I've been thinking...

January 2015—2014 ASHP MidYear Meeting Technology Wrap-Up

I've been thinking about my twenty-first American Society of Health-System Pharmacists' (ASHP) Midyear Clinical Meeting and Exhibition in Anaheim, December 8-9.

My first ASHP was Miami in 1995—the same year the society announced that the "h" in its abbreviated name would henceforth stand for Health-System rather than *Hospital* as documented on its birth certificate.

Recognizing that its core membership was still comprised mostly of pharmacists practicing in hospital settings, ASHP stated, "The new name reflects changes occurring in the hospital industry, including consolidation of facilities and diversification beyond inpatient care into ambulatory care and homecare."

When I started this journey, only a handful of modest exhibits showcased technology. The behemoths in the hall were the drug-company exhibits manned by large staffs talking to each other when they were not handing out tchotchkes—the most popular of which that year were beanie babies.

Over the decades, drug companies have steadily reduced their footprints, staffs, and giveaways, while pharmacy-automation exhibits have steadily claimed more floor space with larger staffs to accommodate the masses eager to see technology demonstrations. The biggest single category of ASHP's 2014 exhibit-hall space was clearly devoted to pharmacy automation.

In addition to bigger-than-ever technology booths, ASHP inaugurated the Intelligent Pharmacy Pavilion, 7,200-square feet intended to simulate hospital settings (e.g., pharmacies, clean rooms, patient care areas, etc.). Attendees were provided with audio headsets for self-guided tours that featured technologies from companies that had the budgets and the interest to participate. Whatever its value, the pavilion did not come close to featuring all of the pharmacy technology options in the hall, nor did it feature the latest options.

In any instance, one wonders how long before ASHP changes the name of its December meeting to the Midyear Clinical *and Technology* Meeting!

A number of new products and technologies arrested my attention in ASHP's extravaganza next door to Disneyland:

Bar-coded Closed-System Transfer Device

Impressing me the most was a bar-code enabled closed-system transfer device (CSTD) from BD, sort of hidden at a substation within their large exhibit. BD IntelliPort Medication Management System yet to clear clinical trials required for FDA medical-device approval, involves several devices: one for preparing/labeling anesthesia syringes, an automated-delivery system for measuring bolus injections during surgeries, all interfaced to software on an iPad.

The syringe-preparation/labeling system directs pharmacy technicians or anesthesiologists to scan drug vials, which in turn programs a patented printer that not only produces matching drug labels for application to syringe barrels but also prints and applies bar codes on syringe luer tips, which also map to the drugs that were drawn into the syringes.

The medication-delivery system is comprised of Bluetooth-enabled delivery ports attached to IV lines. When the bar-coded syringe tips are placed into delivery ports, built-in readers cause their drug names and concentrations to appear visually on tablet screens while audibly announcing the same.

Furthermore, BDs automated ports measure the flow of bolus injections, displaying and documenting drug doses administered. This technology has great promise for reducing syringe swaps and eliminating missing documentation. I want my anesthesiologist to use this system for my next operation.

Automated Dispensing Cabinet

Another device that impressed me at this meeting was essentially a reengineering the automated dispensing cabinet (ADC)—the most popular piece of pharmacy automation demonstrated at my first ASHP expedition. Before I tell you about this new ADC, indulge me for a bit of history.

In the early 90s, investment analysts were calling ADCs (think Pyxis) "ATMs for drugs." At that time, in my inaugural Neuenschwander report, *A Review and Assessment of Automated Dispensing Technologies (1994)*, I noted how they were but mostly were not like ATMs.

In addition to looking a bit like cash machines, after signing on via keypads with user names and passwords, nurses selected patients (accounts) and proceeded to dispense (withdraw) or return (deposit) drugs. However, when drawers containing requested drugs opened, users were looking at something more like cash drawers from which they selected and removed drugs required from numerous options. Matrix drawers offered up to 24 compartments with multiple doses of drugs in each. More restrictive drawers were available that granted access to one pocket at a time, which also contained multiple doses of the same drug. Imagine requesting forty dollars from an ATM and having a

drawer full of twenty-dollar bills appear from which users were to take two and leave the rest. ATMs—not.

Today, majority of ADC drawers granted users access to multiple doses of single drugs. Most vendors also offer single-item dispensing functionality for higher risk and controlled substances.

While Pyxis was the gorilla in the hall at the 1994 meeting, two fledgling companies demonstrated ADCs with 100-percent single-item dispensing—true ATMs for drugs, if you please. The first, Meditrol, was developed by a community pharmacist from Rapid City, Iowa, and was fully operational in two hospitals, one of which I visited that same year in Buffalo, New York.

The second was a prototype being developed by Owen Healthcare, named after Argus Panoptes, the one-hundred-eyed giant in Greek mythology. It was well named, as Argus could stock multiple doses of *one hundred* different drugs and towered over six feet tall while occupying the footprint of four Pyxis Medstations. Furthermore, the giant turned out to be a myth. Within a year, maybe two, Owen acquired Meditrol and slew Argus before it ever lumbered into a hospital. Soon thereafter, Cardinal Health (then owner of Pyxis) acquired Owen and Meditrol, utilized Argus IP, and converted customers into Pyxites. RIP Meditrol.

There was a new ADC on the block at the Anaheim meeting—Narcomedic, who came in from Trois-Rivieres in Quebec, Canada. Before dispensing single items (pills, syringes, ampoules, etc.), this ADC over-packages and labels each with patients' names and bar codes to scan for verification at points of administration. At last, if late, an ATM (and then some) for narcotics.

Technology-Assisted Sterile Compounding Systems

In the Intelligent Pharmacy Pavilion's printed program, what appeared to be a pay-to-play article, written by one of the participating vendors, summoned pharmacists to head west, as it were, toward IV-preparation technology, calling it "the last frontier of pharmacy automation."

Early technology-assisted sterile compounding systems were slow to take root when they were planted seven or eight years ago. However, at this Midyear Meeting, most of the dozen systems available today were on display and were visited by attendees interested in harvesting their benefits.

Just before the meeting, Jerry Fahrni and I published an in-depth report on these systems entitled, *IN THE CLEAN ROOM: A review of technology-assisted sterile compounding systems available in the US.* Click on the link above for a table of contents listing today's clean-room technology options, most of which were demonstrated at the December meeting.

In brief, compounded-sterile product (CSP) technologies range from semi-automated manual systems to highly robotic automated systems. Both begin with computerized work-flow management software and include bar-code scanning to verify drugs, containers, and diluents.

Most of these systems also include scales-assisted gravimetrics and/or camera-assisted volumetrics at critical points in the preparation process for pharmacists to use when verifying completed products from outside their clean rooms. Until recently, venders tended to lean on one or the other. This year's meeting demonstrated a trend—CSP systems are migrating to include both gravimetrics and volumetrics.

Given that ninety-three or ninety-four percent of the nation's hospitals have yet to adopt clean-room technology, I agree that this is a frontier—a critical frontier at that. For a good earful on the subject, read ISMP's January 15, 2014 Medication Safety Alert "Technology and error-prevention strategies: Why are we still overlooking the IV room?" Amen, and amen.

However, I do not believe IV preparation is the "last frontier."

Ambulatory Pharmacy Services

Just as ASHP expanded its territory two decades ago with the name change from *Hospital* to *Health-Systems Pharmacists*, deeper migration "beyond inpatient care into ambulatory care and homecare" was witnessed this year with technologies from bottle-filling machines to blister-packaging systems for LTC and, for the most uninhabited space of all, to systems designed to produce compliance packaging for outpatients. Companies exhibiting these technologies included but were not limited to ScriptPro, Parata, Innovation, TCGRx, Asteres, and Omnicell.

Talk about frontiers, outpatient compliance looms as large as the West during the days of Manifest Destiny.

RFID, Finally

The final technology I want to mention from the Midyear Meeting involves tomorrowland's world of RFID.

Over the years, I've been asked why RFID hasn't been applied to drug packaging for point-of-care verification scanning. First, I doubt if RFID chips will ever displace barcodes on drug packages any more than on cereal boxes in grocery stores. Rather, RFID will augment printed codes on a select number of items, a few of which I mention in a moment.

A universal shift from bar codes to chips seems as likely to me as the US converting to the metric system. The US has converted to metric selectively: grams/ kilograms and liters/milliliters in pharmacy, for example. But miles,

feet and inches, pints, quarts, and gallons, as well as ounces, pounds, and tons are going to be with us for a long time.

However, ASHP attendees met evidence in this year's exhibit hall that after two decades of talk, RFID is finally beginning to walk. More than a mirage on the frontier, RFID has finally materialized beyond prototypes to products that are live in hospitals today.

Vendors demonstrated RFID technology for tracking bullets through pneumatic tube labyrinths, for labeling and tracking products in anesthesia and crash kits, and for managing expensive refrigerated drug inventory.

In the past, RFID companies were thinking at a universal rather than a macro level. For example, MEPS, the granddaddy of RFID companies in the exhibit hall, had been perennially on the verge of releasing an RFID-driven ADC to compete with CareFusion, Omnicell, and McKesson's dispensing cabinets. However, for this paradigm to succeed would require all medications being RFID tagged down to the pill. Not going to happen.

This year, MEPS Real Time's newest Intelliguard revealed a clear shift from focus from macro to micro RFID solutions. The company now focuses on what they call "critical inventory" used by hospitals—high-cost medications in refrigerators and high-risk drugs in anesthesia kits and trays.

KitCheck, a more recent entry, has succeeded out of the gate by applying RFID tags to, well, as its name implies, anesthesia kits, already operational in over 100 hospitals.

MEPS and KitCheck were among the busiest booths at the meeting.

Aethon got plenty of attention as well, showing not only how its MedEx tracking software links with TUGs, which robotically transport items throughout hospitals but also how it can tag and track bullets throughout hospitals' pneumatic transport tubes with RFID.

Regardless of what ASHP calls their Midyear Clinical Meeting, the exhibit hall is more and more about technology. Expect the footprint and interest to grow.

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