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Green Cash Flow Offer

Q: How does the $100 upgrade credit work?

A: For every new TAT-5000 thermometer purchased, Exergen will credit the hospital $100 each for every hospital grade ear or electronic thermometer taken out of service and sent to Exergen.

Q: Can I purchase through a distributor and still qualify for the $100 upgrade credit?

A: **Yes.** If the TAT-5000's are purchased through an authorized Exergen distributor, proof of purchase needs to be sent to Exergen to qualify for the $100 upgrade credit (or direct payment) to the hospital.

Q: What thermometers will be accepted for the $100 trade in credit?

A: Any hospital grade ear or oral/rectal electronic thermometer that is in currently in use at the hospital.

Q: What does a 1 year payback mean?

A: Since ear and electronic thermometers have operating costs of $300 or more per year per thermometer, and a TAT-5000 with the $100 upgrade credit will cost much less than $300 to purchase, payback on the Exergen purchase will be well under 1 year.

Q: What does the 100% reduction in waste mean?

A: Studies show that each staffed bed produces more than 30 pounds of waste per day. Included in that total are thermometer probe covers, broken probes/cables, and discarded thermometers.

Exergen requires zero disposables. If the TAT-5000's are returned for replacements, the returned units are recycled into refurbished units. The refurbished units are also covered by the Lifetime Warranty. The hospital has zero costs and zero waste after purchasing the Exergen TAT-5000.

Q: What does 100% reduction in operating costs mean?

A: Ear and electronic thermometers have annual operating costs to use, including probe covers necessary for each use, probe replacements from breakage, repair charges from limited warranties, user abuse, and significant biomed costs for in house service. This can run about $300 per year or more per thermometer in use.

Exergen TAT-5000 thermometers have zero operating costs. Disposables are optional and can be reused on the same patient. Under the Lifetime Warranty, Exergen will repair or replace at no charge.

Q: How often are the optional disposable probe caps used?

A: On average, the optional disposable covers are used on about 5% of temperatures taken. This is a negligible cost and waste compared to ear and electronic thermometers.

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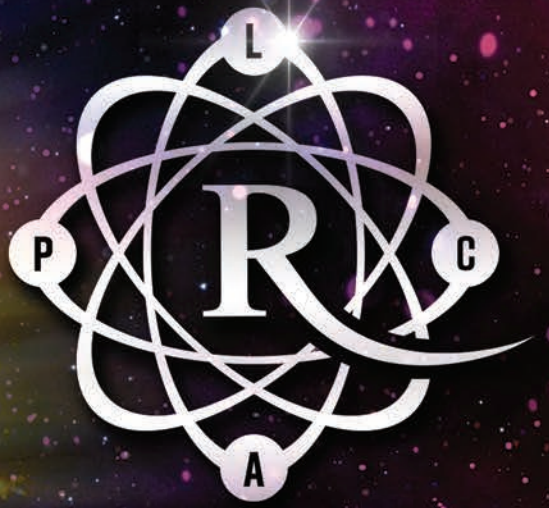

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GETINGE

DELIBERATE

Playing blunderball

First, the massive Evergreen cargo ship Ever Given ran aground, blocking the Suez Canal and raising hackles about the disastrous effects on the global supply chain – especially during the pandemic.

A month later, Egyptian authorities impounded the ship, demanding some $900 million in restitution for the imbroglio and for removing the seafaring clot.

What's noteworthy? Heavy-laden Ever Given still hadn't left the Suez Canal.

The popular comic strip "Family Circus" includes a ghostly character named "Not Me" who is blamed by the kids for just about anything. You know the drill. "Who broke that vase?" Mom asks. "Not me," the kids reply.

We have our own emotional excuse on which to fall for our lack of foresight, planning and preparation. This character's name? "Like Nothing We Have Seen." This convenient crutch simply justifies all our initial shock, myopia and resolute apathy against preparing as many contingencies as possible, no matter how seemingly outlandish or unrealistic.

Here are some contextually relevant and paraphrased examples from actual news reports during the last year or so. Simply read each statement below, and then after the "to-be" verbs "is/was" or "are/were" you insert the trite excuse, "Like Nothing We have Seen." Follow the pattern.

"The COVID-19 virus/pandemic is … [insert trite phrase here]."

"The violent protests at the Capitol were …"

"The recent snowstorm in Texas was …"

"The demand on the power grid in Texas was …"

"The amount of absentee and mail-in voting ballots in the November 2020 election was …"

"The protests – both peaceful and violent – about police brutality were …"

"The instances of police brutality were …"

"The line at/waiting list for the mass vaccination center was …"

You get the idea.

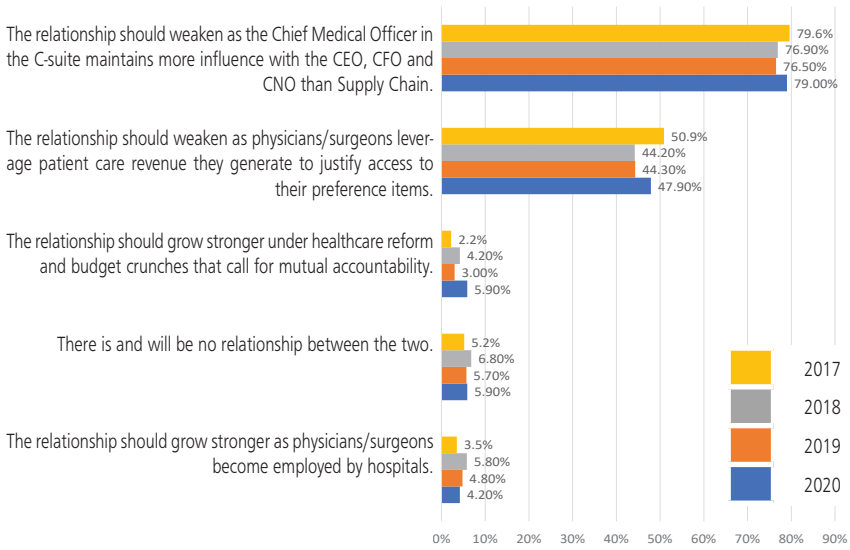
Maybe it's high time we open our eyes and prepare for as many of those situations "like nothing we have seen?"

We're quick to accept and enjoy the "fictional" Hollywood characters and plots in reel life, so why does what's happening in real life seem so unbelievable that we regularly are caught by surprise?

If the last year or two taught us anything, it is that we fail to prepare at our own peril.

DATA BANK

Where do you see the physician's/surgeon's professional relationship with Supply Chain heading long-term?



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FAST STATS

Births and deliveries in the U.S.

3,605,201

provisional number of births occurred in the United States in 2020, down 4% from the number in 2019 (3,747,540).

6TH

consecutive year was a decline in the number of births after an increase in 2014, down an average of 2% per year, and the lowest number of births since 1979.

3%

for Hispanic women, 4% for non-Hispanic white and non-Hispanic black women, 6% for non-Hispanic AIAN women, and 8% for non-Hispanic Asian women was the decline in the provisional numbers of births from 2019 to 2020.

9%

to 7% was the decline for the rates for teenagers aged 15 to 17 and 18 to 19 per year, respectively, from 2007 to 2020.

6%

was the decline in the number of births to women in their early 20s from 2019 to 2020.

5%

was the decline in the number of births to women in their late 20s from 2019 to 2020.

31.8%

from 31.7% was the increase in the overall cesarean delivery rate in 2020 from 2019; despite this increase, the rate had generally declined from 2009 (32.9%) to 2019.

10.09%

from 10.23% was the decline in the preterm birth rate in 2020 from 2019, the first decline in this rate since 2014.

Citation: Hamilton BE, Martin JA, Osterman MJK. Births: Provisional data for 2020. Vital Statistics Rapid Release; no 12. Hyattsville, MD: National Center for Health Statistics. May 2021. DOI: https://doi.org/10.15620/cdc:104993, https://www.cdc.gov/nchs/data/vsrr/vsrr012-508.pdf

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NEWSWIRE

2% of COVID-19–positive individuals carry 90% of virus

The Proceedings of the National Academy of Sciences of the United States of American issued a research article, in which it analyzed data from a saliva-based COVID-19 screening deployed on the University of Colorado Boulder campus. In the dataset, all SARS-CoV-2–positive individuals reported no symptoms at the time of saliva collection, and therefore were infected but asymptomatic or presymptomatic.

The researchers analyzed data from the fall 2020 pandemic response efforts at the University of Colorado Boulder, where more than 72,500 saliva samples were tested for SARS-CoV-2 using qRT-PCR. All samples were collected from individuals who reported no symptoms associated with COVID-19 on the day of collection. From these, 1,405 positive cases were identified. The distribution of viral loads within these asymptomatic individuals was indistinguishable from what has been previously observed in symptomatic individuals.

Regardless of symptomatic status, 50% of individuals who test positive for SARS-CoV-2 seem to be in noninfectious phases of the disease, based on having low viral loads in a range from which live virus has rarely been isolated. Researchers found that, at any given time, just 2% of individuals carry 90% of the virions circulating within communities, serving as viral "supercarriers" and possibly also superspreaders.

One key reason for this is that both presymptomatic and asymptomatic infected individuals can transmit the virus to others. Further, it is becoming clear that certain individuals play a key role in seeding superspreading events.

Cell phones, watches may affect medical implants

Some consumer electronic devices, such as certain cell phones and smart watches, include high field strength magnets. Recent studies have shown that consumer electronic devices with high field strength magnets may cause certain implanted medical devices to switch to "magnet mode" and suspend normal operations until the magnet is moved away from the medical device.

Many implanted medical devices are designed with a "magnet mode" to allow for safe operation during certain medical procedures such as undergoing an MRI scan. These safety features are typically engaged by physicians with the use of a high field strength magnet that is placed near the implanted device placing it into a "magnet mode." Removal of the magnetic field causes the device to return to normal operation.

The Food and Drug Administration (FDA) recommends patients keep any electronic devices that may create magnetic interference, including cell phones and smart watches, at least six inches away from implanted medical devices, in particular cardiac defibrillators. Many implanted medical devices have FDA-approved information written for patients (patient labeling), which cautions patients to keep all cell phones and smart watches at least six inches from the implanted medical device.

People with implanted medical devices may want to take some simple precautions, including:

- Do not carry consumer electronics in a pocket over the medical device.
- Check your device using your home monitoring system, if you have one.

When near high strength magnets, devices with a magnetic safe mode could stop working or change how the device works. For example, a cardiac defibrillator may be unable to detect tachycardia events. Or it may change the operational mode of the devices, such as turning on asynchronous (i.e., two or more events not happening at the same time) mode in a pacemaker.

Medline invests $1.5 billion to reinforce its supply chain

Medline reported the results of a three-year national capital expenditure campaign to support the long-term needs of healthcare providers that included $1.5 billion in new distribution centers, manufacturing capabilities and information technology (IT) upgrades for an improved ecommerce experience.

The Medline Healthcare Resilience Initiative (HRI) spanned dozens of Medline divisions over the course of 2018 to 2020, culminating in approximately 8,500 new jobs, eight new distribution centers, nearly 150 manufacturing expansion projects and a new global digital customer ordering platform.

During the next four years, the company plans to add more than 10 million square feet in warehouse space. With seven of the medical-grade distribution centers strategically set to open this year in key markets, the company is on track to be a leading healthcare partner in the new construction landscape in the United States,

Page 8 ▶

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The new location in Grayslake, IL is estimated to be the largest medical-grade distribution center in the world. Other distribution centers on track to complete in 2021 are: Hammond, LA, Mebane, NC, Montgomery, NY, Richmond Hill, GA, Southaven, MI, and St. Peters, MO.

By continuing to further control the delivery to customers with Goods-to-Person technologies and expanding its private fleet to more than 1,200 MedTrans trucks, Medline enabled:

- Better overall building utilization
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Over the past three years, Medline has also expanded manufacturing capabilities across North America. Most recently, Medline expanded its manufacturing facility in Lithia Springs, GA as part of its North American Manufacturing Expansion (NAME) initiative to produce face masks with a mix of foreign and domestic materials, its first time manufacturing them in the U.S. In 2021, the company plans to install a second line and ultimately anticipates producing more than 36 million face masks per month.

Medline is also focusing on investing in renewable energy to offset its carbon footprint in communities across the country.

Infection risks related to glucose monitoring, insulin administration

Several warning alerts have been issued by the Centers for Disease Control and Prevention (CDC) regarding unsafe practices by healthcare staff conducting or assisting individuals with blood glucose monitoring and insulin administration. These safety issues place those staff members at risk for transmission of bloodborne viruses, such as hepatitis B and C or HIV.

The Joint Commission has found that there are knowledge gaps among providers and/or organizational leaders that have resulted in unsafe practices and subsequent escalation to an Immediate Threat to Health or Safety.

In "Focusing on Infection Control Risks: Glucose Monitoring and Insulin Administration," Sylvia Garcia-Houchins, RN, MBA, CIC, Director, Infection Prevention and Control, The Joint Commission, examines some of the more common mistakes witnessed by The Joint Commission when staff perform glucose monitoring using shared blood glucose devices, insulin pens and other medication cartridges, which create a risk of spreading bloodborne viruses.

The Joint Commission has several standards that relate to this issue:

- Human Resources (HR) Standard HR.01.05.03: Staff participate in ongoing education and training.
- Element of Performance (EP) 1: Staff participate in ongoing education and training to maintain or increase their competency and, as needed, when staff responsibilities change. Staff participation is documented.
- HR.01.06.01: Staff are competent to perform their responsibilities.
- EP 5: Staff competence is initially assessed and documented as part of orientation.
- Infection Prevention and Control (IC) Standard IC.02.01.01: The hospital implements its infection prevention and control plan.
- EP 2: The hospital uses standard precautions, including the use of personal protective equipment, to reduce the risk of infection.
- IC.02.02.01: The hospital reduces the risk of infections associated with medical equipment, devices and supplies.
- EP 1: The hospital implements infection prevention and control activities when doing the following: Cleaning and performing low-level disinfection of medical equipment, devices and supplies.
- Leadership (LD) Standard LD.04.01.07: The hospital has policies and procedures that guide and support patient care, treatment and services.
- EP 1: Leaders review, approve, and manage the implementation of policies and procedures that guide and support patient care, treatment, and services.
- Waived Testing (WT) Standard WT.03.01.01: Staff and licensed independent practitioners performing waived tests are competent.
- EP 4: Staff and licensed independent practitioners who perform waived testing that requires the use of an instrument have been trained on its use and maintenance. The training on the use and maintenance of an instrument for waived testing is documented. HPN

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SPECIAL FOCUS

COVID-19 vaccine shots setting, bending bar on data standards

COVID-19 dose administration illuminates need for tracking, tracing accuracy

by Rick Dana Barlow

Photo credit: Lubo Ivanko | stock.adobe.com

This wasn't supposed to happen.

At least it wasn't designed to happen this way. Or maybe more design was needed.

But it did happen.

Back in late April at a southwest suburban Chicago mass vaccination center (MVC), healthcare workers administered the wrong branded vaccine to eight persons receiving their second shots. They received one brand for their first shot and the other brand for their second shot.

As healthcare experts tiptoed around the possibility of some type of adverse reactions, none was recorded – or at least reported to the media.

However, the incidents amplify a salient question: If the vaccine dosage bottles sported the proper bar codes or passive radio frequency identification (RFID) tags on the packaging, and the healthcare workers properly scanned the labels to match with a patient's vaccination record kept by administrators in the county or state health department, how would this have happened? Further, how might the adoption and implementation of product data standards have affected the process and situation to follow?

Reporter Rebecca Robbins highlights another issue as she wrote in *The New York Times* in late April that "millions of Americans are not getting the second doses of their COVID-19 vaccines, and their ranks are growing." She cites data received from the Centers for Disease Control and Prevention (CDC) that "more than five million people, or nearly 8% of those who got a first shot of the Pfizer or Moderna vaccines, have missed their second doses."

One of the only ways for the CDC to know that is if the federal agency tracks usage data provided by state and county health departments.

The same process used to track and trace the authenticity and production of drugs and devices for recalls and usage also can be used to track and trace patients as recipients, thereby closing the loop.

"Because of the reliance on experienced manufacturers and on established distribution partners, there are systems in place to label and track shipments as well as record what products and lots are included," acknowledged Keith Lohkamp, Senior Director, Industry Strategy, Workday. "This facilitates the exchange of information electronically so shipments and individual lots can be tracked to their destination."

POU needs 4-1-1

Questions linger as to what happens once the individual lots are used at their destination or the point of use.

"Most pharmaceutical products, including vaccines, are labeled with bar codes containing standardized data that includes GS1 Global Trade Item Numbers (GTINs) with the U.S. FDA National Drug Code (NDC) for unique product identification, as well as expiration dates, serial numbers and lot numbers," said Angela Fernandez, Vice President Community Engagement, GS1 US. "Using global data standards, such as GS1, allows all stakeholders to communicate effectively about products' movement through the supply chain from manufacturer all the way to the patient.

Angela Fernandez

"Standards enable robust track and trace processes, accurate inventory management and so much more – all critical factors for safe, effective and efficient distribution," Fernandez continued. "Sharing standardized data between suppliers, wholesale distributors and dispensers makes it possible for all to understand what products are on order and where they are located – in shipping process or already onsite. This visibility helps ensure that clinicians can access them when needed. It also enables track and trace by assigning standardized product and location identifiers that can be captured and stored automatically at every point in the supply chain, maintaining those unique identifiers throughout a product's journey for reliable information exchange and traceback capability. Fully implemented across the supply chain, standards keep products from ending up 'lost' in the chain, delaying or complicating inventory and availability for use."

But while inherently valuable, it's not enough just to adopt and implement data standards, according to Fernandez.

"The key to making the most of standards is full implementation of a well-managed data quality program that is incorporated in day-to-day operations," she insisted. "Pharmaceutical manufacturers have been building their technology and data management infrastructure for several years now, leveraging GS1 Standards to meet regulatory requirements and improve supply chain visibility. As healthcare providers obtain scanners and train personnel on how to use them at point of care, all of the relevant product data can be captured, shared and accessed by stakeholders for full traceability."

Carl Gomberg, Lead Solution Analyst, ITS Cost Management, Premier Inc.,

recognizes that emerging requirements under the Drug Supply Chain Security Act motivates the pharmaceutical industry track-and-trace efforts using systems and standards, including Electronic Product Code Information Services (EPCIS) and Global Location Number (GLN) to monitor end-to-end logistics, prevent theft and stop counterfeit product before it enters the supply chain. The leap to managing vaccine distribution and administration isn't a difficult one, he added.


Carl Gomberg

"Couple this with Health Information Exchange (HIE) under Meaningful Use – which facilitates electronic transport of patient data from medical records – and we could record and share if a patient has received a vaccine, garnering supply visibility down to the lot number," Gomberg indicated. "With COVID-19, there is a critical need to accurately identify and match people to their vaccine administration data since there are multiple vaccinations available, some requiring multiple doses, and people may receive their first and second vaccine doses in different locations."

Further, Gomberg opines that this process could be applied to personal protective equipment (PPE), expanding the use of Unique Device Identification (UDI) beyond recording implantable devices in patient medical records also to include PPE in clinical environments to better track usage and need.

To each his/her own

Yet, the key COVID-19 vaccine manufacturing and distribution services have concentrated their efforts on bulk container-based supply chain tracking and tracing and temperature monitoring, according to Chris Caulfield, Vice President, Temptime Operations, Zebra Technologies.


Chris Caulfield

"The Biden Administration's desire to accelerate vaccination throughput via a network of mass vaccination sites and retail pharmacies will require the addition of a strong vial-based focus to vaccine supply chain tracking and tracing and temperature monitoring," Caulfield urged. "This is due to the workflows at local vaccination sites, including onsite vaccine vial management, patient injection recordation, second dose administration tracking, and wastage rate data collection. All of these workflows require vial-level information that lends itself to 2-D bar coding and scanning – as an alternative to manual data entry.

"Moreover, the data needed to identify counterfeit product or support product recalls will require vial-level detail," he added.

Caulfield recommends that in the short term, 2-D bar code and scanning technology can help fulfill the track-and-trace goal, consistent with the policy noted in the Drug Supply Chain Security Act of 2013.

Vaccine manufacturer-affixed RFID tags on multi-pack boxes can help, too, as they can be scanned at any point in the supply chain, according to Caulfield. "This enables automated visibility of product shipments at the lot/batch level and accountability for vaccine dose management until the last mile delivery. RFID tags provide another layer of anticounterfeiting technology and allow an automated means of expediting vaccine dose receipt, distribution, and use," he added. Further, using the GS1 standard to represent "item identification and other extended data fields will enable all supply chain operations to encode and read this data without the need for proprietary or custom arrangements."

Carl Henshaw, Director, Standards Implementation, Vizient, homed in on the product temperature requirements as a valid and reliable reason for tracking, tracing and data standards use.


Carl Henshaw

"The Moderna and the Pfizer vaccines are both based on mRNA technology that requires much colder temperatures to remain stable. For example, the Pfizer COVID-19 vaccine must be stored between -112 and -76 Fahrenheit," Henshaw said. "To effectively administer these types of vaccines, the ability to demonstrate that the Cold Chain remains unbroken is critical. Standards from the Drug Supply Chain Security Act (DSCSA) require that to remove the threat of counterfeit and stolen products from the market, the chain of custody must begin with the manufacturer, continue on to the distributor and then the pharmacy. Those data standards include labeling the various levels of vaccine packaging and ensuring material handlers at vaccine sites have machine-readable codes for appropriate tracking."

The U.S. Food and Drug Administration (FDA) requires items, like PPE, bear a unique device identifier (UDI) for that data to be submitted to the federal agency's Global Unique Device Identification Database (GUDID). The UDI represents the combination of a device identifier (GTIN/UPN/ISBT128) and a production identifier (lot/batch/serial number/expiration date, manufactured date).

"While many manufacturers apply barcodes that meet these requirements already ahead of schedule, not everyone does because it is not yet mandated," Henshaw said. The FDA began phasing in standards by device class in 2014. The final phase, involving Class I and unclassified devices, of which PPE is categorized, has been postponed twice with the requirement to comply pushed to September 2022.

"Once UDI standards are fully implemented, tracking PPE will be easier," he assured.

Four-leafed closer

Carrie Gorman, Account Executive, Healthcare, Tecsys Inc., encapsulates the premise and promise of global data standards in four ways.

The first involves demand planning and forecasting, which emerged as a hot button at the start of the pandemic in early 2020.


Carrie Gorman

"Global data standards – worldwide, not just at a federal level – can provide manufacturers with actionable data to enable accurate volumes of vaccine production and be much better prepared when the next pandemic or emergency comes along," Gorman said. "This is the No. 1 lesson that COVID-19 has taught us with regard to PPE: There wasn't a shortage of PPE as much as there was a shortage of data that manufacturers needed to produce the right quantity of PPE. Applied to a two-dose vaccination effort, consistent data standards ensure accurate data is shared with the state and the manufacturer to report actual regional demand for second doses."

The second spans interoperability.

"Consistent data standards around the world would mean that all systems can digest, store, track and share the same data across systems," she continued. "This is a challenge today in healthcare procurement. One distributor may abbreviate the [Unit-of-Measure] (UOM) Case as CA and another distributor uses CS. When data like UOM is inconsistent, the systems usually need to be manually updated to ensure accuracy. Aligning on a standard would eliminate the risk of ordering the wrong item or the wrong quantity of items."

The third covers traceability.

"As basic as it sounds, consistently applied data standards allows for accu-

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rate reconciliation of the location of vaccines during transport and administration processes — enabling a true and complete chain of custody," Gorman indicated. "Unfortunately, today, this level of data is not consistent across state lines or countries, which fragments the data being used to report on distribution and administration. That degree of visibility means if there is an error that occurs during the distribution process – truck is in an accident, vaccines are spoiled in route or late to the site – having accurate data standards can help easily identify which vaccines were impacted."

The fourth ensures labor optimization.

"From an efficiency standpoint, juggling data standards is a major drain on labor," she noted. "One large health system's Cath Lab administrative director estimates the annual cost for participating in and supporting cardiac data registries is over $1 million and employs 15 highly skilled registered nurses."

Gap analysis

As a snapshot of supply chain organization and momentum, COVID-19 vaccine production, distribution and administration has unearthed several questions and concerns that are inherently solvable, according to Ashok Muttin, Founder & CEO, SupplyCopia.

"Tracking vaccines from the point of manufacture through distribution to the point of care – wherever that may be – has illuminated more of the gaps we have in supply data standards," Muttin noted. "While COVID-19 vaccine lot data is consistently identified and tracked, challenges occur in the last mile of distribution, and disparate systems make it difficult to bridge gaps. At the end of this process, do we know where all of the data will be and how to access it? How much is now on paper? What processes are in place to gather data from different locations? We have to close these gaps. Yet, it's easy to see how challenges are exacerbated in the example we're living through today, with vaccines requiring multiple doses, and potentially booster shots that also must be tracked."

Better supply chain tracking mechanisms would help identify "wastage" and whether damaged vaccines are destroyed, helping to prevent black market resale of damaged doses, Muttin observes.

Muttin believes that improving visibility to PPE, which experienced seemingly insatiable demand during the last 14 months, can be achieved today. "With more consistent capture of product identification data, it becomes easier to track and understand PPE throughout a healthcare system, even across the industry and globe," he insisted. "Accurate demand planning – and supplier risk analysis – become reality with consistent application of product identification data."

But Muttin cautions about persistent challenges to demand planning efforts that include a "vast array of suppliers based outside our traditional boundaries, with their own PPE requirements, and political situations that influence exporting abilities." This can include a container ship, for example, that runs ashore and blocks a canal used in global shipping routes.

"Consistent, global product identification builds greater visibility to these suppliers, while allowing providers to understand opportunity and risk," he noted. "For accurate demand planning at the local level, an organization has to connect in real time to the number of COVID-19 cases, in a particular geography, down to the ZIP code level." **HPN**

Using drug, supply data standards to make MVPs out of MVCs

by Rick Dana Barlow

Stemming from the healthcare reform measures of the 1990s that led to the creation of integrated delivery networks (IDNs), few will argue against vertical integration being a more highly favored business model than horizontal integration of participating facilities.

But those IDNs covered public and private, not-for-profit and investor-owned healthcare providers, and to a lesser extent, federal government-operated hospitals.

For the last six of 15 months of the pandemic, the ability of state and county healthcare organizations to administer COVID-19 vaccines to the public in mass vaccination centers (MVCs) best resembles cat herding as they circle the wagons.

In fact, *Healthcare Purchasing News* unofficially observed four different vaccination sites – three MVCs and one retail outlet. Two of the three MVCs were located in suburban Chicago while the fourth was located on the far western side of the state in a rural area just east of the curving Mississippi River.

All four displayed varying stages of automation/electronic ability. The retail outlet demonstrated the highest level of automation with online registration and scheduling, bar coding for check-in and dose-vial matching and then electronic data sharing with the patient's ordering history linked to the patient medical record shared with the doctor and participating hospital.

Read the the full sidebar online at
https://hpnonline.com/21222300

Pharma's got data standards game so what's med/surg's excuse?

In terms of supply data standards adoption and implementation, few legitimately can doubt or even question how far along the pharmaceutical industry is when compared to the medical/surgical supply industry.

Might the COVID-19 vaccination process – from manufacturer through distributor through administration site to the patient – serve as something of a motivator to showcase definitively the benefits of supply data standards adoption and implementation? If anything, experts contend the process represents an active case study to test and implement solutions for the larger industry.

Read expert contributions at
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OPERATING ROOM

Perioperative protection

Maintaining a sterile field guards patients, staff from infections

by Ebony Smith

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Many factors contribute to the onset of surgical site infections (SSIs) and other healthcare-associated infections (HAIs) while patients are in the operating room, recovery and treatment during hospital stays. Patients are highly susceptible to these infections by nature of this critical care, types of procedures and sterility of equipment, their health status, as well as the surfaces, people and environments around them.

"Truth be told, every hospitalized patient is at risk of acquiring an SSI or HAI simply by receiving medical care or undergoing surgery, and those risks are well documented," expressed Eric Jungslager, Vice President of Healthcare, GP PRO. "Some of that risk stems from the patient — their age and gender, their tobacco use, their weight or if they have a pre-existing medical condition like diabetes."

He continued, "Some of that risk is more application-based — the surgical technique that's used, whether or not catheters are used, and the patient's length of stay. Of course, there are environmental risks, such as the cleanliness of surfaces, the quality of air filtration and the efficacy of water management systems. And there are risks associated with human contact from both healthcare practitioners and patient visitors — having unclean hands, wearing non-sterile gowns or gloves or failing to wear a mask."

These infections happen frequently and are life-threatening.

"Infection at the surgical site remains the second most common adverse event occurring to hospitalized patients and a major source of morbidity following surgical procedures," indicated Shawn Malek, Sales and Marketing Manager, Far UV Technologies, Inc. "Infections are more likely to occur after surgery on parts of the body that harbor lots of germs (or are susceptible to cross-contamination). Surgical site infections have been shown to increase mortality, readmission rate, length of stay and cost for patients who incur them."

According to Deva Rea, MPH, BSN, BS, CIC, PDI Healthcare, "Some potential procedural-, environmental-, and pathogen-related risk factors would be:

- Emergent/complex procedure
- Preexisting infection/colonization
- Hair removal method
- Skin prep/nasal decolonization
- Antibiotic prophylaxis (timing, choice, dosing)
- Glycemic control
- Blood transfusion
- Aseptic technique/surgical scrub/ gloving
- Skill/technique
- Duration of surgery
- OR ventilation, traffic, equipment/ surfaces."[1]

She added, "Risk factors that are potentially able to be modified are diabetes/ glucose control, obesity (BMI >30), smoking, malnutrition and immunosuppressive medications. Unmodifiable patient risk factors include advanced age, recent radiotherapy and history of SSI/ skin infection."

Repelling infectious agents

Pathogens exist throughout hospitals and healthcare facilities and pose a threat to patients and staff.

"The perioperative environment is an area of high risk for cross-contamination," emphasized Dana Goossen, MSN, RN, Senior Clinical Consultant, Northeast Region, Ansell Healthcare. "Inadequate cleaning and room turnover procedures put patients and healthcare workers at risk of injury, healthcare-associated infections (HAIs) and surgical site infections (SSIs). The lack of barrier protection in reusable linens exposes patients, increasing the risk for HAIs and SSIs. In addition, there are growing concerns regarding airborne particles and the role it plays in the development of SSIs. Efforts should be taken to reduce debris and particulate in the OR by evaluating materials with lower lint levels.[2]

Protective barriers on patient beds can help improve patient care and safety, notes Bruce Rippe, CEO, Trinity Guardion, Inc.

"Mattresses are the #2 caregiver touch point in a patient room and a recent SHEA presentation demonstrates 72% of hospital mattresses are not safe, making them a significant patient safety concern. Mattresses routinely come into contact with non-intact patient skin and clinically relevant fluids requiring mid-level disinfection. Contaminated mattresses offer a bevy of transmission modes, such as through the hands of caregivers or wounds from surgical incisions, pressure ulcers, burns, etc.," he indicated. "Research continues to show that mattresses play a major role in infection risk, a problem that must be addressed to protect patients."

See webinar: 3 Cleaning and Disinfecting Mistakes that Put Patients at Risk at https://hpnonline.com/21147507.

Patrick Kammer, Managing Director/ CEO, C Change Surgical, adds, "Disruption of sterile barriers can result in contamination. Clinicians have long reported that a single layer of plastic for making sterile ice is not always sufficient."

Further, Don Lowe, Spokesperson, ProTEC-USA, points out, "Inferior PPE must be considered as a risk when in a surgical site infection (SSI) or healthcare-associated infection (HAI) situation. Too many 'upstart' and 'opportunistic' sellers of PPE have jeopardized the health of those that wear and those that come in contact with those that wear such poor quality products. (Facilities should) institute and practice a solid strategy and process for assuring sufficient supply of high-quality PPE is available at all times, regardless of the current need or anticipated short-term requirements."

At Virginia Mason Medical Center, part of Virginia Mason Franciscan Health, their staff keeps a constant pulse on patient infections and safety, stresses, Charleen Tachibana, RN, Senior Vice President for Quality, Safety and Patient Experience.

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"As part of our longstanding commitment to quality and safety, Virginia Mason Medical Center has a multi-disciplinary effort focused on preventing HAIs, which can include surgical site infections. Our effort brings together leadership, clinicians and non-clinicians and frontline staff to use evidence-based practices to prevent adverse events, such as central line-associated blood stream infection; catheter-induced urinary tract infection; hospital-onset C. difficile infection; colon surgery site infection; hospital-onset MRSA bacteremia; and abdominal hysterectomy surgical site infection," she shared. "Also, we will continue to track our success through our comprehensive HAI surveillance methods and performance quality measures. This allows us to document our progress against internal and external benchmarks."

Fighting antibiotic resistance

Another emerging threat to patients contracting SSIs and HAIs is the medicine used to treat and protect them – antibiotics. They are growing less effective based on several factors.

Noam Emanuel

Noam Emanuel, Ph.D., Co-founder and Chief Scientific Officer, PolyPid, explains, "In addition to breaking the skin's natural defense against bacteria, surgery requires stopping blood flow and thus attenuates the recruitment of the body's primary defense against infections via the immune system to the area being operated on. Blood flow remains interrupted for several days following surgery, until it fully resumes and reaches the incisional site, potentially exposing a patient to the rapid growth and the establishment of invasive bacteria. While antibiotics administrated shortly prior to surgery would help patients stave off incoming bacteria, only a small fraction of systemically administered antibiotics reach the wound before being cleared through the kidneys and liver. These limitations can render systemically administered antibiotics inadequate in preventing SSIs and therefore require localized administration to eradicate any residual bacteria."

He continued, "Local antibiotic solutions often use either polymer- or lipid-based formulations. Over the years, neither polymer-based nor lipid-based solutions have individually provided anchored, localized drug delivery at customizable and prolonged release rates needed for healing in critical indications. The key is to find the right formulation that combines the key elements of both solutions."

Additionally, he explained, "Antibiotic resistance bacteria can be generated following the use of systemic administration of antibiotics, including systemic antibiotics that are given before surgery. COVID-19 has led to an upsurge in the use of antibiotics, further accelerating the development and the establishment of antibiotic resistance bacteria strains in hospitals and therefore raising much concern."

Joining together to tackle the ongoing antibiotic resistance crisis, "A coalition of organizations representing clinicians, scientists, patients, public health professionals and animal agriculture experts as well as members of the pharmaceutical and diagnostics industries are asking congressional leaders to significantly increase U.S. investments to combat the growing threat of infections resistant to existing antibiotics, and build arsenals of new infection-fighting drugs," announced Infectious Diseases Society of America earlier this year.

The society added, "At least 35,000 lives in the United States and 700,000 lives globally are lost each year to infections that can't be treated with available medicines. Drug-resistant infections, which sicken at least 28 million people in the U.S. each year, add at least $20 billion to American health care costs, the letters note, and as much as $1.2 billion globally. Modern medical advances that include cancer chemotherapy, transplantation, cesarian sections and other surgeries rely upon the availability of safe and effective antibiotics…The COVID-19 pandemic, leading to high levels of antibiotic use as well as increased exposure to resistant infections among hospitalized patients severely ill from the coronavirus, also has highlighted the critical importance of controlling antibiotic resistance and developing new antibiotics to be better prepared for future health threats.[3]

Striving to develop new drug treatments, "A clinical trial to test the antibiotic dalbavancin for safety and efficacy in treating complicated Staphylococcus aureus (S. aureus) bacteremia has begun. The trial will enroll 200 adults hospitalized with complicated S. aureus infection at approximately 20 trial sites around the United States. The trial is being sponsored by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health,"[4] reported the National Institutes of Health recently.

The agency continued, "S. aureus is a leading cause of antibiotic-resistant infection. S. aureus infections led to nearly 20,000 deaths in 2017 in the United States, according to the U.S. Centers for Disease Control and Prevention (CDC). This bacterium is of particular concern in healthcare-associated infections. S. aureus bacteremia—an infection of the blood — often requires inserting a central intravenous (IV) catheter to deliver long courses of antibiotics, an invasive procedure that can involve long-term care in healthcare facilities."

Ensuring surgical safety

What measures can staff take to support sterile equipment, rooms and patients' bodies during procedures and care?

Trinity Guardion's Rippe commented, "The Joint Commission recently stated that staff must familiarize themselves with manufacturer's instructions for use for all medical devices as it pertains to cleaning and disinfection as well as other required preventative maintenance. Mattresses are a semi-critical medical device and represent a significant capital investment. All team members must acknowledge the risk associated with a contaminated environment and recognize their unique role in preventing SSIs and HAIs as well as the impact that improper cleaning processes may have on the expected mattress life. Medical facilities must use the latest peer reviewed research and data to determine if current infection prevention measures are out of date and if new strategies should be employed. Facilities should also consider recommendations and guidelines provided by the FDA and CDC."

GP PRO's Jungslager points to other practices staff can take, including, "establishing hand hygiene compliance initiatives, antibiotic stewardship programs and other patient safety protocols that work together to improve patient outcomes. In addition, whether those patient outcome practices are in place or not, I believe that every healthcare worker has a personal responsibility to follow hygiene and infection prevention best practices and guidelines as set forth by the Centers for Disease Control and Prevention."

In procedural and care areas, Goossen of Ansell Healthcare, adds, "The CDC recommends use of disposable patient-care equipment for preventing transmission of infectious agents.[5] Disposable linens and patient positioning straps are two areas where there is an ongoing shift to disposable products to help ensure the safest environment for patients and staff in the perioperative setting."

Further strengthening infection control protocols is another tactic moving forward, advises Rea of PDI Healthcare.

"The COVID-19 pandemic disrupted healthcare tremendously," Rea stated. "This undoubtedly caused breakdowns in basic infection prevention practices. Now we are seeing some outcomes of these breakdowns,

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with increases in HAIs, such as central line-associated bloodstream infections (CLABSIs). Now it is of utmost importance that we arm staff with education and tools to ensure they are well versed in the basic infection prevention practices. To encourage good outcomes and compliance, a robust monitoring of infection prevention processes, along with constructive feedback is also essential." HPN

References at https://hpnonline.com/21222173

Measures and tools to control SSIs and HAIs

How have hospitals and healthcare facilities protected patients against cross-contamination and infections? Industry representatives share these insights.

"The Crothall EVS team plays a critical role in healthcare-associated infection (HAI) prevention at Virginia Mason Medical Center. Every tool, product, protocol and training we employ is designed to impact HAI incidence. The EVS team has a shared responsibility with the organization to stop HAIs by prioritizing areas that pose immediate safety risks. Our EVS team has identified five pillars that help prevent HAIs: hand hygiene, process, measurement, augmentation and emerging solutions. The EVS management team performs monthly and annual trainings with all employees. The team also partners with the hospital's Infection Preventionist to review monthly inspections and adenosine triphosphate (ATP) swab testing results. ATP monitoring is a rapid-test method we use to assess the cleanliness of surfaces."

Brian Byers, Director of Environmental Services, Virginia Mason Medical Center, which contracts with Crothall Healthcare for on-site environmental services. Byers was part of the center's Eliminate Health Care-Associated Infections Team, which won the center's 2020 Mary McClinton Patient Safety Award.

"The CDC found that there were an estimated 110,800 SSIs associated with inpatient surgeries in 2015. Of those SSIs, *S. aureus* was the most prevalent SSI pathogen for most types of surgery.[6] The CDC's 'Strategies to Prevent Hospital-onset *Staphylococcus aureus* Bloodstream Infections in Acute Care Facilities' recommends skin decolonization with chlorhexidine gluconate (CHG) and nasal decolonization with an antibiotic or an iodophor (povidone iodine) antiseptic for prevention of device-associated infections, as well as SSIs. This decolonization strategy would be appropriate for high-risk surgical patients and high-risk patients in the ICU setting, or patients with central or midline vascular catheters.[7] Three months after Duke Raleigh Hospital implanted povidone iodine nasal decolonization in their orthopedic surgeries, they had a 60% decrease in SSIs.[8] They found 'preoperative nasal povidone iodine decolonization to be a safe, efficient and cost-effective strategy in reducing SSIs in elective orthopedic surgeries.'"[8]

PDI's Profend Nasal Decolonization Kit

Deva Rea, PDI Healthcare

"AORN issued infection prevention guidelines that recommend covering the sterile field during periods of prolonged, ambient exposure to protect against airborne contaminants. As advanced infection prevention technologies come to market, surgical teams can evaluate and adopt products that automate infection prevention. SurgiSLUSH delivers a fully automated, closed system with sealed containers to cover and protect slush until needed, erasing prolonged exposure and sterile barrier surprises."

Patrick Kammer, C Change Surgical

SurgiSLUSH - C Change Surgical

"Through the use of the Soteria Bed Barrier, hospitals have been able to decrease their infection rates and keep patients safer as well as extend the life of their mattresses. Customers have reported C. diff reductions between 30-50%. Our peer-reviewed research shows that hospitals can achieve a 99.9999% reduction in harmful pathogens on the mattress surface and up to a 50% reduction in C. diff infections without increasing pressure injuries when using the barrier. Research shows disinfection methods incapable of producing a 99.9999% reduction of spores puts patients at risk of acquiring C. diff. The barrier process allows hospitals to focus on providing quality patient care while decreasing patient risk."

Bruce Rippe, Trinity Guardion, Inc.

"Our customers have worked to decrease and control bacterial, viral or other contaminants by partnering with Ansell for process improvement and product solutions. We offer a variety of continuing education programs and have assisted our customers with AnsellAdvisOR to help mitigate infection risks by identifying opportunities to improve safety, increase efficiency and reduce costs. Product solutions, such as antimicrobial linens, provide an added layer of protection from pathogens. Ansell's STAT-BLOC Antimicrobial Linens have been tested and proven to kill 99% of COVID-19 when exposed to the antimicrobial backing and are 99.9% effective against MRSA, CRE and *E.coli.*"[9]

Ansell STAT-PAC O.R. Turnover Solutions

Dana Goossen, Ansell Healthcare

"One of the biggest challenges we hear as it relates to hand hygiene compliance is securing sustained compliance, which, of course, is key to the long-term advancement of infection reduction. That sustained compliance requires a comprehensive approach to hand hygiene performance management that balances leadership engagement, education, positive feedback, individual accountability and ease of use, such as provided by GP PRO's SafeHaven Personal Hand Hygiene System. In fact, early clinical trials of the SafeHaven System showed a 183% increase in hand hygiene events with more than six months of sustained compliance improvement."

GP PRO's SafeHaven Personal Hand Hygiene System

Eric Jungslager, GP PRO

"Far UV Krypton disinfection lights can be used to reduce the viral load in an operating room and dramatically reduce the risk of infections. These lights are safe and effective to be used in occupied spaces for disinfection of air and surfaces."

Shawn Malek, Far UV Technologies, Inc.

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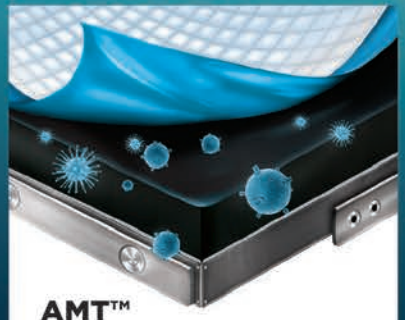

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CS CONNECTION

Pandemic punctuates off-site, on-site reprocessing decisions

by Kara Nadeau

Photo credit: hkama | stock.adobe.com

What is the best approach - reprocessing surgical instruments on-site in each hospital or surgery center, in a centralized location within a health system that serves all of its surgery sites, or in an off-site facility away from the point of care?

Over the years, *Healthcare Purchasing News* has explored the pros and cons of each approach, the last time being June 2020 as hospitals and surgery centers struggled with COVID-19-related elective surgery delays and cancellations. At that time, *HPN* asked the question: Will the pandemic change where and how instruments are processed?

Based on insights from Central Service/Sterile Processing & Distribution (CS/SPD) department professionals, product and service providers, and others in the industry, it seems COVID-19 has driven some changes in reprocessing practices, but there are other factors at hand that have influenced where reprocessing takes place even more.

COVID-driven changes

Dr. Hudson Garrett Jr., Adjunct Assistant professor of Medicine, Division of Infectious Diseases, University of Louisville School of Medicine, knows of several facilities that have been forced to move reprocessing activities into different areas to remain compliant with Centers for Disease Control and Prevention (CDC) guidelines for social distancing.


Hudson Garrett

"This is a common occurrence and can create delays in endoscope availability," he stated. "Most other healthcare facilities that I am familiar with are not making any major changes related to reprocessing in the midst of the pandemic."

While she has not seen specific shifts to off-site reprocessing due to COVID-19, Sharon Greene-Golden, BA, CRCST, CER, SME, FCS, oneSOURCE consultant and Manager, Adventist Health Care Shady Grove Medical Center, says some hospitals have altered course, driven by the pandemic.


Sharon Greene-Golden

"Hospitals may have made some changes in their processes due to having to close one institution and still have instruments available, but the process would only change in the pick-up and delivery of said instruments," noted Greene-Golden.

"We were fortunate to continue working as a normal sterile processing department due to the need of our services throughout the hospital," she added. "We still had the Cath lab, Labor & Delivery, Cancer Center and the Emergency Department using instruments that needed to be processed daily. Each hospital in our healthcare system was able to maintain complete processing control during this pandemic."

What drives introspection?

As COVID-19 has impacted the volume of surgical procedures, with hospitals intermittently delaying elective surgeries when faced with surges in SARS-CoV-2 virus patients, many CS/SPD teams have taken the opportunity to evaluate their operations.

"With COVID slowing surgical programs across the country, a lot of facilities utilized this slow down to make improvements to the existing SPD or consolidate multiple SPDs on one campus," said Steven Sutton, Global Head of Planning & Design, Belimed. "Although the exploration of the off-site reprocessing model is certainly trending still, I don't believe the pandemic has significantly impacted that trend."


Steven Sutton

Kathy Shepherd, Senior Inside Sales Representative, Scanlan, says a number of her company's partners have taken the opportunity to review their strategies and processes this year.

"CS/SPD staff faced a number of challenges from changing needs of patients, providers and staff morale, which all had an impact on each teams' ability to deliver excellent results on time and in full every time," she commented. "The most consistent challenge we helped our partners with this year was addressing communication needs between the greater facility, the CS/SPD teams and internal communication. A number of our partners found they were able to improve communication by addressing processes and implementing communication solutions."


Kathy Shepherd

When COVID-19 hit the U.S. in early 2020, some hospitals chose to put on hold any plans for reprocessing changes, but in 2021 there appears to be a renewed desire for advancement, explains John Kimsey, Vice President of Operations, STERIS Instrument Processing Solutions.

"COVID's impact in 2020 caused hospitals to pause on any strategic decision making concerning off-site reprocessing. Those interested in moving towards off-site reprocessing maintained their interest but were forced to fully shift focus to the pandemic. As hospitals are returning to the new normal operations, the interest in off-site reprocessing and/or centralized reprocessing is returning. Overall, STERIS hasn't seen the pandemic changing the way instruments are processed but rather only delayed hospitals' planned changes."


John Kimsey

One health system that has taken a proactive approach to reprocessing changes is Ohio State University Wexner Medical Center. According to Kimberly Jones, BA, CRCST, Director of Central Sterile Supply, Main Campus, they opened an off-site processing facility in February 2021 to help

address the capacity needs and meet the demands and future needs of the health system (see sidebar).

Kimberly Jones

Single-use device reprocessing

Lars Thording, Vice President of Marketing and Public Affairs, Innovative Health, indicates that the COVID-19 pandemic has also dramatically changed the way hospitals and hospital staff view single-use device reprocessing.

Lars Thording

"Since summer 2020, we have seen an uptick in hospitals that want to use reprocessed single-use devices – and a significant increase in volume from our existing hospital partners," Thording stated. "I attribute this to two things. First, since the personal protective equipment (PPE) shortage, hospital staff have developed a new mindset about reuse. They are thinking twice before throwing away a used device. Second, the financial hit to hospitals from the pandemic has increased the level of importance associated with cost savings. Single-use device reprocessing reduces costs without adding risk and ultimately equips financially strained hospitals to provide better patient care."

Don't make it all or nothing

Rather than keeping CS/SPD operations on-site at each hospital, or moving everything off-site to a separate facility, many healthcare organizations continue to consolidate reprocessing to a single hospital within their network.

"Within the Chicago market, we have not seen any dramatic change in reprocessing strategies. However, we have all seen several large integrated delivery networks (IDNs) move to a centralized reprocessing approach (e.g., UPenn, University of Iowa)," said Jodi L. Eisenberg, Chief Quality Officer, Vested Medical. "What is important to consider is the misconception that it's an all or nothing decision. What might be more appropriate is to think about the optimal approach for each type of surgery and to have an option to select either an on-site or an off-site alternative, depending on the criteria. Additionally, while it might be possible for a large IDN to invest $80 million in an off-site reprocessing center, how realistic is it for the community-based healthcare facilities and the stand-alone ASC that need options?"

Jodi L. Eisenberg

Eisenberg says she has seen some health systems keep most reprocessing on-site, while leveraging an off-site facility as a "pressure-relief strategy for the most challenging surgeries."

"Two examples are total hip arthroplasty (THA) and total knee arthroplasty (TKA) that rely heavily on loaner trays and are very challenging for most sterile processing teams," she said. "Off-loading these surgeries provides immediate relief for SPD staff but also provides a contingency when it makes sense to sterilize on-site."

Dr. Garrett has seen movement towards centralization for a variety of reasons, most notably standardization of reprocessing, reduced costs and the ability to preserve valuable real estate.

"There are some disadvantages as well from potential delays in device availability," he said. "The FDA has also recommended eliminating the reprocessing process for high-risk procedures, such as endoscopic retrograde cholangiopancreatography (ERCP) due to the potential risk for healthcare-associated infections. This can most easily be accomplished by utilizing disposable duodenoscopes."

Impact on ambulatory surgery

It is not just hospitals that have suffered revenue loss from a downturn in elective surgery volumes, ambulatory surgery centers (ASCs) have been equally if not more challenged, notes Vested's Eisenberg.

The impact of COVID-19 pandemic is being felt in all areas of healthcare," said Eisenberg. "Over the past year, we have seen a halt to elective surgeries, which meant a decrease in volumes for both acute settings as well as ambulatory settings. As we stabilize the pandemics effects, healthcare organizations are looking to ways to ramp up the revenue streams. Add to this the recent payor changes to the rules for reimbursement on the ambulatory side, the opportunities are ripe to increase ambulatory surgery volume."

But a sharp increase in ASC procedure volumes poses challenges to on-site reprocessing, according to Eisenberg, prompting some to consider a switch to off-site/outsourced CS/SPD operations.

"Unfortunately, many of these ASCs do not have the capacity nor a sufficient team of properly trained sterile processing staff," she said. "Some of the surgeries that are being pushed to the ambulatory setting include orthopedics. These elective surgeries require the use of complex surgical instrumentation and implants, which are delivered in the form of loaner trays, in most cases, less than 24 hours prior to the surgery. Space, capacity and staffing in the current ASC model don't appropriately support this care. This is where off-site reprocessing gains more support because, like many other hospital services, there are benefits to outsourcing this activity to a more production-oriented, quality-focused partner."

Reasons for reprocessing shifts

Whether a healthcare organization is revamping its on-site CS/SPD operations, centralizing them to a single hospital or moving everything to an off-site facility, the decision takes careful consideration, and the process can be both complex and challenging. Here is advice from those who have experience doing it.

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Communication, collaboration key to OSU Wexner off-site reprocessing success

In 2017, Ohio State University Wexner Medical Center (OSU) examined the growth plan across its enterprise for surgical volume and determined that given the current footprint of Central Sterile Supply (CSS) across the enterprise, building a freestanding CSS hub was the most strategic financial solution for the organization.

In planning the facility, CSS team members played an integral role in the facility design, which features abundant natural light and evolutionary state-of-the-art equipment. From a growth perspective, the building was designed to accommodate the current state surgical volume, as well as the future state of surgical services through the year 2027. OSU opened its new off-site CSS in February 2021.

"Operational preparation and collaboration with our operating room (OR) partners could not be understated," said Kimberly Jones, BA, CRCST, Director of Central Sterile Supply, Main Campus, OSU. "We worked tirelessly with our clinical partners to examine current processes involving OR and CSS. Ultimately, we collectively reevaluated current practices and made modifications preemptively to accommodate the off-site facility. Additionally, we involved our surgeons early on to obtain the necessary buy-in and support to go live with new workflows."

"Some of the lessons learned within the first 30 days after opening the facility relate to communication, follow through and continued partnership with our subject matter experts," Jones added. "Having had a successful relationship with theses partners prior to go live has enabled open communication when processes need to be modified."

"My biggest piece of advice is to consider the pre-work and preparation involved," said Ash Crowe, MHA, Project Manager, St. Onge Company. "Going off-site is a huge culture shift that requires good communication, standard practices and collaboration between sterile processing and operating room (OR) leadership. Any cracks in communication or processes that exist now will become much bigger issues if not addressed prior to going off-site."

OSU Wexner's Jones agrees. "Addressing the communication issues was key in the success of planning a facility that provides a sterile and quality product for our clinical partners and most importantly our patients," she added.

Kimsey notes how the movement of operations "as is" to a centralized or off-site model will only compound any current operational issues the organization is experiencing.

"Centralizing or utilizing an off-site reprocessing center provides the perfect catalyst for a process improvement program to address operational issues, such as missing instruments, point of use cleaning and returning instruments to the correct trays post procedure, SPD compliance to instructions for use (IFU), staff education, proper staffing levels, and capacity restraints," he commented. "Take this strategic decision as your opportunity to address the root cause of your current operational issues before you move off-site or centralize."

Before making a shift to centralization, Dr. Garrett recommends the organization conduct a time-in-motion study to determine if there is truly a cost or procedural time savings that will result from centralization.

"Many times, the perceived benefits are outweighed by risks and/or delays in instrument availability," he said. "You must also consider transportation of the soiled devices to ensure compliance with hazardous medical waste transportation regulations. Finally, are the personnel that will be reprocessing the devices in the central locations properly trained in reprocessing the devices."

According to Eisenberg, making the decision to keep sterile processing on-site or not relies mostly on quality, efficiency and cost aspects.

"Talk to those who have done it to evaluate what worked and what didn't work," Eisenberg advised. "Strongly consider working with a partner who offers a collaborative approach to outsourcing and the opportunity to start in a focused way with the opportunity to expand as data and results warrant. Establish clear channels of communication with vendor partners. These partners need to understand and determine what is considered urgent versus what is elective. There must be visibility into the logistics and planning to all stakeholders. A major consideration for all should be on the use and efficient processing of loaner equipment."

For those organizations considering a transition to off-site reprocessing, Sutton suggests they do the following:

- Talk to people who have already done it.
- Find reliable partners with recent, relevant, experience, including:
  - Equipment vendors
  - Real estate developers
  - Instrument tracking suppliers.
- Designate an internal project team that includes key players from almost every part of the organization to assist with the investigation.
- Start the study with an end goal in mind. The team must have a clear picture of where the health system is headed in the next five to 10 years. Also, any major upgrades to existing CS/SPD departments should be suspended until the study is complete.
- Create a transition and implementation plan while the building is being constructed or up-fitted.

CS CONNECTION

The future of reprocessing

COVID-19 came out of nowhere and devastated the U.S. healthcare industry. Nobody knows what the future may hold but based on current trends, healthcare organizations must take steps to improve the sustainability of their reprocessing operations. Many see the trend toward consolidated and off-site reprocessing growing in the years ahead.

"I am optimistic that COVID-19 has taught us many valuable lessons as a healthcare industry, one of which is that a constant vigilance to infection prevention and control is necessary to reduce patient harm and also ensure the safety of reprocessing personnel," said Dr. Garrett. "Healthcare has certainly faced many challenges over the past decades, but none with the long-lasting impacts associated with the COVID-19 pandemic. Healthcare systems and providers must adapt and overcome, particularly as it relates to staff resiliency and also pandemic preparedness."

"Reprocessing as a whole must evolve to protect both the patient AND the reprocessing personnel, especially when potentially dangerous pathogens may be aerosolized into the air following aerosol-generating procedures and reprocessing," he added.

"While STERIS hasn't seen significant changes in reprocessing strategies, we are continuing to see a slow but steady trend towards consolidation and off-site reprocessing," noted Kimsey. "These moves are long-term strategies by healthcare systems to address infrastructure issues as well as operational and clinical best practices while planning for future growth and requirements. We anticipate this steady trend will continue for the foreseeable future."

"The best practices our partners have been sharing with us are the importance of having a solid and flexible approach to any changes, exploring the possible unintended consequences of any changes and setting clear expectations both internally and externally with any teams affected by changes to workflow processes," said Scanlan's Shepherd.

"We are witnessing the beginning of a shift that focuses more on quality, efficiency and standardization," Eisenberg explained. "In the next five to 10 years, I believe off-site will be a standard in the industry. Once you unlock the value of off-site reprocessing, it is hard to imagine going back to a less optimal solution. Instead, what is likely to happen is more and more innovation will come into the solution space. Companies that today work on only one part of the problem, such as technology or logistics, will join together to provide seamless, end-to-end solutions that continue to evolve and develop." **HPN**

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June 2021

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LEARNING OBJECTIVES

1. ***Describe what a process improvement plan is and how it can successfully be implemented in SPD.***
2. ***Discuss the Define, Measure, Analyze, Improve and Control (DMAIC) project completed in an SPD.***
3. ***Describe an actual process improvement project.***

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SELF-STUDY SERIES

CSSD/SPD process improvement projects

Planning facilitates successful implementation

by Sharon Greene-Golden, BA, CRCST, CER

As Sterile Processing & Distribution (SPD) departments all over the world evolve as one of the most key areas of hospitals and surgery centers, how we manage our data and true facts of the many processes performed have become paramount. We can no longer give random information and numbers to the infection control professionals; we must have data to quantify our reports. It has become important to successfully show improvement and that can be achieved through the implementation of process improvement plans.

Effective process improvement plans focus on the needs of the department while considering the attributes of a process and how the end-user will be able to value that information. A process improvement plan can identify the attributes of low-or-no-value processes and remove those, thus enhancing the data derived from the plan. A process improvement plan can eliminate wasted efforts, improve efficiency and quality, help meet regulatory compliance requirements and minimize process completion time. Improvement plans allow the SPD department to work on ways to better maneuver their resources and time management.Striving for improvement involves some type of measurement to identify whether your efforts will achieve specific target outcomes. There are many areas and processes in the SPD department that give way to being targets for improvements. Process improvement plans can allow you to have more accountability and data for the work being provided in the department as an ongoing process. In the SPD department, you can measure with graphs the immediate use steam sterilization, tray errors, cart picking errors, tray preparation time, instrument loss, cleaning of equipment parameters, and this list can go on.

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To have an effective and successful process improvement plan you must have team involvement and buy-in as to what the outcomes should be as well as your end goal for the data retrieved. As the team realizes that the information gathered can only enhance their work process, they will be happier with the collection of data and the outcomes of their improvement. Once you start on the improvement train, it is essential you continue to check all data and maintain those that meet the goal and strive to make the goal of those that were not successful. A solid improvement plan will work when the initial data period is completed. A well-oiled improvement plan can also aid in the engagement of your team members as well as gleaning great ideas of better ways to perform a task by those team members. It is important to remember that using the actual ideas of the team members working on the front lines gives you, the leader, efforts of people who are attuned to how to improve the process, as "they are actually" doing the work daily. In the end, your implementation process requires that you complete their improvement plan. The plan chosen should be one that actual data can be retrieved from work that is presently being done or has been completed.

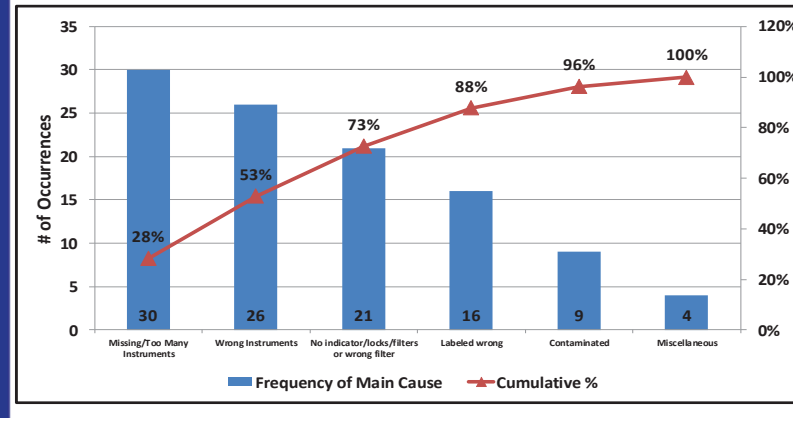
Here at my system, we chose to use the Define, Measure, Analyze, Improve, Control (DMAIC) process to help in our efforts to improve our quality of work. DMAIC is the acronym indicating Six-Sigma business performance methodology that many businesses use to improve their business practice. This effort to produce improvement plans requires five steps, including:

1. First you define and agree on the project and its parameters, which include any financial impact.
2. Next you must measure, which includes the gathering of data that is pertinent, your target, impact and the process map. Your team needs to visually map out the existing steps of the area for improvement.
3. The analyze phase allows you to reveal the root cause (WHY) of the ineffectiveness while seeing where implementation of change can occur. The main objective in the DMAIC is to improve a process that is inefficient and make the needed changes.
4. Once you see the process as it is, then the team is better able to find the areas for improvement. I do strongly recommend letting the team do the mapping, as they know where the holes are as the experts.

ANALYZE: SINGLE CASE BORE

SINGLE CASE BORE	
Reasons or Factors Contributing to Occurrence	Occurrence Total
1) No indicator/locks/filters or wrong filter	21
2) Wrong instrument	26
3) Contaminated	9
4) Labeled wrong	16
5) Missing or too many instruments	30
6) Miscellaneous	4

ANALYZE: PARETO ANALYSIS



ANALYZE: GETTING TO THE ROOT CAUSE

Problem Statements (top 80% taken from Pareto Chart)	Problem 1: Missing or too many instruments		Problem 2: Wrong instrument		Problem 3: No indicator/locks/filters or wrong filter	
Why?	Tray does not contain proper number of each instrument needed for surgery		Tray does not contain proper instruments needed for surgery		No checklist/reminder to include these items in tray	
Why?	Tech did not assemble tray accurately		Tech did not assemble tray accurately		Checklist is not part of the computer-generated tracking system checklist	
Why?	Tech not utilizing checklist correctly		Tech not utilizing checklist correctly			
	Mark (X) to Indicate if Standard Failed People OR People Failed Standard					
	Standard Failed	People Failed	Standard Failed	People Failed	Standard Failed	People Failed
		x		x	x	

Adventist HealthCare

- Determine the Factors Contributing to your Problem
- Use Tools to Get to the Root Cause

Slides courtesy: Adventis HealthCare

Self-Study Test Answers: 1. B, 2. B, 3. B, 4. A, 5. A, 6. A, 7. B, 8. A, 9. A, 10. A

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5. Last you take the data evidence with the new changes for efficient improvement develop metrics and monitor while documenting the success.

I will now walk you through an actual process improvement plan that we are presently working on at this hospital. The Central Sterile Processing Team decided to quantify our accuracy in the processing of instrument trays for patients in the operating room (OR). We needed to know how well our team did in providing accurate instrument trays for surgery. The need for this information was important to the overall care of the patient and our role in case delays, which in some cases can contribute to extra anesthesia during surgery and our potential to impact surgical site infections. The key result areas in the alignment tree for this project were quality and safety.

Our goal was to obtain the target of 100% tray accuracy with our baseline percentage being 88%. The research with the single case bore identified that the main reasons for tray inaccuracy were missing or too many instruments placed in the tray. These root causes were confirmed with a Pareto Analysis. A Pareto Analysis is a method of analyzing the most common contributing causes for an event.

Typically, a chart is created to visualize and bucket your data to identify the main root causes of the specific event. Each area was defined with a specific chart detailing the information needed to improve the daily process. The Analyze chart shows the single case bore, which details all the reasons given for tray inaccuracy. Then we took that information and placed it on the chart defining the Pareto Analysis, which shows in real time the frequency of the main cause of tray inaccuracy, which was for our group the placing of too many instruments not requested on the recipe or not giving them what was required. Next, we moved on to finding out what the root cause was for these tray inaccuracies, which allows us to determine the contributing factors. All these steps found in the graphs pictured show the actual work that is needed to determine the answer steps that will be taken to improve the tray accuracy in this hospital.

Here at this institution, each month the team would open 20 to 30 trays from the shelf using our audit form to evaluate the neatness, presence of an indicator, order of instrumentation according to the checklist and actual accuracy. Our team members in the OR would send a tray checklist back that had noted inaccurate counts for the tray. All the inaccurate tray information would be noted for our accuracy percentage.

This improvement process project was followed for over six months to obtain good, solid data. We then proceeded to find the root cause of trays not being assembled with the correct number of instruments and or indicators. The root cause graph, which answers the question of "why", showed that we had people failure in two areas with a standard failure in one. The root cause is noted in the list of problems numbered from one to three. We proceeded to correct the people failure with education and training making sure our team used the checklist correctly, as this was the root cause of trays not being assembled correctly. Our standard failure was due in part to the tracking system not being complete, so we had to obtain an upgrade to our tracking system, as this contributed as part of the root cause in the standard failure. With education, mentoring and training the percentage numbers began to improve from 88% to 98% for five months in a row. Our team members were able to see the errors in real time and focused on the correction needed to elevate tray inaccuracies.

Our process improvement project allowed this team to increase tray accuracy by 10% while decreasing anesthesia time due to search for missing instruments. We decreased the need for immediate use steam sterilization (IUSS). We have a commitment to best practice and will continue to challenge our team to aim for the 100% target. We are committed to world-class performance for our team and ultimately our patients.

In the quest to implement an improvement plan you must have the involvement of your team, as they will be the stakeholders in the data collection and map processing. The plan can take a few weeks or even a year to effectively determine the success of your plan. In the end, you and your team must determine what was learned what could still be improved and if the DMAIC enhanced the process. You are striving to do better in a work process while showing how effective the team has worked to improve.

SPD departments all over the world can benefit from having factual data available that shows how the processes in the department have become more efficient. It does not take a lot of meetings just plain elbow grease to get in the field and make a process work more effectively. Improvement plan audits will raise the standards and quality in the SPD department.

The process plan implemented in the SPD detailed our exceptional results and proved that the trays were able to be processed from the decontamination room to the storage shelf in eight hours, an improvement of 6.25 hours. It is a team sport and yes, you do need the buy-in of all the stakeholders. Once your team sees their progress and how well it details the work they do daily, you have believers for life. Implementing improvement plans using the DMAIC model, or any other model, will help you be successful in showing actual data to back up all your hard work. HPN

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CSSD/SPD process improvement projects

Planning facilitates successful implementation

Circle the one correct answer:

1. **Effective process improvement plans only require the acceptance of the manager to be successful.**
   A. True
   B. False
2. **There is no value for Sterile Processing & Distribution (SPD) departments to do process improvement plans.**
   A. True
   B. False
3. **Improvement plans can be effectively completed with a week's worth of data.**
   A. True
   B. False
4. **An improvement plan requires a root cause that needs to be changed to make processes better in the department.**
   A. True
   B. False
5. **An improvement plan allows you to showcase with data how you have improved a process.**
   A. True
   B. False
6. **Quality of care benefits for your patients can be obtained through the implementation of process improvements.**
   A. True
   B. False
7. **The only improvement plans allowed for SPD teams involve cancelled loads or positive biological tests?**
   A. True
   B. False
8. **Process improvement plans can effectively help a department eliminate wasteful actions in the daily work practices.**
   A. True
   B. False
9. **One tool used in a process improvement plan is the DMAIC methodology, Define, Analyze, Monitor, Improve and Control.**
   A. True
   B. False
10. **SPD departments need real-time data to quantify information shared in reports to various teams for successful improvement plans.**
    A. True
    B. False

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Striving for continuous improvement in SPD a marathon, not a sprint

by Nicholas Schmitz

When embracing continuous improvement (CI), it might be helpful to liken the process to the old tortoise and hare fable: slow and steady wins the race. After all, it's not about racing across the proverbial finish line, but logging all the incremental steps along the way and viewing CI as an ongoing, sustainable journey to success. To help build a positive and effective CI culture with department-wide team support and involvement, consider following these key steps:

1. **Tie CI efforts to strategy.** When creating a CI strategy, managers and department leaders must ask, "what do we need to do?" and "how are we going to do it?" Through these questions/dialog surrounding them, CI projects can be identified that tie to the organization's/department's strategic goals.
2. **Measure outcomes.** Communication is critical to effective, sustainable CI efforts, and so is effective measurement and documentation of progress. Remember: What gets measured gets done. If performance metrics are not aligned with strategy and specific CI goals, team buy-in will suffer, along with results. Create a scorecard with high-level organizational objectives stated as key performance indicators. Then ensure metrics are aligned to strategy and CI is measured as part of departmental goals.
3. **Gain leadership support and buy-in.** If those in the facility's executive positions embrace a CI strategy, departmental leaders will often follow suit; however, it's not enough for those in the C-suite to just pledge their support; they must show their commitment by building CI expectations into operational goals and compensation objectives. Also, remember that not all individuals who are influential and have the power to shape improvement and drive support hold official leadership titles.
4. **Manage change.** An organization's/department's leaders often have broad and repeated exposure to CI goals and methodologies before they decide to launch CI as part of strategy and operations—and they need to remember that team members are coming into the process later and may need some time to move out of their comfort zone and embrace new ways of doing things. Leveraging training and resources to manage change can help overcome any initial resistance sometimes seen in early stages of change. Proper training, communication and reinforcement can help workers welcome and embrace change instead of avoiding it.
5. **Try just-in-time training.** For the sake of speed, leaders may be tempted to train everyone on any new process or technique that will be introduced as part of the organization's or department's CI efforts; however, if employees won't be applying this new knowledge on the job within days, weeks or months, retention will suffer, and retraining will likely be needed. "Just-in-time" training is best because it allows employees to immediately apply what they've learned. Holding a kaizen event is an effective way to have participants follow a learn-and-go-do cycle throughout a multi-day onsite workshop. Kaizen, a Japanese term for "continuous improvement," is a methodology that serves as a building block for lean production methods.

   Trained and experienced employees should have opportunities to lead others in using the learned skills. Project leaders don't have to come from engineering or operational excellence staff. Team leaders who work on the frontline can use the combination of process knowledge and CI training to lead their co-workers, while reinforcing their own skills.
6. **Celebrate the incremental wins.** CI takes hard work and requires team effort, so taking time to honor and celebrate successes throughout the journey is essential for keeping everyone motivated and focused for the long haul. Use metrics to show progress (consider posting performance charts/graphs throughout the work environment in areas where they are most visible). Seeing progress in that way will help reinforce the processes and goals.

When these steps are built into the culture of the organization/department, the CI process will become stronger and more self-sustaining. When failure arises, it can often be traced to a lack of support and guidance from management regarding the CI goals and strategy. When they openly support and model the expectations, a positive domino effect typically occurs, and the collective team works to mirror the positive change. HPN

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Clearing the air on sterile storage, instrument positioning

by Stephen Kovach

Q The other day I saw some cardboard shipping boxes in our sterile storage area. Is that an acceptable practice?

A As with any practice in Sterile Processing & Distribution (SPD), there should be a standard -operating policy (SOP) in place that addresses sterile storage and acceptable practice for your facility. External shipping cartons and boxes are considered dirty because they have been exposed to unknown conditions. The shipping boxes can serve as generators and reservoirs for insects, dust and other contaminants.

ANSI/AAMI ST 79, section 3.3.6.5 discusses this topic and even suggests having a breakout area/or room located near or adjacent to a surgical or supply processing department. Having a breakout area helps to reduce the introduction of dust, insects, and other contaminants to this supply area.

In my view, it is not an acceptable practice to have cardboard shipping boxes in sterile storage. This should be addressed using your healthcare facility's process for improving poor practice.

Q We had a pre-audit survey to prepare for an upcoming survey. The person doing the survey told us that all hinged instruments must be in the open position for sterilization. They looked at our peel pouches and found many instruments not in the open position. Could we get cited for not having them all in the open position?

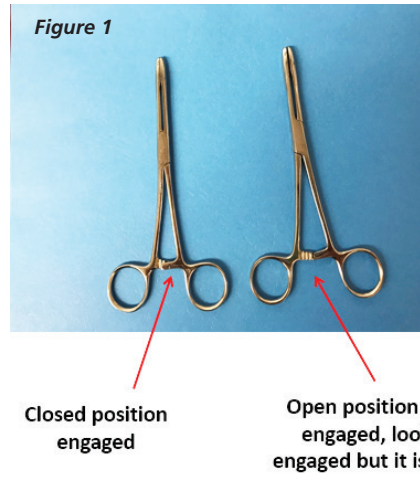
A First, you should have an SOP on this topic. But, my answer is yes for the following reasons.

In September 2018, The Joint Commission, one of the premier surveying agencies, put out a notice stating, "They will also review peel packs to see if items that are awaiting sterilization or have just been sterilized are in the unratcheted position."[1] This could be why your surveyor brought this to your attention.

The new third edition of ST79:2017 now offers clearer guidance on the placement of instruments. Previous editions stated that instruments should be held open and unlocked; this guidance resulted in confusion because some surveyors thought it meant the instruments must be held wide open. In the new version of ST79, the committee eliminated the word "open" to alleviate the potential for confusion. It now states that "ratcheted instruments should be unlatched. Racks, pins, stringers, or other specifically designed devices can be used to hold the instruments in the unlatched position."

So, what is a ratchet? It is a step-locking device on surgical instruments. As the handles are closed, the jaws are also closed and the ratchet holds them in a locked position. The ratchet consists of a notched bar on each handle. The notches are facing and overriding when the handles are closed. A ratchet on a medical device is considered closed once the first (step locking) ratchet is engaged; thus, if it is not engaged, it is considered open.[2] So, you must make sure that ratcheted instruments are not engaged during the assembly process (See Figure 1).

Figure 1



Sterilization depends on the contact of the sterilizing agent with all surfaces for the prescribed time; thus, this can be achieved only if the sterilizing agent (e.g., steam) contacts all instrument surfaces. Hinged instruments, such as scissors and hemostats, should be sterilized in a position to ensure that the sterilizing agent can adequately contact all surfaces [(disassembled or unlatched per the original equipment manufacturer's (OEM) instructions for use (IFU)].

We know that an OEM places wording in their IFU to give direction on this subject, so here is one example of an IFU from an OEM:

"for individual instruments with ratchet locks so instruments can be sterilized in an open position (unlocked) positions… instruments locked during autoclaving can experience cracked hinges (box locks) or other problems because of heat expansion…for instruments sets unlock all instruments and sterilize in the open position." Miltex Surgical Instruments – Care and Handling (2005).

When making an SOP for your facility, it should reflect your practice. To do this, consider the various OEM IFU and standards to make the SOP. If you are audited, then you are "walking your talk" on this subject. Here is some possible wording that might be used in an SOP based on the information I have shared.

- An example statement for sterilization of medical devices that have ratcheted or take apart IFU (See Figure 2).
- "all ratcheted medical devices will be in the open, not engaged position during sterilization either in the natural, relaxed position or with the aid of a product to ensure it stays in the open position during the sterilization process. Also, other medical devices per the IFU that must be disassembled during sterilization will be."

Figure 2

There are many companies that provide devices that help keep instruments in the proper position during the sterilization process. Work with them to make sure the products you use are clinically relevant and evidence-based for your process.

You want to get to best practice, and best practice is making sure all instruments that have a ratchet and instruments that need to be disassembled for sterilization are in the proper position so they can be properly sterilized, opened or disassembled. **HPN**

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1. https://is.gd/q92n6Q
2. https://patents.google.com/patent/US6635072

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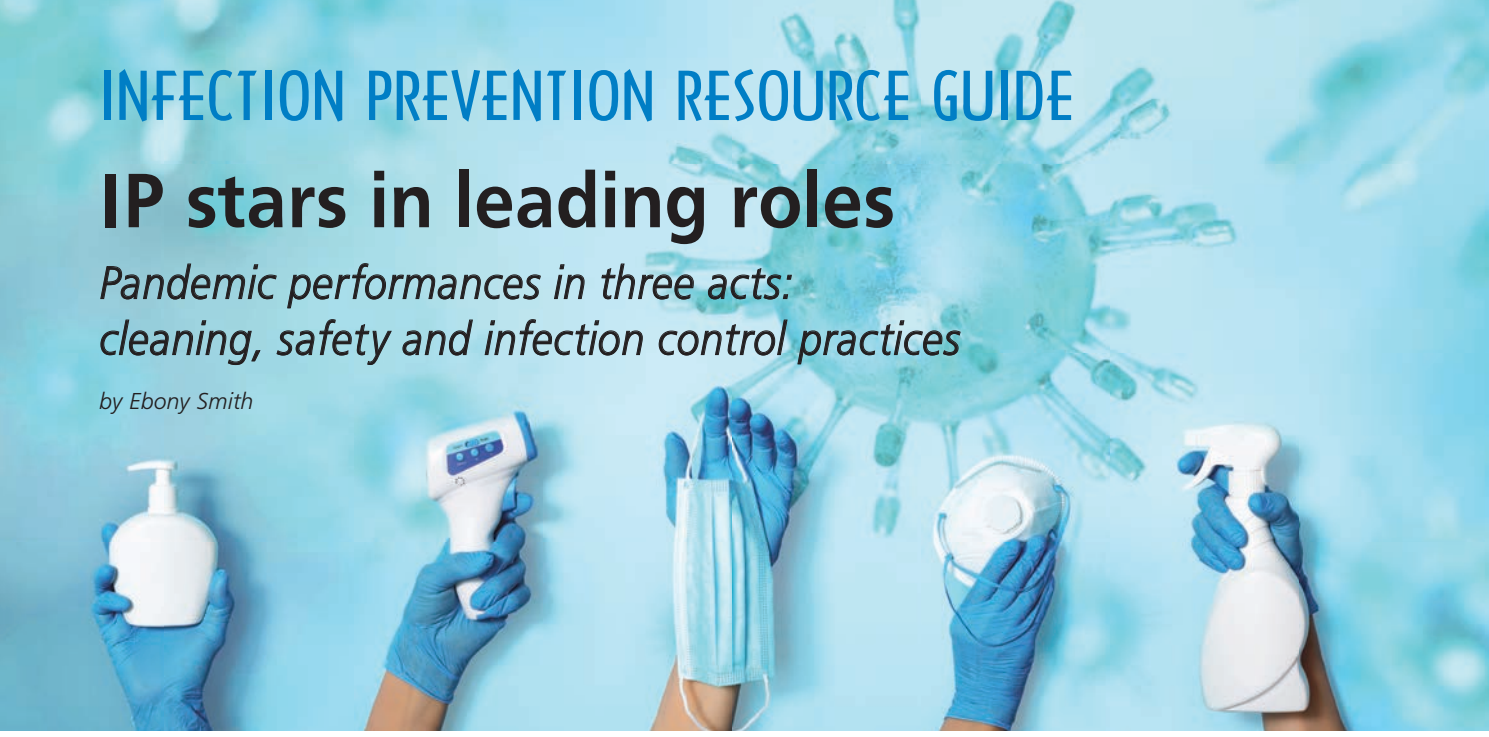
IP stars in leading roles

Pandemic performances in three acts: cleaning, safety and infection control practices

by Ebony Smith



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Infection prevention (IP) staff act every day in critical roles protecting patients, families and each other from pathogens and infections across hospital, patient room and other healthcare settings. As the second year of the COVID-19 pandemic plays on, prevention of the SARS-COV-2 virus and other community-spread or hospital-acquired infections (HAIs) remains center stage in care.

"HAIs are a major burden on healthcare costs in the U.S.," noted Shawn Malek, Sales and Marketing Manager, Far UV Technologies, Inc. "Per the Centers for Disease Control and Prevention (CDC), at least one in 25 patients in U.S. hospitals is dealing with an HAI on any given day. HAIs are more than just added costs; they can cause irreparable bodily harm, drive up the costs of healthcare and even result in death."

Preparedness and prevention of infectious diseases made ECRI's "Top 10 Patient Safety Concerns for 2021." "Of the 10 topics in the report, eight are related to or exacerbated by COVID-19. In addition to health disparities, others include emergency preparedness in aging care facilities, disease outbreak preparedness, supply chain shortages, telehealth, the improvised use of medical devices, and aerosol infection prevention. Each concern is coupled with strategic recommendations to avoid or counter it."[1]

Accountability, resources

Ultimately, who is responsible for safety and infection prevention in facilities during a public health crisis, such as COVID-19? Everyone plays a part, expresses Sharon Ward-Fore, Infection Prevention Advisor, Metrex.

"During the height of the pandemic it was 'all hands on deck,'" Ward-Fore observed. "Everyone was nervous about this virus because so much was unknown, so information was shared across departments regarding supplies, patient bed numbers, staffing shortages due to illness/quarantine and the latest news and developments. Most departments were working longer hours. All departments were attuned to the need to conserve and use supplies appropriately to be able to work safely. All departments were concerned about the impact of shortages on patient care."

Certainly, IP staff perform a major role in the support of hand hygiene and personal protective equipment (PPE) for environmental services (EVS), clinical and other staff. They also support clean and safe healthcare facilities for patients.

"With their expertise, IP teams and infection preventionists use data to guide strategies, policies, and procedures for EVS teams," stated Martin McGonagle, General Manager, SC Johnson Professional Healthcare. "IPs assess data through electronic hand hygiene monitoring systems, cleaning protocols in patient rooms and on equipment used on patients and confirm PPE is worn at the right times for all staff.

Infection preventionists, in particular, have spotlighted ongoing education on COVID-19 and protection, notes Karen Hoffmann, RN, MS, CIC, FAPIC, FSHEA, an infection preventionist consultant for the Vidashield UV24 from NUVO Surgical.

"Adding to oversight responsibilities of HAI prevention activities, IPs have always had to be ready to pivot to respond to outbreaks with added surveillance, rounding, education, data analysis and mandatory reporting," Hoffmann explained. "IPs have also played a leadership role in their facility in real time by investigating, evaluating and implementing mitigation and prevention strategies. For many facilities, the IP is the face and communicator of the pandemic response for their facility."

Clorox Professional Products Co.'s Doe Kley, RN, CIC, MPH, T-CHEST, Senior Infection Preventionist, points to flexibility of work schedules and supplies among EVS and IP.

Doe Kley

"EVS and IP teams have worked and continue to work grueling hours over the past year, with much of that time (and energy) focused on a single pathogen – SARS-CoV-2," Kley shared. "They have also had to ensure that appropriate PPE and disinfectants were available at all times. This sometimes meant using products unfamiliar to them or in formats they were not accustomed to using. If this past year has shown us anything, it's the importance of resilience – which is something that these teams embody everyday while keeping healthcare facilities safe."

As the crisis persists, PPE sourcing should remain a top priority, stresses Don Lowe, Spokesperson, ProTEC-USA.

"Procuring sufficient quantities of high-quality PPE is a matter that's paramount in protecting front-line workers in the healthcare field," Lowe indicated. "There have been numerous 'pop-up' PPE manufactur-

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ers, many of which are offshore, that fall well short of delivering a dependable PPE product on time. There is legislation under review at present that works to secure domestically produced PPE for maximum confidence and protection."

In play for PPE disinfection changes are new guidelines from the U.S. Food and Drug Administration (FDA) "recommending healthcare personnel and facilities transition away from crisis capacity conservation strategies, such as decontaminating or bioburden reducing disposable respirators for reuse. Based on the increased domestic supply of new respirators approved by the Centers for Disease Control and Prevention's (CDC) National Institute for Occupational Safety and Health (NIOSH) currently available to facilitate this transition, the FDA and CDC believe there is adequate supply of respirators to transition away from use of decontamination and bioburden reduction systems."[2]

Holding much knowledge in their field, infection preventionists can provide guidance on IP protocols and product evaluation in facilities, suggests Eric Jungslager, Vice President of Healthcare, GP PRO.

"While the IP has always been responsible for isolating the sources of healthcare-associated infections and limiting their spread, this guidance has heightened their attention to hand hygiene, be it establishing hand hygiene compliance metrics, educating healthcare workers on the importance of adhering to hand hygiene protocols or overseeing compliance," Jungslager emphasized. "In addition, the coronavirus pandemic has made the role of the IP much more visible and prominent, thereby driving their subject matter expertise to the forefront of facility operations and providing them with an opportunity to take a more active role in researching and selecting infection prevention solutions. By having a voice in this selection process, the IP is better poised to achieve a facility's stated infection prevention goals."

Following protocols, standards

Infection preventionists dedicate much of their time assessing, collecting and presenting information and data internally and externally, points out Anastasia (Stacy) Johnson, MSN, APRN, ACNS-BC, CNOR, CNS-CP(E), Clinical Education Consultant, Advanced Sterilization Products.

"During the constantly changing course of the COVID-19 global pandemic, IP teams have been called to partner with healthcare professionals to the full extent of their role: observe practices; educate healthcare teams; advise hospital leaders and other professionals; compile infection data; develop policies and procedures; and coordinate with local and national public health agencies (APIC, 2021),"[3] Johnson noted. "They continue to monitor reports from state and federal public health agencies to inform practice and update policies. The IP serves as a critical resource to review infection data and trends, and to consult and answer questions regarding COVID-19 testing, vaccination and new variants of the COVID-19 virus."

Anastasia Johnson

On the patient care side, respiratory professionals provide medical equipment that is sanitary and safe for use on patients, highlights Edwin Coombs, MA, RRT, NPS, ACCS, FAARC, Senior Marketing Director for Portfolio Solutions Training, Clinical

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Edwin Coombs

"Generally speaking, respiratory care practitioners are responsible for the safe and effective reprocessing of ventilators in the ICU between patients," Coombs said. "For the past year during COVID, special attention has been paid to ways in which this reprocessing can be streamlined while remaining safe and effective."

For patients in the hospital's care for longer periods of time, SARS-CoV-2, consequently, increases the risk of contraction of HAIs and, therefore, necessitates extra safety precautions, explains Kalvin Yu, M.D., FIDSA, Senior Medical Director, BD.

"A recent BMC study demonstrated that, of more than 140,000 patients tested, those with COVID had a higher rate of potential HAIs, showing that essentially SARS-CoV-2 was associated with higher rates of certain types of hospital-onset infections, greater antimicrobial usage and extended hospital and ICU length of stay,"[4] Yu indicated. "Additionally, resources normally diverted to education on how to properly manage PPE, including how to put on, use, store and remove (which has historically been an issue even before COVID), was highlighted this past year yet again, particularly given the high mortality rate."


Kalvin Yu

Examining HAIs prior to COVID-19, the National Human Genome Research Institute (NHGRI) reported that "researchers studied administrative data from 133,304 patients who stayed in National Health Service (NHS) hospitals in Oxfordshire, U.K. for at least 48 hours between 2011 and 2015…Using the data, the team could predict subsequent infection for bacterial and viral pathogens that commonly cause hospital-acquired infections: methicillin-resistant Staphylococcus aureus (MRSA), Escherichia coli, Pseudomonas aeruginosa, Clostridium difficile and norovirus. These pathogens are usually transmitted either through direct contact, contaminated surfaces or contaminated food and drinks.

"For all five pathogens, the researchers found that patients were most likely to be infected if they spent more than 24 hours in the presence of a potentially infected person…According to the study results, if healthcare workers had tested patients based on the duration of exposure to known or suspected cases, new cases could be caught up to a day before they actually were detected. The researchers believe that implementing such an approach will help prevent the spread of hospital-acquired infections and vastly reduce the cost burden."[5]

Instrument reprocessing has become another responsibility on the IP side, observes Theresa "Terri" Kunsman, Senior Product Manager for CDS (Cleaning, Disinfection, and Sterilization), Olympus America, Inc.

"Infection prevention managers have been taking a much more active role in understanding and following end-to-end endoscope reprocessing processes and re-evaluating protocols," Kunsman indicated. "This additional oversight and day-to-day management of processes have led to additional investments being made in reprocessing tools and technologies, as well as education and training programs."

Preparing for future roles

How can IP practices succeed and enhance patient safety in the future?


Peter Veloz

Peter Veloz, Chief Executive Officer, UltraViolet Devices, Inc. (UVDI), suggests, "Expandable infection prevention protocols that can be scaled rapidly in the event of patient

traffic surges can help ensure facilities are as prepared as possible for future challenges."

As part of planning, Jon Imms, Global Technical & Product Director, CleanSpace Technology, recommends focus on respiratory PPE.

"As part of an ongoing Pandemic Preparedness Program, there is a clear mandate for practices around the world to prioritize the improvement of policies, procedures and equipment for PPE," Imms stated. "While N95s have a place in the community and some clinical settings, in high-risk environments where airborne pathogens exist, such as in the COVID-19 and Ebola outbreaks, staff need to be using Powered Air Purifying Respirators (PAPRs)."

Peg Fox-Giacomuzzi, MSN, BSN, RN, National Director of Surgical Services, Standard Textile, proposes relationship building within the medical industry and development of sustainable products.

"IP professionals need to be in close contact with infectious disease physicians and epidemiologists in order to stay current on what seems to be daily changes to CDC guidelines, as we continue to learn more about the COVID-19 virus," expressed Fox-Giacomuzzi. "Looking ahead at new strategies to advance infection control and patient care, IP professionals should also advocate for increased research on sustainable practices. All relevant stakeholders (frontline staff, linen services, vendors and IP) play a role in also understanding the value of creating a safe, sustainable culture in healthcare, and reusable textile solutions are an important part of that conversation."

Sarah Simmons, DrPH CIC FAPIC, Senior Director of Science, Xenex Disinfection Services, advocates for team collaboration, adhering to the latest disinfection standards and openness to new technology.

"The COVID-19 pandemic has served to underscore the importance of teamwork between the EVS and IP teams," Simmons noted. "The challenges of emerging infectious diseases will continue, and the slow but steady emergence of multi-drug resistant and pan-drug resistant bacteria will only increase in the coming years. Assuring a gold standard of environmental disinfection will be a key part of stopping the spread of these organisms. IPs and EVS Directors need to make sure they keep abreast of the newest and most effective technologies for enhanced disinfection."

In terms of education, the American Hospital Association announced earlier this year that it "received two grant awards totaling $6 million from the Centers for Disease Control and Prevention (CDC) to advance public health and infectious disease prevention initiatives,"[6] including a "grant for $4 million," which "will support collaboration between the AHA, CDC and community colleges through Project Firstline, CDC's national training collaborative for infection prevention and control… Through this initiative, current and future generations can start their careers with a more solid understanding of infection control. The initiative will also promote connections between hospitals, learning institutions and other parts of the health care system."

Sharing observance and guidance with one another is another good practice, adds Metrex' Ward-Fore.

"Teams can continue to collaborate with each other and share their knowledge and what they see happening on the floor – good or bad," she said. "We can encourage others to speak up – if you see something that doesn't feel right – say something. We can all help others see the importance of basic infection control by setting the good example." **HPN**

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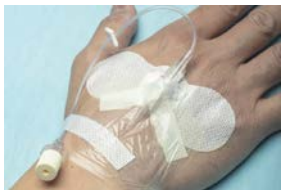

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1. Zorzuela, Samantha. Rutton-Sims, Nicole. Nagataklya, Lisa. DeMachant, Kevin. Defining Standardization in Helathcare: Mohawk Shore Services. 2013.

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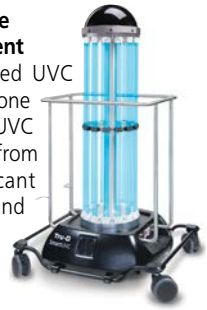

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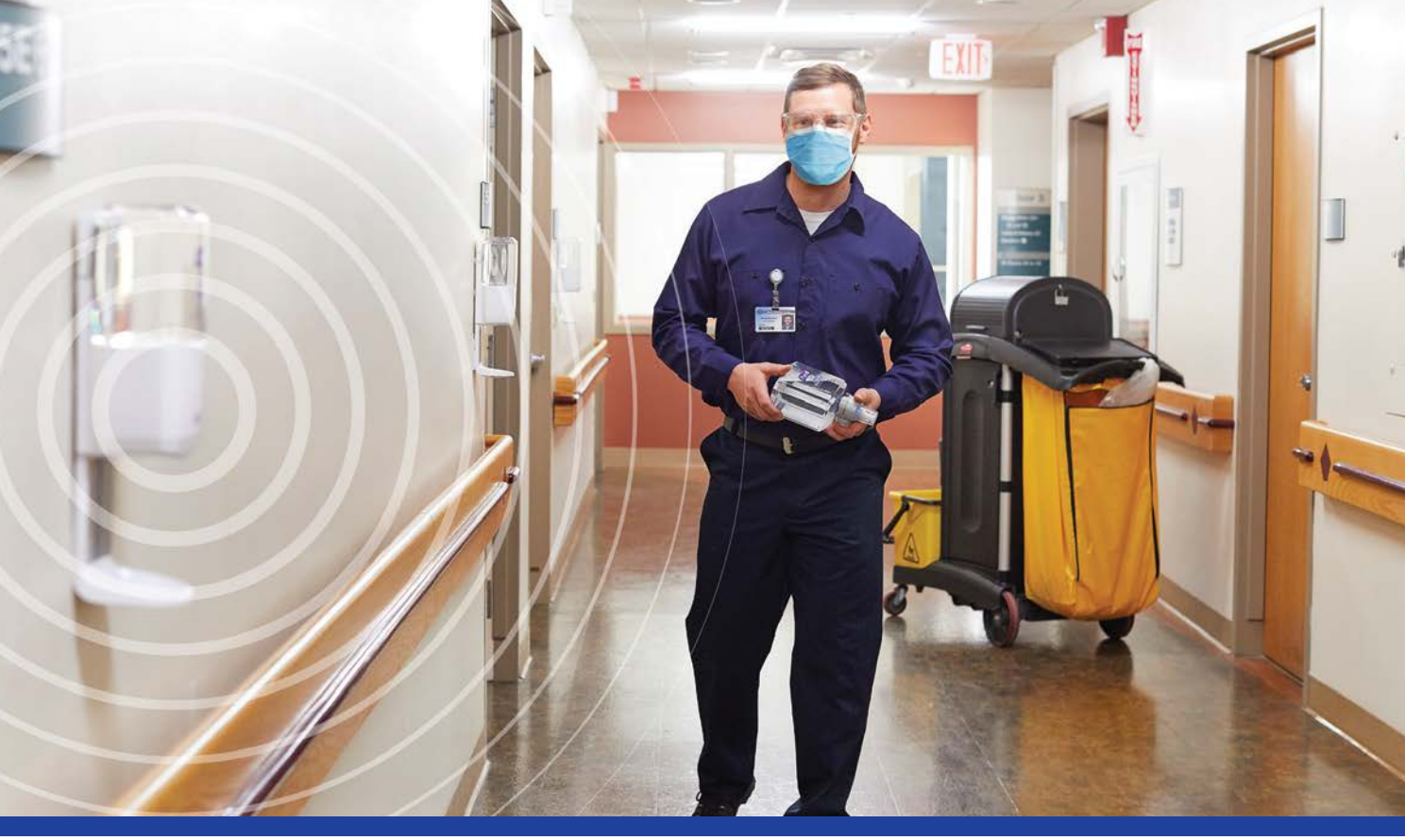

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1. KCP Onvation Study, 2017.

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SUPPLY CHAIN COMPENSATION SURVEY

Earnings growth outpaces pandemic pressure again

by Rick Dana Barlow

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Much like barely scooting your Ford Model T ahead of the billowing 10-foot-high cloud chasing you at 65 miles per hour southeast across the Oklahoma plains during the Dust Bowl of the early 1930s, compensation levels for supply chain professionals continue to inch up in front of the ongoing pandemic aftershocks.

Some 16 months into the COVID-19 pandemic that dominated 2020 and threatens to push deeper into 2021 and residually linger into 2022, supply chain pros remain inexorably linked to the multiyear crisis. Yet even though unexpected demand spikes for hygienic and personal protective equipment (PPE) and logistics issues surrounding vaccine development and distribution, among other concerns, illuminated the supply chain's startling fragility, supply chain pros can heave a soft sigh of mild relief as the criticisms and doubts experienced during 2020 didn't permanently damage the infrastructure so much as light a fuse for change.

While pandemic-related compensation effects may not truly be realized until 2022 or 2023, particularly if little-to-no improvements are instituted from the analysis of the COVID-19 response, the results of *Healthcare Purchasing News*' 2021 Supply Chain Compensation Survey once again offer some welcoming takeaways.

For the second consecutive year, the average salary for a Director/Manager of Materials Management/Supply Chain surpassed the six-figure ceiling, according to the survey. Department leaders reported an average annual salary of $105,693, a 4.5% gain above 2020's average of $101,174, which was itself a larger 7.5% increase over 2019's statistic. Yes, the growth may be leaner and slower but nonetheless significant.

Meanwhile, Value Analysis Directors/Managers/Coordinators joined the "six-digit club" for the first time, the *HPN* survey showed. Value Analysis leaders reported an average annual salary of $102,395, a 14.4% jump from the prior year. The question remains: Does that reflect an amplification of value analysis' importance during times of crisis or merely an indication of differing respondent pools?

More sobering: Of the seven titles *HPN* routinely surveys every year, only three reported year-over-year salary increases. Purchasing Directors/Managers represent the third title that recorded a rise in salary to $74,659, a more modest 3.9% increase above $71,875 listed in 2020, but still well above the level of inflation. See the chart below for the tally.

Although not illustrated this year, the overall supply chain management compensation composite index (CCI), something of an unscientific salary stew of results derived by the average aggregate salary of all survey respondents) reached an all-time high this year at perhaps one of the industry's lowest points (courtesy of the pandemic fallout). In fact, since 2005, *HPN* has recorded 10 CCI increases. Conservatively, if the momentum continues, the CCI should poke through the six-digit milestone within two to three years. This element, while more trivial than statistically significant, measures more of a subjective impression of attitude and direction.

As a continuing customary cautionary caveat, *HPN* advises readers that survey data and trending perspectives hinge on a variety of demographic elements that include the number and mix of respondents by job title, facility type and location and gender. For example, more senior-level executives who lead centralized integrated delivery network (IDN) operations generally will elevate salary data, while more buyers at community hospitals may push the salary data lower.

Once again *HPN* monitors five key trending areas, many of which are illustrated in the charts and graphs within this annual feature.

Let's start with prominence and proximity.

Pandemic punctuation

For the second year in a row, the average annual salary for Supply Chain leaders at

SALARY BY TITLE AND GENDER

	2020	2021	2021-FEMALE	2021-MALE
Director/Manager, Materials/Supply Chain Management	$101,174	$105,693	$91,096	$115,450
Purchasing Director/Manager	$71,875	$74,659	$63,199	$90,588
Senior Buyer/Buyer/Purchasing Agent	$52,500	$50,592	$45,999	$62,000
Executive/Senior/Corporate VP, Materials/Supply Chain Management/Support Services	$206,000	$182,794	$123,750	$197,708
Value Analysis Director/Manager/Coordinator	$89,500	$102,395	$103,947	$90,833
O.R. Materials Manager/Business Manager	$70,938	$66,500	$59,423	$79,642
COO/Chief Purchasing Supply Chain Officer	$239,500	$209,583	$57,500	$240,000
Administrator/President/CEO	N/A	$185,000	N/A	$185,000

*3.7% of survey responders opted not to share their gender, but are include in the salary summaries.

the director/manager level exceeded the $100,000 threshold. Granted, this can be attributed in part to cost-of-living concerns and the geographic location and organization type of the respondent. At the same time, the survey found the average annual salary for Value Analysis leaders poked through the $100,000 level for the first time.

Further, more than 61% of respondents said their 2021 salary increased from the prior year – the average being a 3.2% rise – and most respondents (88%, the survey showed) attributed the increase to job performance alone. More than 95% feel rather secure in their positions (51.5% "very secure" and 44.1% "somewhat secure").

These data seem to indicate a need for and value of the supply chain and value analysis functions during a time of crisis and heightened demand for products and services.

Several supply chain leaders agree.

"There is no doubt in my mind that the pandemic highlighted both the fragility and the importance of the global healthcare supply chain," Shaun Clinton, CMRP, Senior Vice President, Supply Chain Management, Texas Health Resources, Arlington, TX, told *HPN*. "I think we will continue to see a trend where salaries will continue to rise – probably not quickly enough – as organizations look to attract top talent in roles now seen as critical to business continuity. It maybe didn't feel like it every day in 2020, but it really is a great time to be in supply chain!"

Brian Dolan, CMRP, CRCST, LSSGB, Vice President, Resource Management, Bayhealth Medical Center Inc., Dover, DE, remains equally as sanguine.

"The profession will continue to see growth in compensation as the value of the supply chain is continuing to be boosted by new needs in the organization," Dolan noted. "As the supply chain is seen to be more a strategic asset, and closer ties are illustrated to the IHI quadruple aim, we will see these roles demand higher education, certification, and expertise – thus, compensation increases. The pandemic was a catalyst for some organizations that did not know the value proposition. Still, many were already down the path towards advancing the supply chain to the C-suite. The return on investment and return on quality are significant drivers. As our profession becomes more vocal and assists their hospital administration in seeing the value proposition, we will continue to see escalations in the compensation models used today. Our profession's identity is still forming and needs continued focus and standardization in practices to solidify our stance nationally."

Dolan's organization earned *HPN*'s 2021 SPD Department of the Year last month.

Value Analysis Evangelist Barbara Strain, CVAHP, Principal, Barbara Strain Consulting LLC, Charlottesville, VA, urges supply chain leaders and pros into action – even amid the pandemic.

"On a personal as well as professional/organizational level, seize the moment created by the pandemic," Strain said. "Who or what department stepped up, how were problems solved, were new collaborations made, were processes improved? The list is long. For the past year healthcare influencers have been saying, 'don't let a good pandemic go to waste.' Next to clinicians and physicians, Supply Chain, Value Analysis, Purchasing and Contracting have been like the duck holding their head high while their feet are paddling madly to get to where they need to go. New department structures, roles and salaries should be top of mind."

Still, Mary Starr, Vice President, Member Care, Greenhealth Exchange, who has experience as a hospital supply chain executive and a group purchasing organization (GPO) executive, questions the singularity of something like the pandemic affecting compensation levels, and in turn, points to a duality.

"There likely isn't a single factor causing either the average salary gains or the feeling of job security," Starr indicated. "But I think two major factors impacting salary are consolidation and a higher profile/value recognition for the supply chain leadership position. The industry recognizes that real cost savings is not about getting a few pennies off of your gadgets, but instead working with clinicians to calculate costs and quality that are measured by improved outcomes. This approach entails a high skill set, and therefore, requires a higher salary. I also think the same is true for a value analysis position. But I would add that in the future, value analysis will be the area that really stretches skill sets when components such as environmental, social and community impacts are elevated in importance and become more integrated into hospital performance measures."

Hospital type, general location

Data consistently show that the higher-compensated Supply Chain executives and professionals seem to entrench themselves at larger urban not-for-profit hospitals on either coast, followed by suburban not-for-profit hospitals and then investor-owned facilities with government facilities inserted for good measure. (See the charts and graphs on "SALARY BY REGION" on page 56.) Some of that may be due to for-profit hospitals comprising a small percentage of the overall hospital market. But surely the pandemic plays a role?

Experts remain mixed.

"The larger centers make a more significant investment in the supply chain as its value proposition is more apparent to executives," said Bayhealth's Dolan. "Their size allows for the scale of the roles to dictate higher compensation levels. A strong supply chain equally benefits all entities. Still, it appears in the market that larger urban organizations focus more on the supply chain.

"With the shift in focus to nonacute [and] telehealth, the supply chain will focus on more robust distribution networks and tighter controls," Dolan continued. "This will evolve the necessary expertise for the supply chain professional to think about the continuum of care versus solely [within] the hospital walls. This was always present, but COVID did reflect an increased need to develop critical competencies in these areas. I do not think it will affect the compensation level but will create different roles [with] more focus on procurement/sourcing and distribution/planning."

Strain acknowledges that generally, the location of the job influences salary more than any other reason. But not always.

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SALARY BY TITLE AND EDUCATION

	High School	Associate's	Bachelor's	Post-Graduate
Director/Manager, Materials/Supply Chain Management	$80,208	$80,416	$104,901	$131,439
Purchasing Director/Manager	$53,194	$80,000	$83,750	$126,875
Senior Buyer/Buyer/Purchasing Agent	$42,368	$51,785	$60,227	$92,500
Executive/Senior/Corporate VP, Materials/Supply Chain Management/Support Services	N/A	N/A	$162,916	$193,636
Value Analysis Director/Manager/Coordinator	$65,833	$57,500	$117,500	$107,666
O.R. Materials Manager/Business Manager	$48,125	$74,642	$85,000	$82,500
COO/Chief Purchasing Supply Chain Officer	$240,000	$57,500	N/A	$240,000
Administrator/President/CEO	N/A	N/A	N/A	$185,000

SUPPLY CHAIN COMPENSATION SURVEY

"You may move to a different state or region to become Chief of Supply Chain while earning less with résumé/career building in mind or you want a different personal lifestyle experience versus professional job hopping in a more affordable market," she reasoned. "This has more to do [with] where the care is or transitioning to than where the job is.

"I did not think I would be using the 'double-edged sword comment,' but here it is," Strain continued. "On one hand a shift to non-acute care and telehealth may mean those with the expertise and infrastructure will succeed, which may not be what supply chain is typically known for. On the other hand, this is an opportune time to be the disruptor in your area as a business strategy. This requires the right leader, in the right place, with the right team – new positions, new titles, new skills, which lead to salary reviews."

Greenhealth's Starr offers something of a horizontal rationale bisecting a vertical one.

"Generally speaking, for most sectors – not just healthcare – organizations located in an urban setting have higher pay scales," she surmised. "Additionally, the larger hospitals with more complex supply chains are typically located in urban areas. Therefore, I think it's a combination of the challenge and the location that attract high performers. And the results of both location and skill set required result in the higher salary averages for these locations.

"As for the for-profit hospital systems," she continued, "most of these organizations have more centralized supply chains. As a result, the higher-skilled – and therefore, higher-salaried – positions are working at the corporate level with the individual locations having supply chain professionals that execute on the overarching strategy."

Education, training, certification

Not surprisingly, the higher education attained – including degrees, certificates, skills and strategic thinking – seems to propel the income trajectory. In many cases, experts concur, but it requires patience more than patients.

"I had someone tell me once that the reason why they liked to see someone with a graduate degree apply for a role is that they probably had the discipline that comes with the rigors of education," observed Texas Health Resources' Clinton. "I tend to agree with that. And now that Supply Chain programs abound in many universities, there should be encouragement from those of us that have been doing this for a while to the next generation. Certification is important — but it really needs to be in conjunction with a well-rounded education plan. Experience is a great teacher, but it can be a really slow one!"

Starr wonders whether high performers already represent those who seek additional education and certification.

"Education and certifications can certainly enhance one's ability to perform in a position, but those alone are no guarantee of a better position or salary," she said. "I think the same salary/position drivers in other industries can be applied here. You need the education or certification to gain the technical or management knowledge, but the ability to measure information and make decisions to move work forward, anticipate and mitigate risk, as well as strong communication and work ethic are critical for success regardless of education."

Much depends on the organization itself, according to Dolan.

"The organization can set the tone for education," he noted. "Some organizations do not consider education level in the compensation model unless required for the role. For example, suppose an organization hires an individual with a doctorate into a role that requires a bachelor's degree. In that case, the compensation level is not immediately impacted by their higher degree.

"Education/certification should factor in as an example of an individual's dedication to professional growth," Dolan said. "The organization should develop detailed career progression models that tie advancement to these factors and experience, involvement in initiatives, etc. Certification is a specific example of this as it demonstrates value and commitment for the organization. These must be detailed in a well-constructed career model tied to the organization's objectives."

Strain expresses caution about reading too much into the data, however.

"Overall, job descriptions for the types of roles for middle management positions collected by the survey may state 'must have' an associate degree to apply with a 'prefer' bachelor's or higher degree," she said. "If the position has historically been filled with associate-degreed individuals the salary may remain organically lower and influenced by other factors – geography, salary ranges, titles."

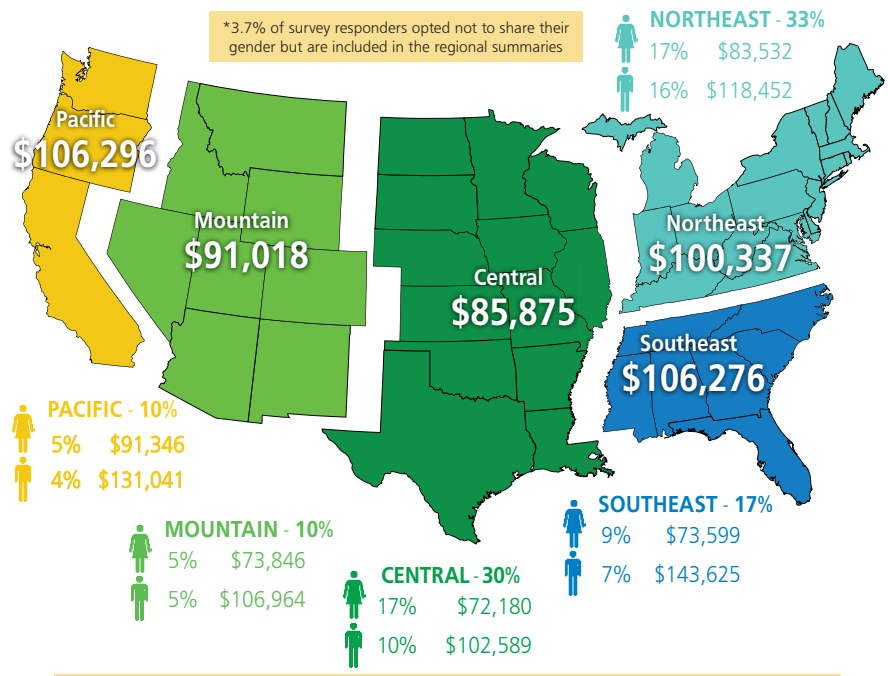
Training and/or certification also vary by type of role, Strain insists.

"Based on personal experience, certain roles require training beyond a degree – laboratory, pharmacy, radiology, physicians, to name a few," she said. "In turn, some positions require that individuals hold a certification [that] can be accomplished either by taking a prescribed set of curricula or passing a certification exam from a recognized professional organization or federal/state/

Non-profit	$100,272
For-profit	$81,590
Government-owned	$92,125
None of the above	$108,750

URBAN	SUBURBAN	RURAL
$116,250	$102,500	$74,010

SALARY BY REGION



Charts above display the average composite salary across ALL TITLES broken out by the factors indicated.

county other program. Do job descriptions in Supply Chain, Value Analysis, Purchasing say 'prefer' or 'must have,' and do those with CMRP, CVAHP and other designations get the job and/or earn more?

"A Supply Chain trend that started as a groundswell in the mid-2000s was a deliberate hiring of individuals from outside healthcare who have advanced degrees/training/certifications in Process Improvement, Project Management, Analytics, LEAN/Six Sigma, to elevate how Supply Chain can remove waste and quickly contribute to improving the delivery of care," she reflected. "These hires come with a salary to assure they stay long enough to affect your business strategy."

Age, experience, longevity

Logic states that the more experience you gain over time (think age now) and the longer you remain with an organization, the more dollars, influence, perks and power you can earn. Yet, some seem to achieve similar outcomes by hopping around facilities in one segment (provider) or even multiple segments (GPO, supplier).

The consensus? No sure thing either way.

"My experience is that moving periodically is the trigger to higher salary gains," Starr indicated. "It is unfortunate that strong employees are not rewarded as highly for staying at an organization as they are for moving to another. I think much of this situation is caused by budget or human resource policies related to annual increases. On the other hand, changing jobs too frequently will impact your reputation, and doesn't allow an individual to demonstrate that they can make big, strategic changes [that] have a lasting impact on an organization's success."

Dolan agrees somewhat.

"Salary and compensation tend to increase when you transition roles," he acknowledged. "Most organizations adopt a standard promotional rate for internal team members. These rates can be significantly lower than those moving to different employers. You can see an offer that is substantially higher depending on the applicant's role. There may be some variations in internal equity that play into the salary point. Employers want to ensure that hiring someone into a role does not go over a particular percentile within the pay scale, so an applicant does not max out too quickly for compensation.

From a team and organizational standpoint, I would instead incentivize stability and longevity as with transitioning of leaders comes the counter to stable and productive environments," Dolan countered. "Teams feel it with changing leadership direction. The organization feels it with a shifting tone of the department's service. A professional may seek alternative employment if their current organization is either not prepared for the role they want (i.e., chief supply chain officer) or held tightly to the compensation manual."

Clinton, on the other hand, flips the sentiment.

"Personally, I've been fortunate enough to be able to get promoted without having to move around," he chimed. "Which is how I like it. There is a lot to be said for staying put, embracing the hard tasks, and taking a long-term view of your career. Granted, no one should ever have to remain in an untenable situation, but the ability to learn the culture of a place is not something you can do quickly."

Strain looks at it from economic and human resource perspectives.

"Through personal experience, there is a disadvantage to longevity at one organization either after a certain number of years or when there are economic changes overall, e.g., late 1970s or the 2007-2009 era when recession affected markets," she explained. "If it is the former reason, when new hires are made into similar roles the salary is commensurately higher. Those who have been in an organization longer can sour the environment, talk behind their back to others or may force them to leave so they can have another go at a salary/title bump.

"Reasons again can be economics," she continued. "Pay range changes that may not affect incumbents, or the new hire's salary at their previous place of employment may not be matched, and they settle at a lower value because of the role itself. Also, the education/training/certification qualifications may be equal but the total number of years of experience may account for salary differences within a pay range."

Strain points to HR policies that can exert pressures on the hiring and compensation process through role and salary assessments they perform based on four factors:

- time frames that fit their organization, state, or federal established schedules
- when there appears to be a disparity in those filling a role
- a new role is required
- a case-by-case basis when asked by a department or service-line management.

"These surveys are customarily performed by geographic region by role type based on the marketplace in which these positions occur, e.g., healthcare," she continued. "This factor is important when establishing your department organization structure, the roles that will fill out the positions and most importantly what title you give these roles. Employees may feel a vote of confidence and importance by their new title, but if HR cannot find a role match when performing the human resource assessment and can only slot in a close match, you and the employee may be caught in a salary vortex. This could be another pain point that may be influencing the *HPN* Salary Survey." **HPN**

Visit hpnonline.com/21222439 for additional charts and expanded coverage.

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SALARY BY REGION, TITLE & GENDER	MALE		FEMALE	
PACIFIC	**2021**	**2020**	**2021**	**2020**
Director/Manager, Materials/Supply Chain Management	$160,937	$140,625	$126,250	$67,500
Purchasing Director/Manager	$90,000	$117,500	$75,000	N/A
Senior Buyer/Buyer/Purchasing Agent	$37,500	$52,500	$52,500	$56,250
MOUNTAIN	**2021**	**2020**	**2021**	**2020**
Director/Manager, Materials/ Supply Chain Management	$109,000	$96,250	$86,875	$78,750
Purchasing Director/Manager	$65,000	$82,500	$24,999	$52,500
Senior Buyer/Buyer/Purchasing Agent	N/A	$62,500	$52,500	$52,500
CENTRAL	**2021**	**2020**	**2021**	**2020**
Director/Manager, Materials/ Supply Chain Management	$94,062	$90,500	$94,500	$93,929
Purchasing Director/Manager	$58,333	$70,000	$89,166	$45,357
Senior Buyer/Buyer/Purchasing Agent	$62,500	$52,500	$36,666	$52,500
NORTHEAST	**2021**	**2020**	**2021**	**2020**
Director/Manager, Materials/ Supply Chain Management	$121,944	$111,471	$82,833	$90,500
Purchasing Director/Manager	$96,666	$64,167	$73,500	$80,000
Senior Buyer/Buyer/Purchasing Agent	$66,500	N/A	$51,388	$52,500
SOUTHEAST	**2021**	**2020**	**2021**	**2020**
Director/Manager, Materials/ Supply Chain Management	$107,222	$115,000	$86,000	$72,500
Purchasing Director/Manager	$92,500	$97,500	$62,500	$90,000
Senior Buyer/Buyer/Purchasing Agent	N/A	$54,167	$40,999	$44,167

How can supply chain meet the demand for health equity?

by Karen Conway, Vice President, Healthcare Value, GHX

The COVID-19 pandemic heightened the world's awareness of the strategic importance of the healthcare supply chain, perhaps more than any other event in history. Now, as hospital shelves fill back up with necessary supplies, and America approaches herd immunity, supply chain has another opportunity to help address one of healthcare's most challenging issues: Health Equity.

Later this month, I have the privilege of chairing a supply chain-focused panel at a virtual national conference on Health Equity (healthequitysummit.com). The free event is made possible through the generous support of the Commonwealth Fund. In preparation for the conference, I wanted to share some initial ideas on supply chain's role, but first let's consider the root causes and the implications for our healthcare system and society at large.

The concept of health equity originated in the mid-19th century, when social medicine scholars recognized that "social and class inequalities led to inequities in health." Today, a growing body of research has linked systemic racism to higher incidence and severity of COVID-19 among the poor, which are disproportionately people of color. Many of these individuals were deemed essential workers with jobs that increased their chances of contracting the disease. Inequities in access to a range of social and economic benefits - employment, housing and nutritious food, etc. - have also been tied to a higher prevalence of chronic diseases (e.g., hypertension, obesity and diabetes) that increase the acuity of COVID-19 among communities of color.

Beyond the devastating impacts on individuals and families, health inequities also threaten hospitals. "Safety net hospitals have probably been the most hard hit, given their high proportions of indigent and socially vulnerable patients…[and their] disproportionate share of COVID-19 admissions," stated economist Gail Wilensky, Ph.D., the first chair of the Medicare Payment Advisory Commission (MPAC) and the former administrator of the Health Care Financing Administration (HCFA), the forerunner to the Centers for Medicare and Medicaid Services (CMS).

But caring for the poor does not have to be bad for business. For example, during the pandemic, primary care providers that cared for high-risk patients under a capitated revenue model did much better financially than those operating under fee-for-service. Practices that rely on volume saw their revenues decline sharply as patients deferred care, while those under capitated models continued to receive revenue in the form of "per member per month" payments. The stark contrast has revived discussions about the value of capitation for hospitals.

But what does this have to do with supply chain?

Social determinants of health (SDOH)

We've already seen supply chain become more involved in SDOH. Geisinger's supply chain played a key role in the success of the health system's Fresh Food Farmacy, by helping contract for and stock nutritious food for patients with Type II diabetes. Other hospitals are leveraging supply chain skill sets to support access to critical social needs, including affordable housing and transportation.

Supplier diversity

Helping support diverse (women, minority and veteran-owned) businesses is often the first (and sometimes only) linkage many make between supply chain and health equity. That's certainly true, but the full value is often underestimated. Money spent with local, diverse suppliers and local community businesses can have a ripple effect, multiplying the economic impact through additional spending in the community by those businesses and their employees.

Domestic manufacturing

As hospitals seek more domestic manufacturers to reduce dependency on foreign made goods, even greater benefits can be realized if hospitals help support investments in manufacturing capacity in minority communities. Not only can they increase supply reliability, they are also helping create new manufacturing jobs that often have one of the highest multiplier effects.

Training and development

With the creation of new jobs comes the need for training and career development. Hospitals are playing a role here, too. For example, in Chicago, hospitals serving disadvantaged communities on the city's West Side joined together to create a shared laundry and hire local residents, while training others to fill much needed medical assistants' positions. Hospitals, including supply chain departments, are also working to hire and create career pathways for women and minorities, in part to help reflect and better serve their communities.

Operational foresight

As healthcare is increasingly delivered outside the hospital, supply chains are expanding their logistical footprints. This takes on greater significance as healthcare systems seek to identify and better serve vulnerable populations, which is not only the right thing to do but will be critical as hospitals take on more risk, including capitation. Some public health organizations are using SDOH data and other community-based information to support the allocation and delivery of critical resources to disadvantaged communities.

Now consider the possibilities that advanced analytics brings to the equation. We are already benefiting from artificial intelligence (AI) and machine learning to understand which products work best on which types of patient populations and to predict their future health needs. Supply chains could leverage this data to work with clinicians to both source and improve access to the products and services most needed by the poor and communities of color.

These are just a few possibilities to explore, and I suspect there are many more, if we view supply chain through a broader lens. Think beyond supply chain's primary

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focus today - sourcing, contracting, storing and delivering clinical products used in hospital care. As the pandemic has taught us, health status depends more on what happens outside the hospital. Just as supply chain professionals collaborate today with clinicians to identify the best products to use in clinical care, so, too, can supply chain work with public health experts and community resources to optimize population health and minimize health disparities. For many, the pandemic was healthcare supply chain's moment. To me, supply chain is just getting started. **HPN**

Karen Conway works to advance the role of the supply chain as a critical enabler in the pursuit of a value-based healthcare system. As Vice President, Healthcare Value for Global Healthcare Exchange (GHX), Conway explores how the supply chain and improved data quality and visibility can support understanding of what increases value for patients and to those organizations that develop and deliver healthcare products and services.

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Previewing Supply Chain life beyond COVID-19

First of two parts

by Eric Jurinic

Throughout the course of the global COVID-19 pandemic, I have had a considerable amount of time to reflect about my life. Whether it be professional or personal, I have always strived to better myself.

I also find myself analyzing a lot! Professionally, I analyze things like my last Zoom call or WebEx meeting, how I am performing at the task at hand, and preparing future goals for success. Personally, I analyze my mental health by appropriately balancing work, family, friends, fun, and self-care to make sure I am the best husband, father, employee and person I can be. In analyzing this pandemic, I have found an interesting correlation to past pandemics, wars, economic depressions and recessions, etc. The result? Comfort zones! Many people, past or present, were pulled from their comfort zones to a point that was unimaginable.

Before COVID-19 emerged in early 2020, I felt a new project at work was pushing my comfort zone. As a healthcare Supply Chain professional, I have gathered a few things reflecting on the last 15 months and where we are today. I feel in healthcare, we are struggling to keep up with increasing headwinds, the Protecting Access to Medicare Act of 2014 (PAMA) impacting the clinical lab. Additionally, healthcare has seen the highest increase in costs at 200-plus% versus 66% inflation in other industries during the last 20 years, but costs are going up and we cannot get a reliable supply of products critical for patient care. To top it all off, global demand for personal protective equipment (PPE) is higher than I have ever seen. We strive to better ourselves, so why not apply the same principles to work processes? The short answer is, when we learn and take matters into our own hands, we will survive and thrive!

Having been in various professional Supply Chain roles of increasing responsibility inside and outside of healthcare for the past 17 years and being a son and grandson of Supply Chain professionals with careers in Logistics and Procurement, I would say supply chain is in my blood and I love it. I recall my first job was when I was five. My grandpa Steve gave me the responsibility of procuring worms for a fishing trip. These were not just any worms, but "free range" worms. One dollar per dozen was my pay! My grandpa was a strong believer in free range before it was a thing. He said they caught more fish! He did not rely on anyone else; he learned this growing up during the Depression. He always said, "Back when I was your age, if you wanted to eat you couldn't just fish, you'd have to catch." So, we went out the next day and we caught. This not only provided dinner for us that night but also his words of wisdom stuck with me.

What is the point about worms and catching fish and how is this analogous to the world of supply chain? To me it is taking control of our destiny with a more hands-on approach to sourcing items we need will drive better both quantitative and qualitative results. The fundamental issue in healthcare is that we seem to be caught in cruise control, which is causing complacency, which leads us to be taken advantage of, and the inevitable outcome is rising prices and concerns about supply access and availability. We have been trained to rely on suppliers who have gotten complacent while enjoying the fruits of rising pricing, and group purchasing organizations (GPOs) that are incentivized by pricing and compliance.

Unfortunately, complacency stifles competition and innovation. Anyone who has studied Economics 101 knows the direct result of limited competition is rising pricing and stagnation.

While I have enjoyed increasing roles of responsibility in my Supply Chain career, my experience in healthcare has only been since 2012. I was talking to some veterans in the industry, discussing PPE shortages, and I was intrigued that they said they were nothing new. They gave examples of AIDS, H1N1, Ebola and now COVID-19 as all sharing the same shortage problem for items like PPE, swabs, tubes, etc.

Several questions came to my mind on why this would be. Why is healthcare not learning from past mistakes on such critical items, as other industries would? Why are they not rolling up their sleeves, putting on their proverbial muck boots and finding their worms?

In my experience, I see that other industries have supply chains that are much more mature because they do a better job of managing risk. Healthcare seems to rely on someone else to fix their problems, whether that be the GPO, distributor, or direct supplier, and affix bandages on an issue until it passes. The bandage approach is precisely why the prospect of future shortages isn't an "if" proposition, but a resounding "when."

Next month, I will share 10 points to help you plan for a post-pandemic – and resilient – supply chain. HPN

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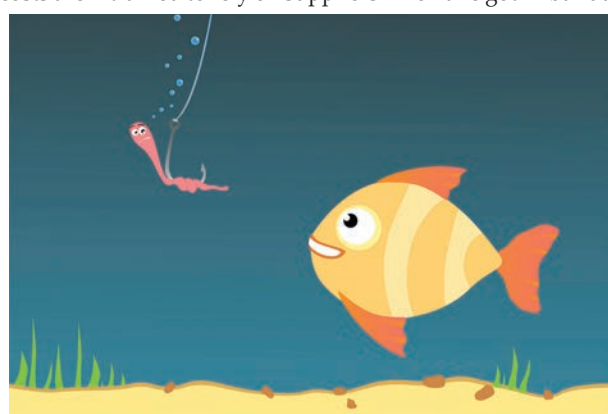

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