used in the research project was to examine the total number of scripts pharmacists worked on either alone or with help during a shift. The percentage of process errors observed for different numbers of scripts worked on were determined for each pharmacist. The average percentage of process errors to scripts worked on identified for different levels of workload are shown below.

40 to 105 scripts worked on in a shift: 11.2% process errors occurred

106 to 192 scripts worked on in a shift: 7.9% process errors occurred

193 to 327 scripts worked on in a shift: 6.1% process errors occurred

More process errors were made when pharmacists were less busy.

Another way to examine the effects of workload is to see what happens when pharmacists were working on fewer than 15 scripts per hour (relatively low workload) or more than 25 scripts per hour (relatively high workload). This indicates what occurs when a shift in workload occurs in the low-, medium-, and high-volume stores of this project. **FIGURE 3** illustrates how the incidence of process errors changed. In the low- and high-volume stores, On average, for every six process errors detected and corrected, one mistake that was either relatively minor or potentially clinically significant got past normal verification processes. This 6:1 ratio of detected mistakes to those undetected or missed by normal verification processes also was noted among our laboratory pharmacy simulation participants and in the out-patient hospital pharmacy study mentioned earlier.

more mistakes were made when pharmacists worked on 15 or fewer scripts per hour. Fewer mistakes occurred when prescription volume was high. Pharmacists in medium-volume outlets were not affected as much by shifts in their workload.

Shifts from high to low workload conditions were more detrimental for pharmacists working in high-volume stores. They made more process errors when workload dropped than they did while maintaining a faster pace. Such changes in work rhythms from high to low workload in stores in which someone normally expects to work harder may disrupt cognitive processes used to verify one's work performance. When workload increased in the low-volume stores, however, pharmacists had fewer errors. Working at a relatively faster pace seemed to increase task engagement and concentration, which resulted in fewer mistakes. With less work to do, however, boredom may occur and it becomes easier to focus on non-task issues that interfere with performance.[29] Pharmacists in focus groups routinely mentioned that "some of my worst times were when "I did not have enough to do."[30] Pharmacists are recommended to take extra care during lulls in work and to find ways to distribute tasks to avoid dramatic shifts in pace.

Working at a faster pace, however, does increase subjective workload, or job-related tension. In this project, the NASA Task Load Index was used to evaluate overall task tension.[31] It consists of six subscales that evaluate perceptions of physical demand, mental demand, time demand, concerns for performing well, and task-related frustration and effort. A composite index of overall task tension that ranges from 0 to 100 points can be calculated. The outcomes showed that task tension (perceptions of subjective workload) generally increased when the number of scripts dispensed was higher.

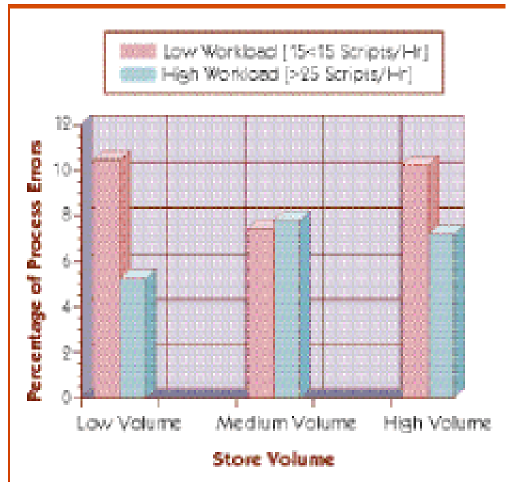
When workload was relatively low (i.e., low-volume store and working on <15 scripts per hour), participants in the project rated their overall perceptions of task tension as 40.2. When working under conditions of relatively high workload (high-volume store and working on >25 scripts per hour), their average overall task tension was rated as 60.5. In both situations, pharmacists reported identical scores on the NASA Task Load Index when rating their motivation to perform well on the job (low-volume store average = 88.3; high-volume store average = 87.5). However, when working under conditions of high workload, they rated themselves as possessing significantly more task tension due to mental demand (74.1 versus 47.5), physical demand (47.2 versus 27.1), effort expended (71.2 versus 46.1), frustration with the task (44.5 versus 12.3), and time demand (47.8 versus 23.4). Corresponding increases in perceptions of task tension also were noted in the low-volume stores when a shift in workload from relatively few scripts (<15 per hour) to a relatively large number (>25 per hour) occurred.

Task tension (subjective workload) changes with increments in objective levels of work. Such increases up to a point seem to be needed to maintain accurate performance. There is likely a point at which some combination of objective and subjective workload can become dysfunctional. That point, however, will vary because people have different thresholds for how much work they can competently accomplish. Furthermore, it is likely that any effects of workload on errors will involve both low as well as high levels of workload. Consequently, one is unlikely to find a magic number associated with how many scripts any one pharmacist can dispense that will apply to everyone.

Personal Influences on Job Performance

Performance Feedback and Setting Goals Increases Error Detection: Pharmacists working in 12 of the field sites were asked after the first two weeks of the project to calculate the percentage of process errors they observed before sending their booklets to the research team. Based on a chart of normative data on the average percentage of process errors that all pharmacists in the study made, they were asked to set a goal for the following two weeks. Their choices were to either maintain current levels of work performance if they were satisfied or, if not satisfied, to try to improve their ability to detect mistakes.

Figure 3: Changing Incidence of Process Errors



Compared to a control group of pharmacists working in 12 stores where no feedback was provided, those who set a goal to maintain their performance increased the number of process errors detected by 22%. On the other hand, those who set a personal goal to improve increased the percentage of process errors detected by 103%. They became more aware of their actions on the job and better able to notice problems. While comparing one's performance to others is useful, establishing personal improvement goals based on monitoring behavior also should have beneficial effects.

Personal Influences on Job Performance

Managing Field-Dependent Cognitive Styles Reduces Error: A version of the Embedded Figures Test was used to assess whether people were field-independent or field-dependent.[32] People are asked to identify a geometric shape that is embedded in one or more other shapes. Those who do so easily are labeled field-independent and are able to focus on details and are not easily distracted. People who experience problems with the task are field-dependent and tend to miss details. They focus on the "big picture" and are easily distracted. The data showed that pharmacists who were field-dependent (i.e., big-picture oriented, less focused on details) identified 20% fewer process errors than their field-independent counterparts.

The following points can help those who are more field-dependent to maintain a better task focus in a pharmacy. Because they help to focus attention, eliminate distractions, and clarify details, these suggestions are likely to be useful to everyone.

Remove any visual or auditory distractions from the workspace or take steps to prevent them from recurring. Other work also has shown that the majority of dispensing errors involve incorrect label information and that errors generally were associated with distractions and interruptions.[33,34] Thus, eliminating snacks, cartoons clipped from newspapers, family pictures, greeting cards, and other items from the immediate visual field used for data-entry, final verification, or count and pour is recommended. While soft music can be soothing, playing relatively loud music or having television sets on in the workspace can be distracting. The same thing can be said about keeping the workspace clean and making sure that equipment, unused medication bottles, and other items not immediately needed are placed where they belong.

Look for ways to mute noise and other distractions associated with pharmacy equipment whenever possible. For various reasons, people sometimes accept their environment as a given and don't take active steps to change it. Thus, the "pseudo-fixed features" of the spaces we inhabit (i.e., those that can be changed) are left alone, with corresponding decrease in satisfaction with our work environment. Sometimes, however, even relatively small changes can make a big difference. In one case, a pharmacist who enjoyed verifying scripts tended to do so next to a laser printer that gave off a lot of heat. The extra heat was distracting and generally uncomfortable but it was not until he did self-monitoring for process errors that he discovered more errors detected and corrected when working near the printer. The printer was moved and the problem was solved.

Some people need to complete a task before being interrupted. Pharmacists should make sure that other pharmacy personnel know this. They can help by not interrupting someone who is in the middle of a task. And, they can tell patients who need to talk with the pharmacist that he or she is finishing a task and will be with them in a moment. When working alone, some pharmacists find that posting a sign for patients that says the following helps: "Thank you for your patience. I will be with you in just a moment. I am currently completing my work on another patient's prescription."

Use copystands or copyholders to hold scripts when entering information into a computer. Some people still place scripts flat on a counter when entering data, in spite of the disadvantages of doing so. Having information directly in front of you at a comfortable visual angle helps you to focus on details. It is not unusual to find pharmacists and pharmacy technicians at least periodically failing to do such things. A version of a copyholder was attached to a computer monitor in the field sites. Pharmacists who used our copystrips reported making 24% fewer process errors during data entry compared to their baseline performance. Similar levels of improvement were noted in our laboratory simulation.

Exaggerated product labels and NDC numbers were designed and placed on a sleeve that fitted on the front stock bottle of 30 products that were targeted for special attention. The sleeve functioned like one on a coffee cup and could be removed when the bottle was empty and placed on the next product bottle. The names of the products were exaggerated by using color fonts and 18 to 36 point type. This helped people to focus on the details of the product when pulling it as well as during final verification. There was an overall 27.8% reduction in process errors when the product sleeves and labels were in place.

Adequacy of Breaks, Impulsivity, and Job Satisfaction on Mistakes: Pharmacists who made the fewest process errors (<4.8% of scripts filled) scored differently on three other personal qualities from those who made the most process errors (>11.6% of scripts filled): They were more satisfied with the quality of their breaks, they had lower impulsivity scores, and they were more satisfied with their jobs. Being less impulsive, they tended not to rush their work and took enough time during product verification to insure that work was completed properly. In terms of job satisfaction, they were more satisfied, relatively speaking, with the level of demand placed upon them, their opportunities for promotion and pay raises, the feedback they received on performance, the rewards they received for effort expended, and the tasks they had to complete. The more satisfied and less impulsive pharmacists also were among the most productive. On average, they worked on 29 scripts per hour versus the 22 scripts worked on per hour by pharmacists who were more impulsive and less satisfied with their jobs.

The major aspects of the workplace that differentiated the most and least satisfied pharmacists were not things typically under their control. Such factors tended to be embedded into the culture of the stores and companies for whom the pharmacists worked. This finding is reminiscent of what happens in other industries: Companies that place a priority on taking care of the needs of their people, showing concern for them, and not taking advantage of employees are among the most productive and profitable.[35] Such organizations are routinely rated as companies for whom everyone wants to work. Employees reward the attention by giving their organizations the discretionary effort that allows them to become leaders within their industries.

Organizational Influences on Job Performance

The Quality of Supervision Affects Accuracy: The pharmacists who made the fewest mistakes and were most satisfied with their jobs also rated the quality of their supervision higher. This was true whether the supervisors were in the stores or were part of a district or regional management team. The pharmacists not only made fewer process errors but found more mistakes when doing random checks of Will-Call items and checks for discrepancies among random samples of computer-generated labels attached to the original prescriptions. Generally these pharmacists had supervisors who allowed them to "do their jobs as they saw fit" and "worked with them" rather than constantly "telling them what to do." Supervisors who made demands for people to meet high performance standards in a more controlling manner (i.e., directing versus working with people, using negative incentives versus encouraging) had employees with higher levels of job dissatisfaction--and who also tended to make more mistakes.

Because supervision at the individual store as well as the broader organizational level was an issue, the checklist in the **SIDEBAR** consists of items that pharmacists indicated their supervisors needed to improve upon. These items generally can be taught. A good book on supervision can be helpful, as is taking a management-training course or CE seminar, or beginning company sponsored work in this area. Supervisors of pharmacists generally have good administrative and technical skills; it is in the human relationship side of things where improvements can be made. Pharmacists should fill out the checklist in the **SIDEBAR** to assess areas in which they might need to develop supervisory skills.

Extra-Organizational Influences on Job Performance

Stress from Third-Party Insurance Requirements: Third-party insurance requirements affected accuracy and were a major source of tension and stress for pharmacists. Indeed, it has been known to be a problem for some time. The outcomes of the research project showed that such tension had important implications for accuracy. The amount of time spent on third-party insurance issues and the paperwork, answering patient questions, and other tasks associated with it were stressful for most people. Compared to pharmacists who reported relatively lower levels of such stress, those who rated third-party insurance issues as relatively more stressful made 40.5% more process errors. Pharmacists reporting high levels of stress from third-party insurance requirements also did not detect as many mistakes when doing additional random checks of Will-Call items or when looking for discrepancies in checks of computer labels attached to their original prescriptions.

This is an issue that needs to be dealt with on a broader level. Pharmacists are captive to policies and procedures associated with insurance providers over which they have little direct control. It is likely going to take an industry-wide initiative to resolve the issue. Pharmacists might also do more to get patients to handle disputes with their insurance companies or to have technicians involved more in handling some of the paperwork and telephone calls when it is appropriate to do so.

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Grasha Pharmacy Supervisor Skills Checklist

The following behaviors from the larger checklist were identified by pharmacists as things that effective supervisors did effectively. How many apply to you?

____ Set clear goals and directions for the work that people do
____ Help to establish a climate for excellence and professionalism
____ Clear but not overbearing when discussing expectations.
____ Encourage people to enhance their level of performance.
____ Delegate appropriately the freedom to do a job.
____ Able to "work with people" rather than "always telling them what to do."
____ Insure that the reasons why something is done are clearly stated.
____ High standards for performing tasks are set.
____ Able to help people set priorities for completing multiple tasks.
____ Promotes critical thinking about how to work effectively.
____ Able to motivate and get people excited about their jobs.
____ Able to get people to identify and solve problems as a group.
____ Provide sufficient answers to questions.
____ Able to fix responsibility for getting tasks accomplished.
____ Hold people accountable for doing their jobs properly.
____ Adjust my supervisory style to accommodate differences among people.
____ Make people feel involved and important.

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Conclusion

It should be clear that a variety of psychosocial factors--such as those associated with cognitive functioning, perceptions of the task and physical environment of the pharmacy, personal qualities of people, organizational dynamics, and extra-organizational factors--play a role in accuracy in the workplace. Objective workload seems to be involved, but not in the way that most people assume. Low levels of workload seem to be more problematic, as are dramatic shifts in workload, particularly in high-volume pharmacies.

All of the factors affecting errors in this article had independent effects on performance. But the reality of life in the pharmacy is that they operate together in a mix of variables that influence performance. Statistical analyses allowed for a determination of what the top six contributors to inaccuracy were. In order, they were: perceptions of inadequate supervision, low workload, perceptions that breaks were inadequate, field-dependence (i.e., big-picture orientation), low levels of task tension, and perceptions that pharmacy lighting was inadequate.

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