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# The Impact of Interruptions and Distractions on Hospital Pharmacies: A Review with Recommendations

**T**he impact of interruptions and distractions (I&Ds) on efficiency and safety is well documented across multiple industries. Within healthcare, studies about the impact of I&Ds have focused primarily on medical and nursing practice. To date there has been limited attention devoted to the impact of I&Ds on pharmacy flow and safety, which presents a significant opportunity to make a difference.

In this article, we summarize three studies and find their conclusions are similar to those found in other industries and medical practice areas: interruptions disrupt flow and reduce safety.

Raimbault et al. (2013) conducted an observational study in a 500-bed teaching hospital and found that pharmacists experienced an average of nearly 15 I&Ds per hour. Technicians experienced slightly more than 10 I&Ds per hour, equating to one every 4 minutes for pharmacists and one every 6 minutes for technicians.

Flynn et al. (1999) studied pharmacist and technician I&Ds in a 451-bed hospital’s ambulatory care pharmacy. The study showed about 6 interruptions per hour and about 7.5 distractions per hour per pharmacist or technician. The authors defined an interruption as the cessation of productive activity before the current prescription-filling task was completed. The authors defined a distraction as a stimulus from a source external to the pharmacist that was not followed by cessation of activity, but by the pharmacist continuing productive efforts while responding in a manner that was observable.

Silver (2010) observed hospital pharmacists’ activities in a 274-bed hospital. During the study period, Silver recorded 528 I&Ds over a period of 1,094 minutes—approximately 1 every 2 minutes! Silver created a taxonomy, which is presented in the table below.

Although the frequency varies from hospital to hospital, from setting to setting, the conclusion is undeniable: pharmacy personnel are immersed in an environment in which they have to perform important and delicate work, filled with nuances and minor distinctions, while inundated with constant interruptions and distractions. Additionally, the interruptions and distractions are often not just “one degree-of-separation” from the original task. Pharmacists and technicians find themselves two-or-more

degrees from the original task (i.e., interrupted during an interruption), constantly struggling to return to the original task.

We strive to insulate physicians from I&Ds to ensure safe prescribing and to insulate nurses to ensure safe administration, but we won’t close the loop unless we insulate pharmacy personnel from I&Ds to ensure safe medication order review, preparation, and delivery.

Pharmacists, nurses, and administrators, walk into your pharmacy and observe for an hour. If your pharmacy is typical, you will observe I&Ds constantly. If your pharmacy is typical, the pharmacists and technicians will handle them calmly and assertively because, under the circumstances, it is the best thing to do. But it is not the safest thing to do.

## Linking I&Ds to Medication Errors in the Pharmacy

The literature points to scientific and anecdotal evidence that I&Ds contribute to errors in the pharmacy. For example:

- The study by Flynn et al. (1999) measured a total error rate of 3.23%, however, the error rate for sets of prescriptions with one or more interruptions or one or more distractions was 6.65% and 6.55%, respectively.
- Beso et al. (2005) conducted a study in a 450-bed NHS-system teaching hospital in London. The study identified I&Ds as the second most common source of error—second only to excessive workload.
- In a study conducted by the Massachusetts Department of Health and Human Services (n.d.), 62% of the pharmacists surveyed pinpointed “too many phone calls” as the number one reason for medication errors.
- Peterson et al. (1999) conducted an anonymous mail survey. The pharmacy respondents cited I&Ds as the fourth highest ranking factor related to medication errors behind high prescription volumes, overwork, and fatigue.

## Types of I&Ds in the Pharmacy

The dominant I&D type affecting pharmacy is the phone call. Other I&Ds include arrival of healthcare professionals at the pharmacy and intra-pharmacy (interpersonal) I&Ds of a professional or personal nature.

One study, conducted at the Community Medical Center in Missoula, Montana (Sobek & Jimmerson, 2003), was designed to “apply the principles of the Toyota Production System to hospital pharmacy.” The authors stated the following as one of the study’s insights: “pharmacists and technicians were constantly interrupted and distracted.” They recorded that many of the interruptions were phone calls from nurses desiring to “check on, clarify, change, or ask for more instructions on a medication order.” Their research showed that pharmacists fielded as many as 10 calls per hour.

Julie Silver (2010) reflects a similar finding. “The prominent interruption in the pharmacy is phone calls.” She also astutely observes that although the subject of the primary interruption is the person who answers the call, the ring itself distracts everyone. In most pharmacies, a person is not designated to answer the phone. The phone rings several times until someone “submits.” This post-ring scenario creates a dis-

**Table I: Interruptions, Frequency, and Duration**

Type of Interruption	Frequency (count)	Duration (sec)
Clarifying Medications	118	100
Transfer Calls	64	25
Missing Medication*	49	94
Confirm Orders	114	27
Check Up Orders*	49	59
Change Medication	14	85
Personal	6	75
Hurry up Calls*	24	43

\*Tasks related to medication tracking & delivery (Silver, 2010)

## SUMMARY

traction in and of itself. Some pharmacies have routed calls to one phone or designated one person as responsible.

It is not unusual for pharmacy practitioners to multi-task during an interruption, especially during a phone call. Pharmacists frequently continue to enter or verify orders while handling the call. Technicians frequently continue to prepare doses while handling the phone call. Pharmacists and technicians multi-task to maintain the flow and negate the effect of the phone call on their ability to get the work-at-hand done in a timely manner. But their well-intended efforts create unsafe situations.

### Missing Medications: A Primary Instigator of I&Ds

Missing doses have become the Achilles heel of the medication use process. In many cases, the doses are prepared and dispensed, but when nurses search for the doses, they are nowhere to be found. Unable to locate the dose, the nurse has no choice but to contact the pharmacy. And the nurse often calls.

The study conducted at the Community Medical Center in Missoula, Montana (Sobek & Jimmerson, 2003), recorded that 25% of all phone calls were related to missing medications. While Silver's study (2010) showed that 12% of I&Ds were directly attributed to missing doses inquiries.

### Advancing Clinical Practice

As patient therapy becomes more dependent on medication management, the pharmacist will play a hands-on role. The economic impact of clinical pharmacy services (CPS) is clear; yet offering such services requires pharmacists to redirect their time, and that requires changes in hospital pharmacy operations. Perez et al. (2008) found, on average, for every \$1 invested in CPS, \$4.81 was achieved in reduced costs or other economic benefits. By investing and finding ways to eliminate I&Ds, pharmacists can reinvest this time to multiply their benefit to the organization and to patient safety.

### Call to Action

Most hospitals have pharmacy information systems, clinical decision support systems, computerized prescriber order entry, and barcode point-of-care medication administration. Most hospitals have automated dispensing cabinets or dispensing robots or both. Most hospitals have medication safety officers, medication safety committees, and clinical pharmacy specialists.

Most hospitals have decreased the number of miscalculated doses, the number of overdoses and underdoses, the number of omitted doses and drug interactions. Most have tackled sound-alike, look-alike errors and are vigilantly handling the drug shortage crisis. But most have not tackled the web of human behavior and faulty systems that produce I&Ds, especially phone calls, and the resulting errors.

A multi-pronged approach to the problem is needed. First, pharmacies should strive to eliminate I&Ds altogether. Tackling the root cause is preferred in any process improvement initiative, and missing medications are a key source of waste and error. Second, for the remaining I&Ds and missing medications, the pharmacy should improve processes for handling inquiries. This should include reducing the cycle time needed to resolve each inquiry and establishing rotating resources dedicated to the inquiries and separated from the staff working on new medication orders.

A distinct effort to reduce I&Ds in the pharmacy will not only reduce errors, it will also improve efficiency and enhance job satisfaction for all.

- Pharmacy personnel are not immune to the I&Ds that plague their physician and nurse colleagues.
- If we can reduce missing doses, we can reduce telephone calls.
- If we can reduce telephone calls, we can reduce I&Ds.
- If we can reduce I&Ds, we can reduce errors.
- Multidisciplinary collaboration and process change is needed to reduce I&Ds related to missing doses.
- Software technology is now available to reduce the number of missing doses through real-time tracking, which reduces telephone calls, which reduces the number of I&Ds, which reduces the potential for error.
- Reduce the impact of I&Ds by reducing cycle time to resolve and isolating the distractions away from personnel working on new orders.

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