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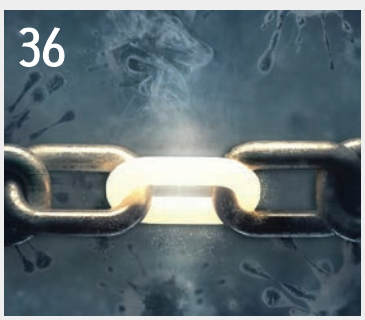



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# The New Nominal

When NASA – or more recently NASA in conjunction with Elon Musk's Space X Corp. – launches a rocket, the communication between the astronauts and those in Mission Control repetitively include an interesting response to questions about how systems are faring, how the humans are feeling.

Instead of responding that systems or the astronauts are faring or feeling "normal," they respond – if applicable – that they are faring or feeling "nominal."

What's the difference?

When something is "normal" it is something for which we are used to experiencing. We have become accustomed to it to the point that we take it – whatever "it" is – for granted. A good example? When there are no supply shortages, administrators and clinicians tend to ignore Supply Chain. It's only when things go wrong that suddenly lends credence and interest in Supply Chain.

In terms of aerospace engineering and spacecraft technology, the term "normal" cannot really apply because the persons involved aren't really used to experiencing what's about to happen. They may have precedence – like attorneys and judges using prior cases, laws and verdicts to adjudicate current and future legal opinions – in the form of prior launches and technologies. But therein lies the problem. As we move forward chronologically, the progress of technology and its useful applications tend to improve – typically at a faster pace.

As a result, researchers and scientists derive various scenarios that provide something of a baseline, a set of boundaries within them an action takes place. Hence, if a rocket launches from the pad in the "proper" trajectory to escape Earth's atmosphere and gravitational pull, it is performing "nominally" or within those anticipated, expected, even acceptable limits.

This scenario is not unlike crisis/disaster planning – particularly in the case of supply chain during a pandemic.

## Hallowed heroes, hollowed shelves

You've heard the phrase about healthcare that the one constant within healthcare is change. Well, that phrase is anathema to the context of constant. If something is constant, it's experienced regularly, routinely, and therefore expected to happen. If something changes regularly, routinely, then it's not really constant. However, something that changes so frequently might be "managed" more than "controlled" – think Forrest Gump playing ping-pong in his eponymous film versus the ping-pong ball remaining in its stationary packaging. A plastic ball in a box may be "normal," but a plastic ball ricocheting between two paddles, a net and a table without escaping that environment and hitting the ground or the walls around the table tennis players is "nominal."

Some point to managed care and its emphasis on payer-driven cost reduction as at least one cause of this year's product shortages. (As an aside, how come we never hear about payers being forced to reduce costs? Just payers reducing reimbursement? Answer: Managed care's enactment in 1983 shifted financial control of the industry to the payers.) Providers and suppliers responded in part with such distribution strategies as just-in-time (JIT) and low-unit of measure (LUM), neither of which keep pace with pandemic-induced and accelerated demand.

Others suggest providers stock three-to-four months of product on hand somewhere (either on site or with the vendor), but that costs money. So, too, does the notion of buying more product domestically.

The New Nominal has less to do with being normal; it has more to do with what achievements, outcomes, performance you'll accept as, say, optimal against the backdrop of your environment.

What we really need: Renewal.

Forget about The New Normal. The healthcare environment never should strive for "normal" again because of the overwhelming lack of control over the environment and individual patient physiology.

Administrators and clinicians alike must renew their confidence in and support of Supply Chain doing their jobs as they navigate through The New Nominal.


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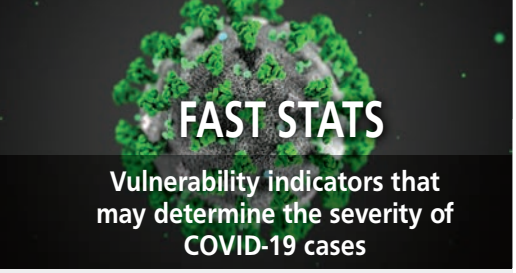

# FAST STATS

**Vulnerability indicators that may determine the severity of COVID-19 cases**

## ONE IN THREE

**Young adults may face severe COVID-19.**

## 33%

**Was the medical vulnerability indicator rate for males in the age group 18 to 25 and 30 percent for females.**

## 8.7

**Was the number of hospitalizations per 100,000 population for the18-29 age group in April.**

## 128.3

**Was the hospitalization rate per 100,000 population for patients over 65 in April.**

## 299%

**is the increase in the number of hospitalizations during the week ending June 27 for the 18-29 age group.**

## 139%

**is the increased rate for patients over 65 for the the week ending June 27.**

## 16.1%

**was the increased medical vulnerability for severe COVID-19 cases for non-smokers for 18-29 year olds.**

## 31.5%

**of smokers aged 18-29 had increased medical vulnerability for severe COVID-19 cases. The risk of being medically vulnerable to severe disease is halved when smokers are removed from the sample.**

## 10%

**is the increased medical vulnerability rate for patients with asthma.**

Source: UC San Francisco Benioff Children's Hospital report https://www.ucsf.edu/news/2020/07/418081/1-3-young-adults-may-face-severe-covid-19-ucsf-study-shows

# NEWSWIRE

## Challenges with White House Supply Chain Task Force and Project Airbridge

A memo dated July 2, 2020, from the Congress of the United States, House of Representatives, provides a summary of voluntary discussions between staff members of the Committee on Oversight Reform and representatives of six large medical equipment distribution companies that are playing a role in the Trump Administration's response to the coronavirus crisis: Cardinal Health, Concordance Healthcare Solutions, Henry Schein, McKesson, Medline and Owens & Minor. This memo also includes information provided by the Health Industry Distributors Association (HIDA), a trade group that has acted as a conduit between members of the healthcare distribution industry and the Trump Administration.

These private sector officials agreed to talk with Committee staff about challenges they faced over the past six months in providing personal protective equipment (PPE) and other critical medical supplies to communities across the country. They also agreed to provide information about their interactions with the White House Supply Chain Task Force and a project led by Jared Kushner known as "Project Airbridge," which provides free air transportation for certain companies bringing PPE into the United States.

On April 7, 2020, the Committee on Oversight and Reform and the Committee on Homeland Security sent a joint letter to the Federal Emergency Management Agency (FEMA) requesting documents relating to how FEMA is working with the private sector to acquire and distribute PPE and medical supplies. FEMA has not provided a single document in response to this request.

The private sector officials who spoke with Committee staff raised troubling concerns about the status of the nation's preparedness to combat the coronavirus crisis. For example:

- Industry officials told Committee staff that in the first three critical months of the coronavirus crisis—from January to March—private sector companies were desperate for guidance from the federal government, but the Trump Administration failed to provide it. According to these officials, calls with Administration officials were merely "informational" and "largely educational," and "folks in the industry saw that things were getting worse, and their requests for guidance was increasing week by week." They added: "Everyone was asking the same questions, but guidance wasn't coming."
- On March 28, 2020, the HIDA President and CEO Matthew Rowan sent a letter urging the Administration "to provide the strategic direction needed to more effectively target PPE supplies based on greatest need." He wrote: "Only the federal government has the data and the authority to provide this strategic direction to the supply chain and the healthcare system."
- Instead of procuring PPE directly, the Administration established Project Airbridge to provide transportation for PPE procured by private sector companies. Contracts for Project Airbridge do not require distributors to report back information about the pricing of PPE, despite the fact that taxpayers cover the costs of transportation. Distributors were told to deliver 50% of the PPE "across the customer base in the hotspot," but they were provided little guidance on how to prioritize specific end-users who need PPE most urgently or what to do with the other 50% of PPE imported at taxpayers' expense.
- Officials from several companies informed Committee staff that the Trump Administration, through the Department of Health and Human Services (HHS), spent many weeks pressing them to buy PPE directly from one particular Chinese company, but the U.S. companies declined because the Administration was asking them to "purchase at a price that was fairly high."
- Finally, the companies informed Committee staff that they have serious concerns that "raw material for PPE is now in a really bad position worldwide."The companies cautioned that prices for raw materials have gone up dramatically and that, for example, "raw material for gowns is unavailable at any price, at least in the quantities we need to make gowns." They warned that continuing to supply PPE under these conditions is "not sustainable."

Now that the Select Subcommittee on the Coronavirus Crisis is fully operational, this memo conveys information collected by Committee on Oversight and Reform staff and makes a number of recommendations on how to proceed. For example, this memo recommends issuing document requests to these companies and agencies to assess whether significant changes are needed to respond to the current resurgence of cases and prepare for a potentially even more disastrous wave of cases in the fall.

Starting in January, many components of the White House—including the National Security Council (NSC) and the Council of Economic Advisers—reportedly issued memoranda warning about the potentially devastating impacts of coronavirus and the need to increase U.S. supplies of PPE. In addition, the President's Daily Brief reportedly warned about the spread of coronavirus more than a dozen times.

More than two months later, on March 29, 2020, President Trump announced dur-

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ing a meeting with supply chain company executives that he had established a White House Supply Chain Task Force and Project Airbridge "to bring massive amounts of medical supplies from other countries to the United States."

Rather than procuring PPE directly, the Administration billed Project Airbridge as a partnership with the private sector that would quickly deliver critical supplies to communities that needed them. Participating private sector companies would purchase PPE in Asia, and the PPE would be flown to the United States at taxpayers' expense.

As the nation experiences a dangerous surge of new cases and hospitalizations, PPE shortages continue to endanger healthcare workers, especially in minority communities. The Trump Administration still has not offered a comprehensive plan for containing the pandemic, forcing states to craft individual responses to a nationwide crisis, and has also resisted calls to use the full powers of the Defense Production Act to expand the production of critical goods like PPE.

On June 15 and 18, 2020, FEMA provided two one-hour briefings to Committee staff. FEMA was unable to provide information on the Administration's procurement efforts prior to March 19, 2020, when President Trump directed FEMA to begin leading the federal response. FEMA referred to this date as "Day One for FEMA" despite the fact that the coronavirus crisis had been ongoing for months. When asked about efforts prior to this date, FEMA officials stated that they had "very limited knowledge about what HHS was doing."

On March 16, 2020, HIDA facilitated a call between major medical distribution companies and White House Coronavirus Task Force officials, including officials at NSC and HHS. In an agenda for the call dated March 16, 2020, HIDA again noted a list of things "Needed from Government":

a. One Voice from Gov't

b. Clarity on Prioritizing Customers

c. Clarity for customers on How to Access Gov't Inventories (e.g., SNS, Health depts)

d. Expedite Export (from China) and Import (to U.S.)

e. Expedite Raw Materials for Mask Production

The notes also confirm that the companies were concerned about product shortages:

a. Flu Tests

b. IV Solution

c. Thermometers

d. Hand sanitizer and surface disinfectant

e. Anything tied to respiratory conditions

The notes also indicate that the companies conveyed to the Trump Administration that they believed the industry faces a "long-term supply chain issue."

HIDA reported that in late March, the Private Sector Supply Chain Coalition appeared to take control of coordinating between HIDA member companies, FEMA and other Administration officials.

On March 28, 2020, the President of HIDA sent a letter to FEMA echoing its members' earlier requests for guidance." He stated: Specifically, distributors need FEMA and the federal government to designate specific localities, jurisdictions or care settings as priorities for PPE and other medical supplies.

Companies that do not participate in Project Airbridge are not covered by the memorandum of agreement (MOA), raising concerns about how those companies are coordinating the distribution of PPE to meet the most urgent needs. For example, Concordance Healthcare Solutions said it did not receive lists of hotspots for PPE distribution until it began participating in Project Airbridge on April 29, 2020.

In addition, even for companies that are participating in Project Airbridge, the MOA covers only PPE that they distribute through Project Airbridge. PPE that companies procure or manufacture separately is not required to be distributed to hotspots covered by the MOA, raising further concerns about the effectiveness and efficiency of coordination efforts.

Project Airbridge imported a relatively small amount of supplies distributed in the country. In a June 16, 2020, opinion article, Vice President Mike Pence wrote: "Our administration launched a partnership with private industry that, as of June 12, had delivered more than 143 million N95 masks, 598 million surgical and procedural masks, 20 million eye and face shields, 265 million gowns and coveralls, and 14 billion gloves." In fact, only about 7% of that PPE came through Project Airbridge.

In their June 18 briefing with Committee staff, FEMA officials confirmed that the Trump Administration has no involvement in directing PPE within hotspots. FEMA officials also explained that, for distributors other than those participating in Project Airbridge, there is no industry-wide guidance on where the most urgent needs are. FEMA officials stated that Project Airbridge is winding down and is now being used only to transport medical gowns on behalf of commercial entities. With respect to urgent needs going forward, FEMA officials conceded that "the supply chain is still not stable," but claimed that distributors can now "do it on their own."

The companies informed Committee staff that the White House Supply Chain Task Force asked them to visit potential PPE supplier leads in foreign nations, including China and Malaysia, to assess their viability for both federal and private PPE contracts.

Over the past several weeks, the number of coronavirus cases and hospitalizations has re-surged to dangerously high levels. In addition, multiple officials have warned about a second wave of coronavirus cases in the fall. For example, CDC Director Robert Redfield stated: "There's a possibility that the assault of the virus on our nation next winter will actually be even more difficult than the one we just went through." On April 28, 2020, Dr. Anthony Fauci, the head of the National Institute of Allergy and Infectious Diseases, stated in an interview: "In my mind, it's inevitable that we will have a return of the virus or maybe it never went away."

Company officials also expressed concern about insufficient raw materials. For example, according to Medline, "The raw material for PPE is now in a really bad position across the world." Medline noted that prices for raw materials have gone up dramatically and that "raw material for gowns is unavailable at any price, at least in the quantities we need to make gowns." Medline told Committee staff that the economics of supplying PPE in these circumstances are "not sustainable" and that the company is "losing money on every piece of PPE we sell, and doing it at higher magnitude then we have ever done it before." HPN

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# Dartmouth-Hitchcock team pulls Supply Chain through pillars of progress

*Strategic direction pushes beyond supplies, validated by COVID-19*

*by Rick Dana Barlow*

Since 2017, Dartmouth-Hitchcock Health's Supply Chain philosophy seems to have reflected the art and science of creating structure with LEGO blocks or Minecraft: If you build it success will come.

To Curtis Lancaster and his Supply Chain division team at the Lebanon, NH-based integrated delivery network that pokes into neighboring Vermont, Supply Chain as a category, descriptor, function and even title may not accurately befit what they do anymore.

In fact, they've punched through the traditional stereotype of simply moving boxes of stuff by pursuing and embracing deeper and more meaningful roles such as strategic planner, sourcing enabler, margin-enhancement deliverer, demand-planning innovator, communication facilitator and administrative ace-in-the-hold for the C-suite. They have remodeled and reconstructed their infrastructure around a quartet of performance improvement pillars of operation: people, technology, trade and innovation.

Four years ago, an academic medical center and teaching hospital anchored a loose federation of hospitals and clinics that lacked a cohesive supply chain engaged in many decentralized activities, according to Lancaster. Since then, they have centralized and vertically integrated supply chain activities that increased value system-wide and extended savings regionally.

"It's been our mission to look and act like a system," Lancaster admitted. "Each of our sites had their own independent supply chain, and we have worked hard to pull together as a system supply chain supporting each local business unit/system member." Dartmouth-Hitchcock also is one of the founding members of a regional purchasing collaborative called Northeast Purchasing Coalition (NPC) and leads supply chain initiatives and sourcing with local vendors for an alliance of more than 25 hospitals in New Hampshire and Vermont called New England Alliance for Health (NEAH). Dartmouth-Hitchcock accesses many supply and service contracts and initiatives through Vizient.

For several years, the Supply Chain division, led by Vice President Lancaster, has operated as a beacon of reliable, resilient service to a multitude of healthcare facilities spanning two states. The coronavirus pandemic certainly tested their framework and resolve to the point that the division outran the mad-dash scramble for depleting supplies brought on by panicked buying from a desperate and frightened public.

The Dartmouth-Hitchcock Supply Chain team doesn't take whatever lessons learned and success achieved from their demand-planning process and COVID-19 response for granted. They continue to scan the horizon to justify their mantra and motto to "think different" and "support the hands that heal."

For these reasons and their relentless pursuit of what's next, *Healthcare Purchasing News* selected the **Dartmouth-Hitchcock Supply Chain division** as its **2020 Supply Chain Department of the Year**.

## People matter

Five years back the Supply Chain department at Dartmouth-Hitchcock functioned more like an extended-stay truck stop, a place where professionals entered to freshen and refuel their career goals before venturing to another area on the next leg of their occupational journey. The recurring tactic wreaked havoc on consistency as hiring and retraining to attain the desired effectiveness and efficiency occupied daily activities.

To morph into a nimble visionary team from a dysfunctional reactionary group required dedication, effort and time, starting with recognizing people as the impetus for and operator of redesign and technology use, and integrating people at every turn within the organization's strategy.

Under Lancaster's leadership, the Supply Chain division established people as a key pillar of the organization's strategic plan in a roadmap for a dynamic group that gained leadership traction and visibility

# 2020 SUPPLY CHAIN DEPARTMENT OF THE YEAR

*Left to Right: Patrick Jordan (Chief Operating Officer); Krista Merrihew (Director, CQVA, Strategic Sourcing and Purchasing); David Coombs (Distribution Manager); Richard Casano (Director, Supply Chain Operations); Michael Shane Chapman, M.D. (Supply Chain Medical Officer/ Professor and Inaugural Chair of the Department of Dermatology); Mary Annear (Supply Chain Site Director, Cheshire Medical Center) (front); Anna Pinilla (Demand Planner) (back); Robert Simms (Manager, Strategic Capital); Nicholas Metcalf (Manager, Strategic Procurement); Steven LaTorre (System Inventory Control Specialist); Claire Nerenz (Supply Chain Program Manager); Hunter Fifield (Transportation Manager); David Campanella (Manager, Contracts); Joseph Opolski (Director, Contracting, Capital and Alliances); Curtis Lancaster (Vice President, Supply Chain); Katherine Meagher (Manager, Material Management, New London Hospital); Matthew Harris (Supervisor, Supply Chain Management, Alice Peck Day Memorial Hospital); Leah Greene (Supply Chain Business Manager)*

by turning challenges to opportunities and progressing through creativity. From this developmental progress, "we were at the table now," he noted. When referring to Supply Chain's pandemic sourcing, even their CEO remarked that the team "made a real impression – really phenomenal."

As the team advanced, Lancaster points to key skills that were honed and tested, such as "scheduling as it creates the demand signal; perioperative where product knowledge and use is critical and where scheduling and logistics are critical success factors. And, let's not forget system management where our recent experience leading through a crisis can be applied to leadership positions," he said.

If anything, they strove to become a group that could perform daily with grit and skill to handle whatever faced them, even a once-in-a-century pandemic that disrupted everything, he reflected.

"[COVID-19] confirmed we had what it took. In many industries you drill and practice so that you will be prepared for a future event," Lancaster told *HPN*. "Firefighters drill and prepare for when the fires come. Sports teams practice and prepare for the big game. As Mike Tyson explained in preparation for a boxing match, 'Everyone has a plan until they get punched in the mouth.' The pandemic punched us in the mouth … repeatedly. We learned that the mindfulness and resiliency we worked on, the communication and trust in each other kicked in like muscle memory. We trusted each other. We worked well together. The strategy directed us toward our goal, even in crisis: helping the hands that heal. Our ops director was in incident command and helped harmonize all our efforts."

The onset of COVID-19 not only tested their resolve but amplified and showcased their 2019 game plan execution as they embraced their motto to "support the hands that heal." Daily distractions came fast and furious, Lancaster added.

"Oftentimes people are viewed as cogs in a wheel when they are actually the grease that keeps things spinning," he said. "This old mindset comes from the belief that supply chain is a transactional exercise and not a strategic pursuit. There is also a tendency to look forward and outward for the next enhancement and improvement and not keep the focus on developing and mentoring the teams."

Traditionally, Supply Chain remained invisible and invited attention when something went wrong, according to Lancaster.

"Good things [can] go unseen and bad things make the loudest sound," he said. "We rarely were recognized for the work we did, much like a lightbulb isn't noticed until it is burned out and doesn't do its job."

Because Supply Chain had been operating in consistent performance improvement mode for several years, the emergence of the coronavirus and its escalation into a global pandemic that slammed national, regional, state and local supply chains, didn't ignite a crisis for Dartmouth-Hitchcock's Supply Chain team. They were fortified strategically and ready to act.

"Our response to COVID allowed us to shine," he said. "We succeeded in meeting the needs. This was recognized throughout our system, including by our CEO. While a recent event, it echoed the path we were on to change the perception of the organization.

"Consistency and dependability matter to our customers," Lancaster continued. "Things don't change overnight; however, working with leadership and front line staff to best support them shows through action our team cares, that we listen. By doing this we gain buy-in for our initiatives or enhance understanding when errors are made."

## New roles, narrative

Strategically, Supply Chain created several new roles to fortify and manage through data analytics. The most dramatic change in roles, per Lancaster? The Demand Planner position, which came just in time for the coronavirus.

"We created it from scratch, applying what we learned from other industries balanced with what we needed to serve our trading partners," he noted. [For more on Dartmouth-Hitchcock's demand-planning process, read "Demand-planning strategies predate pandemic, but produce perseverance" on page 20.

New positions also include a business manager to choreograph the data analytic work and reporting that is disseminated throughout the division; fully focused program managers Rosa Angulo and Claire Nerenz to specialize in selected areas, such as pandemic preparedness and regulatory compliance, and not double up for these tasks in addition to their regular jobs; dedicated legal counsel to facilitate the contracting process; an Item Master "master;" more analytically oriented specialists on Robin Boylston's technology team, Lancaster listed.

Other new roles include professionals supporting the reprocessing of N95 respirator masks and the logistics of distributing

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the reprocessed respirators both internally and externally to system members; staff like Adam Stewart, who worked in a new forward-stocking location to satisfy the needs of critically-short supplied products while still rationing to ensure control over the supplies; staffing a new offsite warehouse that stocks product in bulk to be distributed to system members, the organization's Service Center and NEAH members. "Lastly, we are performing scheduled rounding led by Operation Manager Hunter Fifield with the clinical team, who are directly supporting COVID-19-positive or -suspected patients to ensure proper PPE supplies," he added.

Supply Chain created a marketing narrative that told their story. "This allowed for stakeholders to truly see what we did – at least on paper," he said. "Our actions had to and did reflect the document. Readers seemed to gain an appreciation of the scope and challenge of our work. When you know the light is going to come on when you flip the switch, you don't carry extra light bulbs around with you just in case. You know it is going to work, perform its function and provide illumination."

Supply Chain also knew to initiate and develop partnerships with clinicians – doctors and nurses on the front lines and in the surgical areas. Preparation drove progress, according to Lancaster.

"We worked with [Dartmouth-Hitchcock] leadership to bring a part-time medical director, Dr. Shane Chapman, into the supply chain to help us better connect with physicians," he indicated. "We focused on analytics to make sure we came to meetings with accurate financial data, clinical data and evidence-based research. We conducted one-on-one meetings with key service-line leaders to discuss opportunities, collaborate and build trust. We did this before any group meetings. Our staff joined many of the clinical and safety committees to make sure we were aware of emerging needs and articulate the help we could provide. Finally, we expanded Krista Merrithew's value analysis team with additional registered nurses."

## Technology in rotation

When it comes to technology adoption and implementation, supply chain departments tend to fall into three distinct technology groups, indicated Richard Casano, Director, Supply Chain Operations.

The first reflects a group with not enough technology to be anything but reactive; the second possesses too many technologies that muddy the water, causing more confusion than clarity; and the third maintains the correct amount of technology to grow deep expertise and skill, he explained. They gravitated to No. 3, but acknowledged the ease to languish within No. 1, and become seduced and trapped within No. 2, making escape a challenge.

"I have colleagues who have every tool under the sun," Lancaster said. "However,

Dartmouth-Hitchcock

## Fast Facts

**Headquarters:** Lebanon, NH

**Facilities: 5 member hospitals and one visiting nurse organization**

- Dartmouth-Hitchcock Medical Center, Lebanon, NH
- Alice Peck Day Memorial Hospital, Lebanon, NH
- Cheshire Medical Center, Keene, NH
- Mt. Ascutney Hospital and Health Center, Windsor, VT
- New London Hospital, New London, NH
- Visiting Nurse and Hospice for VT and NH, White River Junction, VT

**Other facilities**

- D-H Center for Connected Care
- 53 Residence Programs
- Norris Cotton Cancer Center, NCI Designated Comprehensive Cancer Center
- CHaD (Children's Hospital at Dartmouth)
- DHART (Dartmouth-Hitchcock Advance Response Team)
- 4 retail pharmacies
  - Dartmouth-Hitchcock Medical Center Pharmacy, Lebanon, NH
  - D-H Pharmacy at Centerra, Lebanon, NH
  - Cheshire Medical Center Pharmacy, Keene, NH
  - Dick Hall's House Pharmacy at Dartmouth College, Hanover, NH

| Statistics | 2019 | 2020 |
|---|---|---|
| Licensed beds | 650 | 650 |
| Staffed beds | 493 | 509 |
| Inpatient admissions | 28,000 | 27,481 |
| Surgical cases | 33,633 | 30,215 |
| Outpatient encounters | 1.6 million | 1.55 million |
| Emergency room visits | 32,000 | 30,000 |
| Clinic visits | 1,100,000 | 1,021,304 |
| Babies delivered | 1,770 | 1,685 |
| Telehealth appointments | 40,831 | 47,599 |
| Total net revenue | $2.3 billion | $2.34 billion* |

**Leadership**

- CEO – Joanne M. Conroy, MD
- CFO – Daniel P. Jantzen, CPA
- COO – Patrick F. Jordan III, MBA

### Supply Chain Division

**Vice President, Supply Chain Division:** Curtis J. Lancaster

**Joined organization:** 2016

**Previous position:** Vice President, Supply Chain Management, MultiCare Health System, Tacoma, WA

**Started supply chain career:** Started with UPS in 1987 as a part-time air operations administrative support, promoted to Finance and Accounting Supervisor, then served as Air Operations Supervisor; transitioned to Healthcare Supply Chain in 2002.

**Managers (at Dartmouth-Hitchcock):** Vice President has 7 direct reports

**Employees/FTEs (at Dartmouth-Hitchcock):**

- 151 FTEs for Supply Chain Division
- 13,000 employees for D-HH (including more than 2,400 physicians, residents, and fellows)

**Conduit to CEO:** Report to COO who reports to CEO

**GPO affiliation(s):** Vizient and Intalere

**Annual purchase order volume (FY2020):**
$347,088,157 excluding Pharmacy

**Annual purchasing volume/supply expense (FY2020):**

- $516,986,000 in supplies and service expenses with $347,088,157 of that on POs
- Total number of POs: 115,721
- PO quantity for supplies only: 77,369
- Total supply-only expense: $170,383,756

**Percentage of purchase orders transmitted electronically:** 75%

**Percentage of requisitions processed electronically:** 65%

**Division functions:**
Strategic Capital Management, Strategic Procurement, Contracting, Strategic Sourcing, Supply Chain Operations, Clinical Quality Value Analysis, Service Center, Medical Supply Distribution, Linen Services, Patient Transportation, Printing Services, Mail Service, Supply Chain Technology, Demand Planning, NEAH (New England Alliance for Health) (e.g., inventory, distribution, sterile processing, etc.)

**Purchasing and contract management:** Centralized

**Total annual operating expenses:**
$2.23B in 2019
$2.4B in 2020*

Total net revenue:
$2.30B in 2019
$2.34B in 2020*

* Annualized for 2020

Source: Dartmouth-Hitchcock Health, July 2020

Page 14


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the tools don't align to support an overall analytics strategy. Data and analytics are pillars of our strategic plan. Data should inform decision making; inform your course towards the beacon. And, you've got to fully use what you have. That means learning the tools, spending time with it, experimenting.

"Too many technologies can seemingly compete with each other," Lancaster continued. "Teams can lose track of which technology is specialized in which arena or why they have it in place. If the technology is placed and never used or they compete and have conflicting data, the worth of the product is completely lost. Our team escaped this cycle by gaining support from senior leaders and clinical teams by listening to what their focus is, aligning our mission and vision statements with technology that will enable best practice, patient and employee satisfaction. Icing on the cake is always cost savings and increased value."

## Trade involves relationships

Dartmouth-Hitchcock's Supply Chain division applies the term "trade" as shorthand for interactions among internal stakeholders, such as clinicians and patients, as well as with external partners, such as manufacturers and distributors. Some might classify this mindset as customer service, but Lancaster's team plants it into their strategic plan as a foundation to "interact, process, benefit."

For example, for the last several fiscal years, Supply Chain has exceeded its financial goals, contributed to enhanced margin and a healthy bottom line as well as integrated value over preference in product selections through clinical collaboration, data analytics and fiscal stewardship, Lancaster indicated. In fact, through data analytics the team identifies safety issues and leads efforts to reduce errors. One example is RASH, an acronym for "recalls, alerts, shortages/substitutions and hazards." Still, Supply Chain remains "fully ingrained" in product and service decisions, safety, service and productivity directly and indirectly, he added.

Supply Chain's Capital Equipment Manager Bob Simms actively serves on the Capital Committee for sourcing, analysis and contracting. Lancaster represents Supply Chain on the FTE Committee, which covers services contracts.

Focusing on value over preference can be difficult, according to Krista Merrihew.

"Getting stakeholders, specifically clinical stakeholders, to understand that we are striving to act as a system both financially and clinically is a challenge," Merrihew admitted. "We want patients to have a consistent, customer-oriented experience when in our facility. Patients are more aware, perhaps more than we realize, and very cognizant of the products used on and in them. Consistency of products creates for a consistency of experience. With clinicians, we share financial and evidence-based product research to support sound decision-making."

Supply Chain meets monthly with the certain clinical chairs to collaborate on product and vendor decisions.

As an example, by keeping close watch on contract terms and conditions, especially expiration dates, as well as collecting ample financial and clinical evidence on orthopedic and spinal products, Supply Chain was able to justify and rationalize discussions and efforts on product and vendor selection, according to Merrihew. Moreover, they "met individually with physicians in order to understand their needs and thoughts outside of a group environment, worked with Perioperative Services to understand the operational changes that may be impacted by a product change and worked to build a strategic relationship with the vendors," she noted.

Working together in an academic setting with the orthopedics chair, they achieved a sole-source agreement for hips and knees, and narrowed the number of spine product vendors to two, which alleviates clinical product variation and reduces costs.

Page 16

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The organization's Medium Impact Supply Chain Committee functions as a value analysis team for items costing $50,000 or less. The MISC includes physicians, other clinicians, clinical engineering, safety and finance professionals. Shane Chapman, M.D., serves as the official Supply Chain Physician liaison, according to Merrihew. Krista Merrihew, R.N., serves as Director, Clinical Quality Value Analysis (CQVA) and Strategic Sourcing. Together, they set CQVA agendas, call meetings and facilitate discussions.

The MISC discusses product requests brought to it in a standard format that includes clinical need, product efficacy, product cost, total cost of ownership, return on investment and reimbursement terms.

"It helps to have a physician assume such a leadership role when making clinical product decisions. It also helps that Dr. Chapman sees patients several times a week. It lends to the credibility of the position and department," Merrihew added.

Collaborating with clinicians doesn't have to be complicated, Merrihew insisted.

"Do what you say you will," she advised. "Learn what they are trying to accomplish, set a strategy together and let them know you are trying to help them. Bring useful accurate data to the discussion, both financial and clinical. It also helps to hold one-on-one meetings with clinical stakeholders prior to any group meetings. This builds trust and collaboration."

## Innovation means business

Fostering innovation within Supply Chain required fomenting a new mindset that eschewed a risk-averse mentality, while building on fundamentals.

"If you place your hand too close to fire and get burned, you are hesitant to go near fire again for fear of getting burned again," Lancaster noted. "In the supply chain, this mindset causes you to become entrenched in safe activities that have value but don't have the contemporary or transformational outlook needed to support the clinical enterprise. Old school, transactional thinking with limited vision and no strategic plan are opposite of our mindset of embracing the improbable and challenging existing processes.

"This comfort also happened over time, supported by lack of understanding of the true value the Supply Chain can offer," he continued. "Decentralized contracting and sourcing and lack of control over all supply chain functions led to lack of control and visibility of possible issues and unrealized value. Over the last few years our team has transformed through system methodologies, documented and supported [standard operating procedures] and trust within the organization at the highest level."

Lancaster references a basketball analogy to explain their developmental, team-building strategy.

"You teach fundamentals like dribbling and layups before you introduce a no-look pass and three-point shot," he said. "We set out to do both at the same time. What we lacked before was the ability to pull the team together in an organized fashion and conduct ourselves as the team. This meant realignment of the team; just like in basketball you don't need ten centers, you

## Dartmouth-Hitchcock Supply Chain team salutes supplier partners

*Who supports an award-winning healthcare supply chain organization? Dartmouth-Hitchcock Health's Supply Chain Division appreciates the product and service companies that have helped the team develop and improve their operations and performance. The team shines a spotlight on 15 below that have helped them make a difference and succeed.*

**Alvarez & Marsal** is our trusted advisory firm that helped us develop and implement our Strategic Plan, thereby establishing the beacon that guides us.

**Greenhealth Exchange** serves as a valuable forum for moving to suppliers that provide a "green perspective." This has helped us incorporate the habit of assessing suppliers from multiple dimensions, not just cost.

**Green Mountain Messenger** provides us with courier services in New England. Their flexibility and responsiveness has allowed us to respond to emergent needs, but more importantly to expand our logistics network, while helping us focus on a green solution.

**Hammond & Ebersole** is our workforce development partner that has worked directly with Supply Chain leadership and staff on developing people through regular group meetings, personal coaching, mindfulness and empowerment.

**Lumere** (which is part of **GHX**) provides us with a useful workflow solution that has become a valuable tool to standardize and streamline the product request process.

**Resilinc** plays a key role in supplier resiliency transparency for us, providing real-time and on-demand data on global supply disruptions.

**Surgery Exchange** provides the technology that links our case volume with vendors and plays a critical role in efficient demand planning.

As our primary distribution partner, **Medline** has helped enhance logistics efficiency at our central warehouse and supplies cost-competitive, self-manufactured products.

**Medtronic** became a strategic partner through true transparency, while partnering to enable our demand-planning pilot. We also served as a beta site for their field inventory management solution driving efficiency in surgical scheduling and OR efficiency.

**PartsSource** represents our partner for cost-competitive equipment and capital planning that has enabled us to build a reliable, three-year capital replacement plan.

**Ricoh** provides us with the right equipment and print solutions that allows us to develop and implement in-house print services. Our Print services department is market-competitive from both price and product standpoint.

Our data analytics partner **SCWorx** assisted us in developing a single, system-wide item master. Through their process and dashboard, we perform item master maintenance, contract compliance and benchmarking activities.

**Vizient Advisory Solutions** has helped us realize significant cost savings and value through contracting, performance improvement and alignment with our goals.

Our office supplies partner **WB Mason** continuously brings us new products and services, adapts to changing requirements and has helped us save money without sacrificing quality.

While we slowed our work with **Zipline** due to the pandemic, we felt it necessary to partner with a leader in the drone industry to get a sense of how that technology within the context of healthcare delivery would function. We found them to be a leading-edge solution to help us "Think Different."

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need some forwards, guards and a point guard calling the plays and keeping the team focused. Stepping back and refocusing on fundamentals not only strengthened our output to our organization, but it also helped our team become closer, enabling us to see how we all support each other directly or indirectly."

The team also recognizes its role extends well beyond supplies into other areas. For example, in purchased services, Supply Chain helped various departments save nearly $2 million in travelers' costs – supplementary staff to augment areas that cannot hire in a timely manner – to human resources initiatives in insurance and benefits with more than $5 million savings realized or in process, according to Greene.

They track much of this through their financial dashboard, which incorporates their PeopleSoft MMIS ERP module, item master and SCWorx for benchmarking, and is shared with finance monthly and with the C-suite.

"We recognized our data is a source of truth throughout the organization and in multiple systems, and this became a priority for us," Opolski said. "We work with SCWorx to cleanse and help maintain our item master. They also provide us with analytics like benchmarking and contract compliance. This was all enabled by a Data Governance structure and process we established when we embarked on the quest for a single system-wide item master. This governance included the creation of a Data Rulebook where rules for item descriptions and maintenance are memorialized."

Supply Chain also inserted three staffers in the Operating Room to ensure product availability, address quality concerns and avoid expedited freight charges.

"They are actually Supply Chain Technicians we've taught to look out for supply issues, but also serve as customer service agents within Periop acting as navigators with the periop staff," she added.

To more efficiently manage outdated equipment and capital replacements, Dartmouth-Hitchcock created a reverse logistics process for these "hidden assets." Through this process they've sold used, functioning equipment that generated several hundred thousand dollars, according to Michael Ackerman, Strategic Sourcing Specialist. They work with auction brokers to sell to Third World healthcare facilities and also deal with smaller, budget-driven facilities in closer proximity.

"The project is in its infancy, but we are currently selling our capital and medical assets to five vendors," Ackerman said. "We haven't found one vendor that always gives us the best price, so we leverage all offers. We also sell and/or trade to our system members and NEAH."

To gauge customer satisfaction levels with service provided, Supply Chain rolled out HappyOrNot's survey tool to gain quick insights from a smiling face to a sad face at the push of a button, according to Casano. Their motivation? Formal meetings are not always conducive to the customer sharing true feelings, he indicated.

"We thought that real-time alerts based on how things are going throughout the day would be a nice way to hear the voice of the customer in a different way, Casano said. "It helped us to identify which units were having some concerns and also which time of the day so we could diagnose the problem. Was it a product availability issue, customer service, communication breakdown?, as examples. This allows us the ability to focus our resources where they are needed and to learn how to better connect."

The lessons were enlightening.

"We learned that a nursing floor tech took the supplies from the clean supply room and moved them to supply carts at a certain time of day and then the clean supply room was empty of a few products," Casano recalled. "This was a quick fix. Another time we learned there was a change in practice that caused product to run out and this alerted us to the problem. Anything that helps to increase communication with our customers and allows us close to real-time monitoring of performance means we can increase our ability to serve our customers. The better we support the clinical teams, the better the patient experience is. We are here for our neighbors, our friends and our family – those are our patients." **HPN**

Cover photo by Lars Blackmore, Ameridane Press. All other photos by Mark Washburn, Senior Photographer, Dartmouth-Hitchcock Health

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***Gavin Fisher, Supply Chain Tech, picks and stages an order to go to a hospital clean supply room.***

***Don Borgeous, Supply Chain Tech, scans labels to receive products into the system.***

***Left to Right: Ladda Marshall (Supervisor, Printing Services), Steven Heijn (Printing Services Lead), and Gary Cookson (Printer) cover internal printing needs.***

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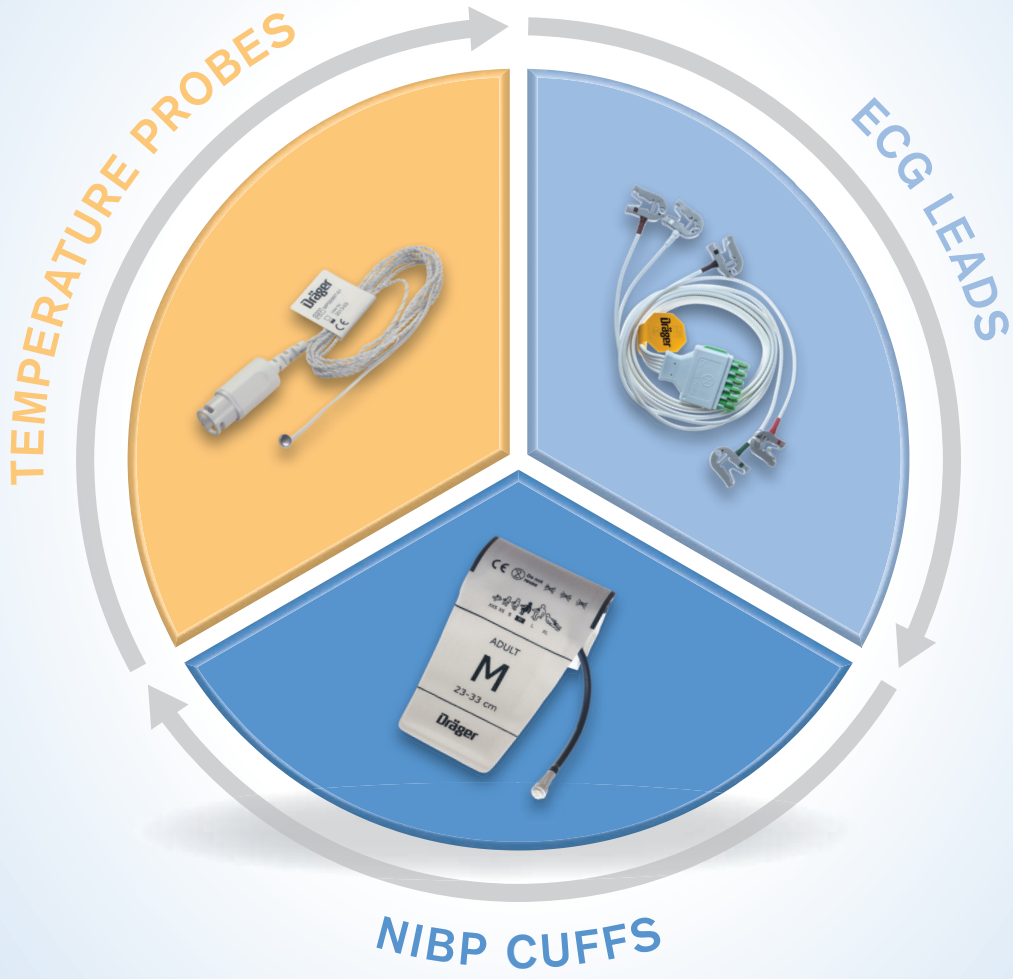


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# Instrument preservation a full-time operation

*by Kara Nadeau*

For healthcare organizations, surgical devices and instrumentation have significant impacts on financial and clinical outcomes. There is the upfront financial investment to purchase these items, and the cost of ongoing maintenance and repairs. Having correctly functioning instruments available for patient cases enables the operating room (OR) to perform procedures and generate revenue, while lost, damaged or otherwise compromised instruments can result in case delays and potential patient harm.

The OR and the Central Sterile/Sterile Processing Department (CS/SPD) are the two key departments responsible for instrument preservation. Their actions directly impact instrument quality – and one another. Unfortunately, CS/SPD professionals often report that OR teams don't always understand their role in instrument maintenance, believing that instrument care and cleaning is the sole responsibility of the CS/SPD. In these cases, when the OR neglects to perform the proper point-of-use cleaning, allows bioburden to dry on instruments and/or sends instruments to the CS/SPD in a disorganized manner, it increases the complexity and time of reprocessing, damages instruments and puts patients at risk.

On the other hand, when the OR takes the necessary steps to clean and care for instruments before, during and after use, instrument quality is maintained, reprocessing is streamlined and OR teams are more likely to have safe, effective and complete instrument sets available when they need them.

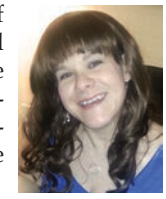
The OR can work together with CS/SPD to maintain and preserve surgical devices and instruments through open communication and collaboration through the initial prep, active use, cleaning and sterilization process.

## Before the case

Before the surgeon has an instrument in his or her hand, there are steps the OR team can take in collaboration with the CS/SPD to support the preservation process.

### Have what you need....

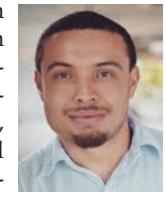
According to Amanda H. Coss, BBA, CRCST, CIS, CER, CHL, National Education Coordinator, Mobile Instrument Service & Repair, the OR team should first check that they have all of the instruments they need prior to starting a case because lack of pre-procedure planning and preparation can have negative downstream impacts.



*Amanda Coss*

"Be well prepared for the case," said Coss. "Have all your instrumentation available that you may possibly need for the case on the case cart. Instrumentation tends to become damaged when there is an urgency to get instrumentation to the OR. During emergent times, care and handling of instrumentation, by human nature, is not first priority."

Not only is it important for the OR team to have the right instrumentation in hand, they must also have the supplies they need to assist in instrument preservation prior to the start of the case, explains Dontaye Jones, BS, CRCST, CHL, CIS, CER, Aseptic Technical Solutions. He states:



*Dontaye Jones*

"The OR can help with instrument preservation before a case by ensuring they have the following: Enzymatic solution, sterile water, hard-sided container labeled 'biohazard,' and tags or locks for turnover of instruments/trays," said Jones. "They should also perform an initial count/inspection of instruments per set according to the count sheet/recipe on the back table to ensure everything needed for the case is sterile and ready inside the room, test the functionality of scopes and cameras, and have repair locks or tags for broken instruments or those that need sharpening."

### ...But only what you need

While it is critical for the OR to have what it needs up front in terms of instrumentation and supplies, it is also important that trays don't contain unnecessary items. According to Michael Matthews, Director, Clinical Education and Training, Northfield Medical, recent studies have demonstrated that less than 20 percent of surgical instruments are used consistently in a single procedure.

"This means that as much as 80 percent volume of production in the Sterile Processing Department is waste," said Matthews. "It is no surprise then, that most SPD technicians find it very difficult to give any instrument the time and attention necessary to ensure that it functions at the highest level of quality. Operating room personnel should partner with SPD and surgeons to streamline their instrument sets. Doing so will enable SPD to clean instruments more quickly, inspect instruments more thoroughly, as well as reduce the overall spend on maintenance and replacement."

Kevin Anderson BSN, RN, CNOR, CSSM, CRCST, CHL, CIS, CER, Clinical Education Coordinator, Healthmark, recommends that the OR check case carts on the day of surgery to make sure that all the instruments they need are available and that extra instruments do not get opened by accident. This addresses any short-term issues related to unnecessary instrumentation, but in order to get to the root of the issue, OR teams must take a hard look at physician preference cards.

"The long-term way to help is to assist those in charge of preference cards to make sure that they are accurate and that instrument sets are optimized," said Anderson. "That means, if instruments in the set are not being used consistently, then they should be removed and considered for peel pouch back-up stock."

Sharon Hadley, BSN, RN, CNOR, CSPDM, CHL, CFER, Principal Consultant, STERIS Instrument Processing Solutions, recommends that OR teams regularly review the contents of trays and remove excess instruments, since on average, at least 80 percent of the instruments opened for a case go unused.

*Sharon Hadley*

"This is termed tray optimization," said Hadley. "Removing the underutilized instruments prevents over-processing and decreases processing time (due to a reduction of instruments on the tray). The instruments removed from the tray can then be packaged as single instruments or used to help build additional trays."

"Powered by OpFlow technology, this process can take place using analytics driven by actual instrument usage data collected in the operating room," Hadley added. "Being able to visualize instrument

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usage on a surgeon and procedure-specific level for a given tray enables you to reduce excess instrumentation and confidently implement optimized tray configuration changes."

But what does an OR team do when they continue to find unnecessary instruments on trays regardless of physician preference cards' updates? Just don't open them up, says Seth Hendee, CRCST, CIS, CHL, CFER, CSPDT, CFER, Clinical Education Coordinator, Healthmark Industries.

"Extra instruments and/or sets may be added to a case for different reasons," said Hendee. "For example, they are often there in case an instrument is dropped. Another reason for additional instruments is to accommodate for a potential change in the procedure, such as shifting from a laparoscopic case to an open. Not opening instruments that may not be used is a simple preservation step. While having extras on hand can be helpful, keeping them unopened until you are sure they will be used will save them from a processing cycle they did not need."

### Get organized

"Using instrument organization systems helps increase efficiency in the SPD by allowing staff to quickly identify and organize sets and identify any missing or misplaced instruments," said Troy Scroggins, Sterile Packaging Product Manager for Aesculap. "In the OR, organized sets allow easy selection of the correct instrument and reduce surgical case time. It also extends instrument life by securing instruments so they are less likely to be damaged during processing and transportation. This translates to lower repair cost and higher set utilization. The higher rate of complete sets of better quality instruments delivered to the OR leads to improved relations between the OR and SPD."

### Perform a quality check

OR teams should take the time to check instrument quality pre-procedure, explains Sharon Greene-Golden, BA, CRCST, CER, SME, FCS, Manager Central Sterile Processing, Adventist HealthCare Shady Grove Medical Center.

"The OR team members can make sure they are handling the instruments with the utmost care while checking for any contamination or the working ability," she said. "It is important that the instrument be completely removed and checked before the case begins. This process requires that our OR team members are in the surgical case room before the patient and doctor arrive."

*Sharon Greene-Golden*

## During the case

While the patient on the table is the main priority of an OR team during a case, there are steps they can take to preserve instrument quality without detracting from patient safety or care.

### Handle instruments carefully

Hendee points out that while stainless steel instruments are very strong and durable, they are not "bullet-proof." Therefore, careful handling of the instruments by the OR team during a procedure will aid in preservation.

"Cutting edges, grasping jaws and other such delicate sections of instruments are prone to easy damage," said Hendee. "Of particular concern are coated electrosurgical instruments. This coating is very easily damaged, and when that happens, it becomes a patient safety and OR personnel hazard. Leaks in electrosurgical instruments are known causes of patient burns and surgical fires."

*Keep surgical soils from drying onto your instruments with Healthmark's HumiPak*

### Clean at the point-of-use

As instruments and devices are used in a procedure, they encounter and can accumulate bioburden such as skin, flesh, blood and bone. Hendee explains how long-term exposure to this bioburden can damage instrumentation, stating:

"Patient soils are very harsh on instruments for two reasons. First, they affect the instrument's surface and can cause rusting and pitting if left on for prolonged periods of time. Second, when soils are left to dry, they become very difficult to remove. This may require longer soaking or multiple reprocessing cycles to finally get all the soil removed, or worst of all, encourage someone to use incorrect tools to clean them. Wire brushes and scouring pads may remove the debris, but they will also cause damage to the instrument's surface, which will cause or at least accelerate rusting and pitting."

Point-of-use cleaning of surgical instrumentation is a well-known preservation practice, one that is recommended by the Association of periOperative Registered Nurses (AORN), the Association for the Advancement of Medical Instrumentation (AAMI) and the Association of Surgical Technologists (AST).

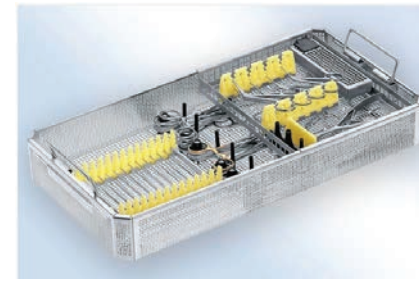
According to Greene-Golden, AORN section 3.2 to 3.3.2 describes guidelines for perioperative practice related to the care of instruments as they are used. She states:

"Point-of-use cleaning is the main goal for an OR team to help the sterile processing team in the preservation of the instruments used during the case. It requires the removal of gross soil and helps to stop the formation of biofilm. This process also helps the sterile processing team in their ability to clean the instruments without the worry of blood, organic material and debris that can cause corrosion, rusting and pitting. Failure of OR staff to perform point-of-use cleaning can make it challenging for CS/SPD staff to clean all of the instrument's surfaces, thus reducing the efficacy of the subsequent sterilization process. If it is not clean it cannot be sterilized."

When asked what steps the OR can take to help with instrument preservation during a case, Tim Cochran, Aesculap Technical Services Senior Marketing Manager, states:

"Instruments should be wiped as needed with a low or non-linting wipe and moistened with sterile water when possible during the procedure to remove gross soil (ie, blood and body fluids,) since these fluids are corrosive. Saline should not be used for pre-cleaning or keeping instruments moist because saline can cause damage when left on instruments for an extended period."

"Instruments with lumens should be irrigated as needed throughout the surgical procedure to prevent obstruction due to organic material," he adds. "Use sterile water for this when possible. Irrigation with sterile water maintains hydration of the bioburden on surgical instruments, which facilitates the cleaning of surgical instruments and prevents tissue damage."



*Aesculap's wide range of baskets and Instrument Organizational System (IOS) pieces allow for customized instruments sets.*

Angela Lewellyn, Director of Development and Research, Advantage Support Services, explains how the surgical technologist or another OR team member who is intraoperatively "scrubbing the case" can remove gross contamination

from the instrumentation intra-operatively using a lap sponge.


*Angela Lewellyn*

"It (the sponge) can be dampened with sterile water and readily available for use from the surgical drape area or from the mayo stand to wipe off gross contamination during the case," said Lewellyn. "A basin of sterile water can be further utilized once the case is complete. The technician can remove additional debris from lumens and other devices that may contain gross contamination, like bone from reamers used during orthopedic cases. Introducing this practice change to the interdisciplinary team is an approach to collectively assure uniform care for all surgical patients."

As Hadley explains, it is not just the CS/SPD that benefits from point-of-use cleaning. Steps taken perioperatively to remove bioburden save the OR team time post-operatively as well.

"By keeping instruments clean perioperatively, the OR staff can significantly decrease the amount of time and effort it takes to decontaminate and clean instrumentation post-operatively," said Hadley. "Some methods that the OR staff can employ include cleaning gross bioburden and body fluids from the surface, teeth and groves of instruments and flushing lumens regularly during the procedure using sterile water."

### Avoid damaging elements

"Some of the biggest enemies of surgical instruments are saline, eschar and rough handling," said Michelle Lemmons, RN, BSN, Clinical Educator, OR, Key Surgical. "Intra-procedure point-of-use care should include: Only using the instruments for the purpose for which they were created, and only using sterile water to wipe/soak instruments and lumens. During electrosurgical cases, an anti-stick solution should be applied to the electrosurgical instrument prior to use to avoid eschar sticking."

Matthews points out how stainless-steel instrumentation is protected from harmful elements by a nanometers-thin layer of a naturally forming compound called Chromium Oxide, which is what makes these instruments so resilient. However, Chromium Oxide breaks down with prolonged exposure to chloride-ions, which are found in blood, saline and disinfectant solutions such as Betadine.

"This is why point-of-use cleaning is so critical," said Matthews. "If chloride-ions are allowed to sit on stainless steel instruments they will break down the layer of Chromium Oxide exposing the mostly-iron surface of the instrument to water. And as everyone who has ever accidently left one of their garden tools out in the rain knows, iron and water equal rust. With surgical instruments this takes the form of 'pitting,' which is essentially tiny holes in the instrument. Instruments with pits cannot be cleaned properly and are structurally unstable, making them unsuitable for use on patients. The loss of functional instruments is completely preventable through ensuring that instruments are wiped with sterile water during procedures, and blood is not allowed to dry on instrument surfaces."

Experts agree that saline is a major threat to instrument preservation because it is caustic to stainless steel. Instead, OR teams should use sterile water for instrument pre-cleaning and take steps to ensure saline in not inadvertently used in place of sterile water in the OR.

"In many instances, when adding sterile water to the surgical field as a new practice, it may raise concerns for some team members and surgeons to have the water and saline near each other," said Lewellyn. "The concern usually stems from getting them mixed up if the case is moving quickly. One solution to remedy this concern is for the team member scrubbing to have both sterile water and saline labeled either on the back table together or the sterile water separate from the back table on a sterile ring stand."

## After the case

The OR team's responsibility for instrument preservation doesn't end at the end of a case; rather it continues until the instruments are safely back in the CS/SPD for reprocessing.

### Pretreat

While instruments should be promptly transported to decontamination following use so that the cleaning process can begin in timely manner, that is not always possible. When instruments sit and bioburden is left to dry on them, it makes it extremely difficult for CS/SPD staff to remove. Therefore, OR staff members must keep instruments moist and pretreat them with an enzymatic presoak solution to begin the decontamination process in the OR.

"To aid in the removal of blood soils in the CS/SPD, the OR can use a pre-treatment spray before instruments are sent to the CS/SPD," said Ann Mangskau, an Assistant Marketing Manager with Ecolab Healthcare. "The pre-cleaner spray helps maintain moisture of the potentially corrosive blood soil, making it easier to remove during manual cleaning."

"It is important to avoid the use of anything that may cause damage to instruments in your point-of-use pre-treatment process," Mangskau added. "Saline, like blood soils, contains chlorides and is corrosive to stainless steel instruments and should not be used for instrument pre-treatment. Pre-cleaner sprays are formulated with components that are compatible with instrument materials, and products containing corrosion inhibitors provide additional instrument protection over those that do not."


*Ecolab's OptiProGel Instrument Pre-Cleaner*

"Disassemble all multi-part instruments, spray enzymatic on the instrumentation to start the decontamination process or you can drape a wet towel over the instrumentation to keep the bioburden from hardening onto the surface," said Coss.

"Many pre-treatment products are formulated to keep instruments moist for up to 72 hours, have bacteriostatic properties, help prevent corrosion, and contain surfactants and emulsifiers that help lift surgical soil from the surface of instruments," said Lemmons.

*Key Surgical's Electro Lube is an anti-stick solution designed for electrosurgical instruments.*


### Organize and protect

The way OR team members place instruments back into their trays is a major factor in protecting them from damage or loss. Jones recommends the following practices:

"The OR can help instrument preservation during a case by the following: Keeping all instruments opened and used with their respective surgical trays, open hinged instruments, disassemble multi-part instruments, separate reusable sharps, place heavy instruments on the bottom of the tray with lighter instruments on top, be very careful with the handling of scopes

Page 24

and cords (e.g. do not place any items on top of them), and tag and separate all malfunctioning/broken instruments."

"Placing expensive cameras, rigid endoscopes, light cords, etc. in a way that minimizes the chance of damage is extremely important," said Anderson. "I've seen these items come down to SPD all knotted up and just thrown into case carts haphazardly. These need to be sent down with the intention to prevent damage by placing them carefully back into protective containers."

### Transport with care

"Careful handling and transport of used instrumentation is an effective way to preserve them," said Hendee. "Instruments that are hastily put into a transport bin or case cart are more likely to be damaged than those that are organized. When dealing with truly delicate instruments, separating and immobilizing them after the procedure, and then during transport, will reduce the chances of them becoming damaged greatly.

"Many delicate instruments are placed into specialty organizing containers," Hendee added. "These containers may have silicone mats or holders to stop instruments from shifting and banging together during transport, whether they are clean or dirty. Replacing instruments into those organizers will help protect them in transport."

"Additionally, the OR staff can refrain from sending down clean instruments on the decontamination side, which adds time to the SPD when they are required to decontaminate instruments that were not used," said Mary K. Lane, MHA, CSPDM, CSPDS, CSPDT, MK Lane SPD Consulting. "Further sending down trash and sterile supplies that were not used during the case is a huge waste of financial resources and occurs quite often."

*Mary K. Lane*

## Tips for getting OR on board

Knowing what is required of the OR and convincing the OR of the importance of performing these tasks are two entirely different matters. We asked our experts for tips on improving compliance with instrument preservation practices among OR staff members and they offered the following advice.

### Show them the money

"Show them the department's instrument repair bills - I am only kidding, well sort of," said Hendee. "A large portion of an SPDs budget can be spent on instrument repairs. Instruments are a large investment, to begin with, and repairing them is a cheaper alternative to replacing them. Anything the OR can do to keep instruments out of the repair bin, which every SPD has, will help the department have funds to spend on other needs."

"Secondly, I would also show them the department's back table, and yes, every SPD has one of those too," Hendee added. "It is not the same as an OR back table, however. This is where sets go when they are missing an instrument that is damaged or missing and is now awaiting replacement or repair. Especially with specialty or one-of-a-kind sets, having the set on the back table is a major issue and can cause case delays or cancellations."

### Find common ground

"SPDs must learn to communicate in ways that speak to the priorities of the OR, and vice-versa," said Matthews. "Common ground that will appeal to both groups is the need for consistency, reliability and predictability. Each department must understand their part in ensuring that the instruments that are used on patients are safe and function as needed by the surgeon. SPD has an opportunity to become the expert on the tools that are being used by the OR staff. Equally, SPD must remain teachable about how the instruments are used during procedures so that they can better assess the functionality of the instruments. In short, both SPD and the OR have a responsibility to become experts on their own role while respecting the roles of their peers."

### Hold the OR accountable

"A policy pertaining to the process with strict enforcement of accountability is a great starting point," said Lane. "When the OR and SPD have an open line of communication and dual ownership in the process on instrument handling, there is typically a lower incidence of instrument damage and comingling of sets. The process/buy-in from both sides can take some time to establish if it is lacking, so beginning with pictures and calling OR and SPD staff to come and look at the sets in question will typically get staff moving in the right direction. Staff knowing that they are going to be held accountable for instrument preservation is the quickest way to drive compliance."

Jones recommends the CS/SPD implement the following practices to help communicate to the OR the importance of instrument preservation:

- A Six Sigma/Kaizen program that involves both the OR and CS/SPD working towards the same outlined goals.
- Allowing OR teams from each unit to rotate in CS/SPD for one month or a quarter in prep/pack; having them assemble the same sets they send to CS/SPD for reprocessing after their case.
- Require the OR and CS/SPD to develop a committee of stakeholders to meet weekly on instrument quality topics.

### Collaborate and communicate

Hadley suggests that regular meetings between members of both departments can provide a forum for giving and receiving information.

"Don't assume that OR staff know or understand the significance of proper instrument management," said Hadley. "These meetings can provide training, education and information that leads to a collaborative partnership. Ultimately, the goal of collaboration is the development and implementation of sustainable processes that leads to effective instrument preservation."

### Educate and train

Cochran recommends educating OR team members on the importance of instrument preservation and what a lack of preservation could lead to, such as pitting and damaged instruments.

"Demonstrate how to properly handle the instruments or have your repair vendor hold a training class," he said.

Cochran also advises the assessment of instrument and container quality on a regular basis to identify any changes that could be warning signs of larger issues, such as water quality or the need for preventative maintenance.

Anderson says while the CS/SPD can be involved in the education and training process of the OR, and device manufacturer representatives could also serve in the education capacity, the expectations should be set by CS/SPD and OR leadership. This kind of collaboration will help bridge even seemingly simple gaps, such as OR and CS/SPD using different names for the same instrument. These miscommunications lead to frustration and additional unneeded instrument handling and wear.

"It is important that these measures are valued not only by CS/SPD, but also by the OR leadership," said Anderson. "Once expectations and education has been implemented, auditing for performance should be done and reported at regular intervals. Reporting on audit data could be done at team huddles or on quality metric bulletin boards on a weekly or monthly basis. This data could also be used for performance reviews of individuals as well." HPN

*Second in a four-part series*

SPECIAL REPORT

# How high-quality medical supplies improve the patient experience of care

Whereas in the past, patient satisfaction was something that most health systems and hospitals hoped to deliver, today they have no choice but to improve their customers' experience. With the Centers for Medicare & Medicaid Services (CMS) providing reimbursements based on the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) patient satisfaction scores, and these scores readily available to healthcare consumers online, healthcare facilities are carefully analyzing what factors play into what patients perceive as a positive versus negative episode of care. That is why "improving the patient experience of care" is a key component of the Institute for Healthcare Improvement's (IHI) Triple Aim initiative.

Low-cost, high-volume medical supplies – from IV tubing to breathing masks – have a major impact on patient experience because they come into close and frequent contact with a high percentage of patients and are repeatedly replaced during the course of care. In the first article of this series, we provided an overview of how these supplies impact overall cost, quality and outcomes. In this article, we focus on the impact of medical supplies on patient satisfaction, providing specific examples of product design features that can improve comfort throughout the care continuum.

## The link between medical supplies, patient satisfaction

The HCAHPS survey is the first national, standardized, publicly-reported survey of patients' perspectives of hospital care. Launched in 2006, it is the leading tool for how CMS incentivizes hospitals for delivering superior patient experience in their facilities.

Patients and/or their family members complete the survey after discharge, and it is conceivable that their engagement with medical accessories while in the facility could impact how they respond to particular questions, especially as they relate to pain management, noise levels and sleep quality.

Unlike many pieces of capital equipment in a hospital, medical accessories often touch the patients' bodies or are in close proximity during their entire stay. With that level of intimacy, patients pay close attention to details. They recognize when a supply is causing pain, discomfort or noise, but even smell and other more nuanced details can often have an impact as well.

A device that is more comfortable and pleasing to a patient can have a direct impact on that patient's outcomes. For example, a poor-fitting pulse oximetry or ECG sensor might result in false alarms, which contribute to a nurse's alarm fatigue and increase the risk that nurses could ignore a real emergency if it occurs. In addition, if a product is known to cause discomfort and irritation, nurses, family members and other staff may disconnect the product or create "workarounds" that could unwittingly compromise care.

## Supplies designed with the patient in mind

Recognizing the link between high-quality medical supplies and high-quality care, manufacturers have been designing products to deliver a better patient experience. Here are just two examples of medical supplies with design features aimed at improving comfort, satisfaction and safety.

**Oxygen delivery systems:** Many patients find it unsettling to wear a breathing mask, let alone one that is ill-fitting, uncomfortable and irritating. Look for a manufacturer with a product line that features a variety of sizes and styles to fit different faces and therapy needs.

For patients who are at risk for pressure sore it is suggested rotating between different facial interface types. Select a manufacturer that has a wide range of mask types and contact surfaces, including nasal cannula offerings, to accommodate different facial and nasal features. Masks featuring air and gel cushioning are best for creating an effective and comfortable seal.

**Blood pressure cuffs:** Blood pressure cuffs are another example of a medical supply that is frequently used during the course of care but often overlooked in terms of patient satisfaction. Considering that a blood pressure cuff worn in an acute care environment may compress on a patient's arm hundreds of times all day and night before they are discharged, it is critical that the device be as comfortable as possible.

While most people are able to easily tolerate one-time use of a blood pressure cuff on their arm in a clinic, continuous monitoring of non-invasive blood pressure in an acute care setting demands that the cuffs fit extremely well to minimize patient discomfort and the need for nurses to adjust the items during the stay. The accuracy of a blood pressure reading is dependent on the cuff fitting correctly over the appropriate anatomical landmarks.

Select a manufacturer that offers a broad portfolio of both reusable and disposable blood pressure cuffs in a wide range of sizes, including neonate, pediatric and adult. Look for a more anatomical approach to cuff sizing for application on the upper arm and thigh to accommodate both the smallest and largest patients. Blood pressure cuffs should feature soft, rounded edges for increased comfort and easier handling, as well as hook-and-loop fastening to avoid skin contact, prevent irritation and improve flexibility. Furthermore, all cuffs should be DEHP-, latex-, and PVC-free.

For more information on how to improve patient comfort, satisfaction and safety through high-quality medical supplies and accessories, read this Frost & Sullivan white paper: Patient-Centric Care Models and Reimbursement Incentives Demand Hospitals Explore Every Opportunity to Improve the Experience, Even in Subtle Ways Achieving Triple Aim Goals with the Help of High-Quality, Innovative Medical Supplies. HPN

1. The IHI Triple Aim, http://www.ihi.org/engage/initiatives/TripleAim/Pages/default.aspx

*In subsequent articles in this series, we will provide tips for aligning supply purchasing with Triple Aim goals, next with the health of populations:*

### How high-quality medical supplies can help improve the health of populations

The term "population health" has grown in recognition since the Institute for Healthcare Improvement (IHI) included it as a key component of its Triple Aim initiative, calling on healthcare organizations to improve the health of populations in an effort to optimize health system performance...

*More in October*

# INSTRUMENTAL NEWS

## Low temperature sterilization methods can create a path for transmission of bacteria

Vaporized hydrogen peroxide (VHP) failed to completely sterilize surgical tools 76 percent of the time when the tools were soiled with salts or blood and not cleaned prior to sterilization, according to a study published in *Infection Control & Hospital Epidemiology*, the journal of the Society for Healthcare Epidemiology of America.

"While sterilization technology is capable of killing billions of microorganisms on instruments, some low temperature processes are unintentionally undermined when surgical instruments are improperly cleaned before sterilization," said William A. Rutala, PhD, MPH, director of the North Carolina Statewide Infection Control and Epidemiology Program.

Researchers at the University of North Carolina at Chapel Hill simulated the impact of proteins and salts left on surgical tools prior to sterilization to test the effectiveness of three low-temperature technologies, increasingly required for plastic tools, compared to steam sterilization.

Stainless steel test carriers, which simulated surgical tools, were soiled with salt and blood and contaminated with common bacteria found in healthcare settings – Pseudomonas aeruginosa, Escherichia coli, Staphylococcus aureus, vancomycin-resistant Enterococcus, Mycobacterium terrae, or spores of Bacillus atrophaeus, Geobacillus stearothermophilus, or Clostridioides difficile. The equipment was then sterilized with VHP, ethylene oxide (ETO), hydrogen peroxide gas plasma (HPGP), or steam.

VHP had the highest failure rate, 76.3 percent, with salt being the main component interfering with this technique. HPGP and ETO had failure rates of 1.9 percent. Steam sterilization, which is the most common technique used for sterilization of heat-resistant instruments, was the most effective and robust sterilization technology with no failures.

"If instruments are not properly cleaned prior to sterilization and then placed in a low-temperature sterilization technology such as vaporized hydrogen peroxide, there is a possibility of failure," Rutala said. "Effectively cleaning, removing visible soil and microbial contaminants from objects, must precede sterilization to ensure tools are thoroughly and optimally sterilized."

The authors noted that cleaning complex medical equipment, such as surgical instruments and endoscopes with hinges, sharp bends, and lumens, present a special challenge for cleaning and sterilization as could naturally occurring biofilm build-up on medical and surgical instruments.

# CS CONNECTION

# Planning for preference

*Successful surgical kit and tray management takes clarification, cooperation, orchestration*

*by Kara Nadeau*

One of the keys to success for an effective and safe surgical procedure is having the necessary instruments and supplies in the room for the surgeon and operating room (OR) team before the patient arrives. While on the surface this might seem like a simple concept, getting the right products into the right surgeon's hand at the right time requires a complex alignment of people, processes and information behind the scenes.

When a surgeon is missing an item, or has been given the wrong item, it can result in case delays and potentially patient harm. On the other hand, when staff members pick and deliver to the OR items that go unused, it adds time, labor and costs as soft supplies are returned to inventory and the central sterile/sterile processing department (CS/SPD) processes instruments that never touched the patient.

Procedural kit/tray planning can include some common challenges, but CS/SPD professionals, Supply Chain leaders and supplier executives share potential solutions to improve accuracy, efficiency and safety.

## Physician preference problem

Because they are the ones performing the procedures, it makes sense that the surgeons would dictate which products they use in the OR. But in a facility where numerous surgeons are requesting a wide range of suppliers and technologies based on their individual preferences, the procurement, processing, storage and management of these items can wreak havoc on supply chain, CS/SPD and OR staff alike.

"What instruments does the surgeon want? Hospitals get new surgeons on an ongoing basis and knowing what the surgeon wants is a continuous concern," said Mary K. Lane, MHA, CSPDM, CSPDS, CSPDT, MK Lane, SPD Consulting. "Some will only use specific brands, some want sets with their name on them, while others want everything except the kitchen sink in the tray, causing it to weigh greater than 25 pounds. Then there's the surgeon who can't make up his or her mind and wants to constantly change instrumentation."

*Mary K. Lane*

When physician preference alone drives tray and kit planning, a facility finds itself with various configurations for the same procedure, each based on an individual surgeon's needs. This level of variation not only increases cost for the organization and more work for those involved in managing these items (supply chain, CS/SPD and OR), but also increases the risk for error, particularly when it comes to picking and assembling supplies.

"Hospital protocol for surgical procedures can vary across facilities—as can tray preferences for surgeons within the same facility—leading to multiple surgical procedure tray configurations, in some cases for the same procedure," said Gary Rabinovich, Marketing Director, Procedural Kits & Trays, Halyard Global Products Division of Owens & Minor. "Carrying these redundant configurations creates inventory management inefficiencies and waste when protocols and preferences evolve."

## Get organized

According to Seth Hendee, CRCST, CIS, CHL, CFER, CSPDT, CFER, Clinical Education Coordinator, Healthmark Industries, organization and attention to detail are critical for CS/SPD professionals as they work to meet the needs of the OR.

"SPD is a dynamic workplace with many moving parts," said Hendee. "The staff must focus and have great attention to detail to properly inspect and package instruments. Organizing and standardizing the layout of instrument trays and providing staff with easy-to-follow set lists will greatly improve effective and efficient inspection. This, coupled with selecting the appropriate tray itself, will ensure they are stocked adequately and allow more focus on the important job of inspection.

"The same is true for procedures and requirements to properly sterilize and store instruments," Hendee added. "Giving thought to what is stored where (by

*Healthmark's Endo Dolly offers a single space to inspect and dry flexible endoscopes, perform cleaning verification and microbial surveillance.*

service for instance) and making sure staff members are organized while placing items into sterile storage will greatly impact how easily and efficiently they can be removed for use."

## Collaborate for change

Because the actions of the CS/SPD impact the OR, and vice versa, neither department can work in a silo as they address kit/tray planning challenges. Stakeholders from both teams must come together in a collaborative way to develop a solution that meets the needs of both departments.

"It's all about collaboration – both SPD and the OR play equally crucial roles," said Sami El-Saden, CEO and Chairman of the Board, Verrix. "Surgical trays containing excessive and large quantities of frequently unused instruments significantly impact SPD's ability to deliver on their commitments to the OR. Reprocessing unused inventory also drives up costs and consumes SPD technicians' most valuable resource: their focus. While a technician is engulfed with identifying, inspecting and packaging hundreds of extra instruments throughout the course of a shift, many other value-adding efforts are being compromised. By working together to right-size count sheets and surgeon preference cards and optimize standard versus specialty or emergency trays, SPD and OR can reestablish alignment and demonstrate their shared commitment to success."

*Sami El-Saden*

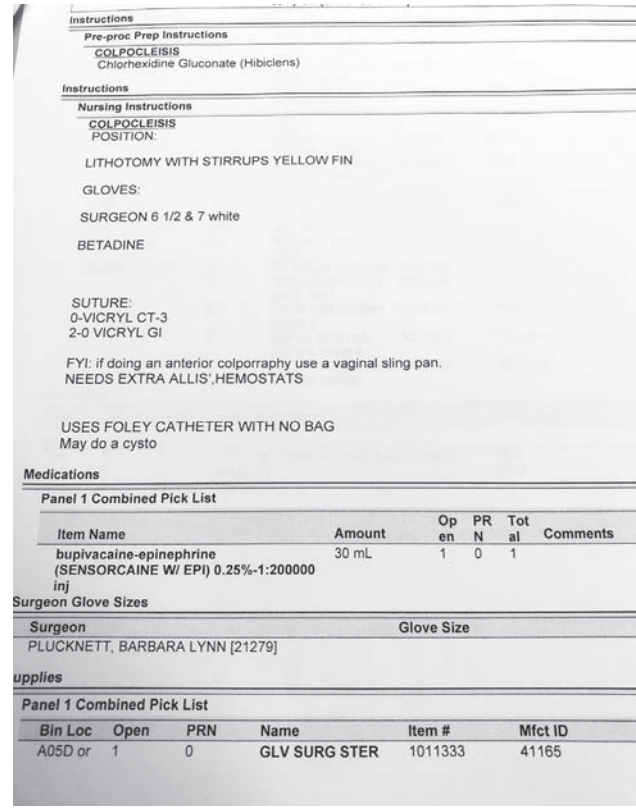
Lane explains how her department works very closely with OR clinical leaders, providing feedback to one another in real time to prevent "hiccups" in their day-to-day operations.

"At our daily huddles, we discuss in detail the concerns we may have with the next day's operating room schedule and, when possible, we rearrange the schedule," said Lane. "When that is not possible, we set up a plan to ensure the OR provides the CS/SPD trays requiring immediate turnover prior to the room being cleaned so we are able to expedite their reprocessing per the manufacturer's instructions for use (IFU). Having a good working relationship with the clinical leaders and the leaders in CS/SPD is critical to our daily operations, but when we are facing challenges associated with tray turnover, it requires us to be extra vigilant and very clear in our communications in order to prevent any delays."

*Halyard's customized CLEAR SEQUENCE Surgical Suture Kits can reduce time needed to gather and arrange supplies.*

Rabinovich says collaboration among the OR, supply chain and a healthcare organization's suppliers can help drive supply standardization, stating:

"Supply chain and OR clinical staff need to regularly collaborate and review existing surgical trays with their supplier to



Instructions
Pre-proc Prep Instructions
COLPOCLEISIS
Chlorhexidine Gluconate (Hibiclens)
Instructions
Nursing Instructions
COLPOCLEISIS
POSITION:
LITHOTOMY WITH STIRRUPS YELLOW FIN
GLOVES:
SURGEON 6 1/2 & 7 white
BETADINE
SUTURE:
0-VICRYL CT-3
2-0 VICRYL GI
FYI: if doing an anterior colporraphy use a vaginal sling pan.
NEEDS EXTRA ALLIS',HEMOSTATS
USES FOLEY CATHETER WITH NO BAG
May do a cysto
Medications
Panel 1 Combined Pick List

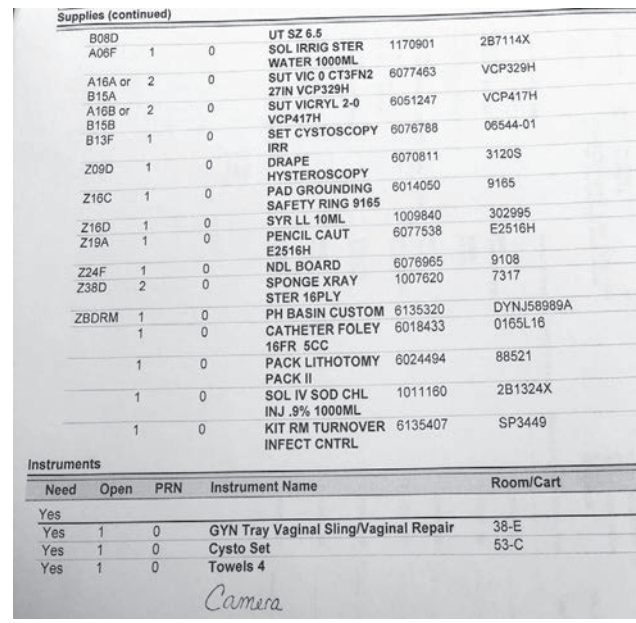
| Item Name | Amount | Open | PRN | Total | Comments |
|---|---|---|---|---|---|
| bupivacaine-epinephrine (SENSORCAINE W/ EPI) 0.25%-1:200000 inj | 30 mL | 1 | 0 | 1 | |

Surgeon Glove Sizes

| Surgeon | Glove Size |
|---|---|
| PLUCKNETT, BARBARA LYNN [21279] | |

upplies
Panel 1 Combined Pick List

| Bin Loc | Open | PRN | Name | Item # | Mfct ID |
|---|---|---|---|---|---|
| A05D or | 1 | 0 | GLV SURG STER | 1011333 | 41165 |



Supplies (continued)

| | | | | | |
|---|---|---|---|---|---|
| B08D A06F | 1 | 0 | UT SZ 6.5 SOL IRRIG STER WATER 1000ML | 1170901 | 2B7114X |
| A16A or B15A | 2 | 0 | SUT VIC 0 CT3FN2 27IN VCP329H | 6077463 | VCP329H |
| A16B or B15B | 2 | 0 | SUT VICRYL 2-0 VCP417H | 6051247 | VCP417H |
| B13F | 1 | 0 | SET CYSTOSCOPY IRR | 6076788 | 06544-01 |
| Z09D | 1 | 0 | DRAPE HYSTEROSCOPY | 6070811 | 3120S |
| Z16C | 1 | 0 | PAD GROUNDING SAFETY RING 9165 | 6014050 | 9165 |
| Z16D | 1 | 0 | SYR LL 10ML | 1009840 | 302995 |
| Z19A | 1 | 0 | PENCIL CAUT E2516H | 6077538 | E2516H |
| Z24F | 1 | 0 | NDL BOARD | 6076965 | 9108 |
| Z38D | 2 | 0 | SPONGE XRAY STER 16PLY | 1007620 | 7317 |
| ZBDRM | 1 | 0 | PH BASIN CUSTOM | 6135320 | DYNJ58989A |
| | 1 | 0 | CATHETER FOLEY 16FR 5CC | 6018433 | 0165L16 |
| | 1 | 0 | PACK LITHOTOMY PACK II | 6024494 | 88521 |
| | 1 | 0 | SOL IV SOD CHL INJ .9% 1000ML | 1011160 | 2B1324X |
| | 1 | 0 | KIT RM TURNOVER INFECT CNTRL | 6135407 | SP3449 |

Instruments

| Need | Open | PRN | Instrument Name | Room/Cart |
|---|---|---|---|---|
| Yes | | | | |
| Yes | 1 | 0 | GYN Tray Vaginal Sling/Vaginal Repair | 38-E |
| Yes | 1 | 0 | Cysto Set | 53-C |
| Yes | 1 | 0 | Towels 4 | |
| | | | Camera | |

Photo courtesy: Manny Rodriguez, Sterile Processing Manager, Geisinger CMC

***Sample Physician Preference Card***

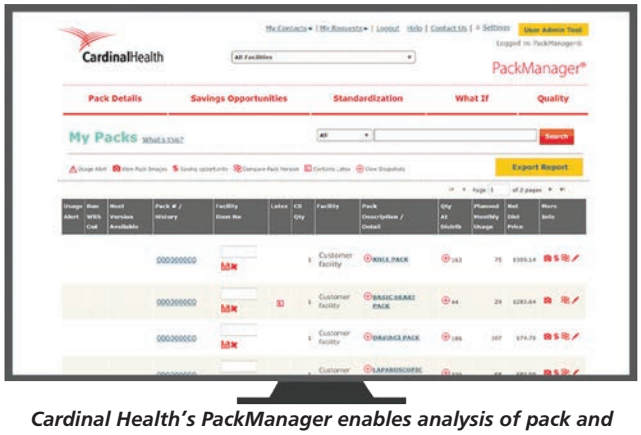
Page 28

identify opportunities for standardization. This can help reduce costs for the standardized, higher-volume procedure trays while also reducing inventory and obsolescence costs.

"Facilities should also consider surgical suture kits for complex procedures requiring a large number of sutures," Rabinovich added. "Using kits where sutures are pre-opened and arranged in the correct order can reduce the time typically required to gather, open and arrange supplies."

While most OR, CS/SPD and supply chain teams recognize that supply variation can negatively impact costs, workflow and patient care, many do not have accurate and complete data on product usage by surgeon and procedure to present a case for change.

Matt Bruggeman, Sr. Director, Presource Products & Services, Cardinal Health, stresses this need for a data-driven approach to procedural supply management, describing how it can help healthcare organizations maximize the value of their resources and spend.




*Cardinal Health's PackManager enables analysis of pack and component data to reveal standardization opportunities.*

"Effectively calibrating procedural supply spend and clinical utilization can be challenging, namely due to variation in products procured, pulled and used in surgical procedures," said Bruggeman. "Analytics can help spur necessary conversation between CS/SPD and OR staff by objectively presenting data and sparking dialog to prompt action. The output of these conversations can impact how a procedural supply chain is managed, driving new efficiencies and cost savings. For instance, thoughtfully reducing variation, using common products and kit componentry, enables providers to decrease SKU count, reduce inventory on the shelf, minimize waste and, most importantly, provide more time for patient care. This will be even more important as facilities continue to resume surgeries following the COVID-19 pandemic."

## Physician preference cards: The recipe for success

Physician preference cards are frequently likened to recipe cards because they contain the specific instruments and supplies each individual surgeon requires to perform a particular procedure. In theory, when the CS/SPD assembles instrument trays based on these cards, along with the required soft goods, the surgeon should have what he or she needs in the OR to perform the case.

In reality, healthcare organizations struggle to maintain preference card accuracy. The items that a surgeon specified for a procedure in the past may not be the same items he or she require today. As an organization negotiates new contracts and supply purchases, and brings new items into its facilities, OR staff

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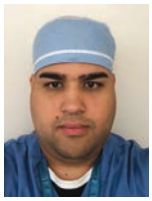
members must revisit preference cards with surgeons, but other priorities, most notably direct patient care, tend to get in the way. As surgeons leave a facility, and new ones join, the OR team must update their systems to reflect the preferences of these new surgeons, while removing those that are now obsolete. In some cases, the OR team continues to add items to a physician's preference card as they request new instruments and other supplies, but never deletes those no longer in use.

The CS/SPD team at Geisinger Community Medical Center (CMC) experienced the pain of inaccurate physician preference cards first hand, according to the hospital's Sterile Processing Manager Manny Rodriguez.



*Manny Rodriguez*

"My staff was using physician preference cards to prepare instruments and soft goods for cases, but we knew they were terrible," said Rodriguez. "They would pick the cases and send the items up to the OR and surgeons would say they didn't have what they needed. We would respond by saying they needed to fix their preference cards. As this went back and forth, we understood that we had a huge problem."

To address the issue, Rodriguez and his team first looked at which products hadn't been used in the past three years and made a list of those items segmented by surgical specialty (e.g. orthopedics, general surgery, ENT). They met with the OR manager, surgical services director and pod coordinators for the ORs to review the list. The pod coordinators took their designated lists and met with their teams to decide what they should keep or discard and where they could lower par levels for items they were not frequently used. Rodriguez's team reconvened with the OR team to create a general list of items to keep, discard or adjust and made changes accordingly.

To maintain physician preference card accuracy moving forward, CMC hired an individual solely responsible for correcting preference cards on a real-time basis. The OR keeps the empty packaging for supplies used in a case and the individual updates the preference card based on what the surgeon actually used, versus what he or she requested.

"I'm sure this project will save my staff members time and, if they are picking cases faster, I can reallocate their time to other projects," said Rodriguez.

Another organization that has addressed the challenges around physician preference cards is Mercy. The health system's perioperative team collaborated with Tecsys on a perpetual inventory management system in which clinical, operational and financial workflows are driven by preference cards.

"For me the real 'a ha' came in the form of looking at preference cards as an inventory management tool and not a 'card' that needs cleaning or scrubbing on a quarterly basis," said Betty Jo Rocchio, MS, BSN, CRNA, CENP, Chief Nursing Optimization Officer, Mercy. "I quickly realized that preference cards are really dynamic. If you manage them as the inventory management tool they are, you realize that they need to be cleaned once and optimized post every surgical case to maintain accuracy. The products used in surgery need to be managed in every case, and you need data about what occurs in that case to optimize them over time." HPN

*Betty Jo Rocchio*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## August 2020

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## LEARNING OBJECTIVES

1. *Describe the steam quality attributes necessary for effective steam sterilization.*
2. *Define "noncondensible gases" and understand how they may impact sterilization.*
3. *Discuss the importance of a proactive communication strategy between SPD and boiler plant personnel.*

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SELF-STUDY SERIES

# Steam requirements for sterile processing

*An overview of revisions to the ANSI/AAMI ST79 Standard**

*by Walt Deacon*

Sterile Processing is often regarded as the "front line" for fighting infections. Following proper protocols and standards is critical if we are to win that fight. This article will discuss recommendations in ANSI/AAMI ST79:2017 *Comprehensive guide to steam sterilization and sterility assurance in healthcare facilities*, while highlighting information important for Facilities and Design engineers to be aware of if they are to successfully support the Sterile Processing Department (SPD). Content for this article has been derived from multiple sources, including the Association for the Advancement of Medical Instrumentation (AAMI).

The ANSI/AAMI ST79 Standard is an all-encompassing standard, covering everything from steam conditions, airflow, temperatures, and water quality through the SPD. It offers guidelines and recommendations that "should" be followed. "Should" indicates the most suitable option among several possibilities. It may also suggest that a certain course of action is preferred but not necessarily required. Additionally, it may highlight when a certain possibility or course of action should be avoided, but is not prohibited.

## What makes steam used for sterilization so special?

It is important to remember that the last thing to touch an instrument or textile before it's used on a patient is steam. The Standard says there are two common sources for steam used in sterile processing: hospital steam boiler systems and self-contained electric boilers. In both cases, a treated water supply is necessary to remove total dissolved solids (TDS). Each system should be designed, monitored, and maintained to ensure that the quality, quantity, and purity of the steam provided are appropriate for effective sterile processing. With that standard in mind, you should reach out to your engineering staff and ask for a walkthrough of the boiler room, making sure they show you the solids measurement and controls.

## What are the parameters of steam quality?

The Standard describes steam quality as having three parameters: dryness, non-condensable ratio, and superheat. It offers acceptable levels for those three parameters and stresses the importance of assessment and documentation upon installation or relocation of the sterilizer, as well as after any change to the steam distribution lines or boiler supply water.

## What is dryness?

Steam dryness is a measure of how much liquid water is present in the flowing steam. It is expressed as a "dryness fraction," which is a percentage by weight. The Standard says steam dryness should be between 97% and 100%. This dryness fraction is measured at the inlet to the sterilizer. Most boiler plants do sampling of the steam near the boiler header to

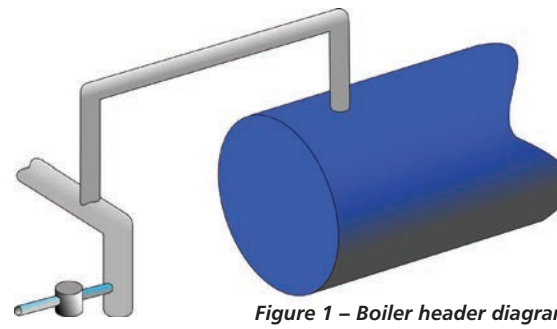

*Figure 1 – Boiler header diagram*

Figure 2 – Boiler header in a healthcare facility

Figure 4 Deaerator (DA) tank in boiler room

detect any boiler carryover. You may want to request that engineering take samples from behind the sterilizers.

A sample cooler in the boiler plant typically condenses some steam from the header or main boiler to measure solids and pH levels. If liquid is being discharged (carry-over) by the boiler, it shows up as a high solids concentration. The same measurement can also be used at the sterilizer. Liquid water at the sterilizer might be boiler carry-over but can also be condensate. Condensate is the equivalent of distilled water and will not have a high solids concentration.

## What if dryness is too low?

If too much liquid water flows into the sterilizer chamber, a *'wet load'* may result. Any liquid water present on or in the sterilized container can breed bacteria, becoming a threat to patient safety. If that happens, it must be reprocessed - an expensive and potentially hours-long procedure. Unfortunately, the problem is sometimes not discovered until containers are opened in the surgical suite. If that happens, reprocessing becomes an emergency and all other items processed with the wet load are recalled.

Unlike most other hospital processes (except humidification) the steam is injected directly into the sterilizer. This makes SPD one of the first departments to know if there is a steam system issue.

The sterilizer is designed to deal with soaking wet instruments. The steam is intended to condense on the instruments, creating the "time and temperature" required to achieve sterilization. The drying cycle is programmed to pull a vacuum, causing the condensation to return to steam. When there is too much "extra liquid" carried with the steam, the dry cycle can't handle it and a wet load would be the result.

## What are Non-Condensable Gases (NCGs)?

NCGs are defined as gases that cannot be liquefied by compression under the conditions of temperature and pressure used during the sterilization process. These gases are more commonly known as air, CO2, and O2.

*"Air"* refers to the atmospheric air that is introduced into the sterilizer chamber when the door is opened, or into the steam piping when the system is opened for maintenance. The steam system normally loses water over time due to leaks, humidification, and boiler blowdown (flushing the boiler). The system needs some fresh water to make up for these losses. Air is introduced into the system with this fresh water, as well as carbonates. Carbonates are the primary source of NCGs. When heated in the boiler, the carbonates ($CO_3$) break down, producing oxygen ($O_2$) and carbon dioxide ($CO_2$). These two gases can cause problems with corrosion. Boiler treatment adds chemicals to the system to head off the negative corrosive impacts of $CO_2$and $O_2$. The boiler water pre-heater or Deaerator (DA) Tank are designed to remove dissolved air and NCGs from the boiler feedwater.

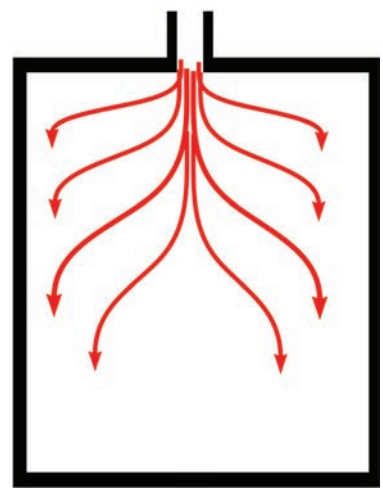

Figure 3 Steam Flow in the sterilizer

It is crucial to note the importance of daily testing to determine if there are problems with the DA tank. The Bowie-Dick test, which measures air removal, combined with the routine use of biological indicators (BIs) to confirm cycle lethality, will help identify failure in the steam system or the presence of NCGs. As a result of this continuous testing, SPD is one of the first areas to be aware of a steam system upset.

According to the Standard, the level of NCGs should be at a level (less than 3.5% v/v condensate) that will not impair steam penetration into sterilization loads.

## What if the NCG level is too high?

Air and NCGs can cause problems with the sterilization process in two ways; first, they lower steam temperature and second, they occupy space - insulating the instruments we are trying to heat and sterilize. The more air that is present, the harder it becomes to reach the 270°F temperature required by the sterilization cycle. During a sterilization cycle, steam flows towards the instruments, collapsing and condensing as it transfers heat to the instrument. The steam flow also pushes air and NCGs towards the instruments – much like wind pushing balloons towards the surface of the instrument. Since they don't condense, they can collect at the instrument surface, creating a heat transfer barrier.

## What is Superheat?

Superheat is steam that is hotter than saturation conditions, which prevents condensation. Superheat can be found in large campus systems or district (city) steam-by-design. It can also be the result of a large reduction in pressure through a pressure-reducing station. It is unlikely

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

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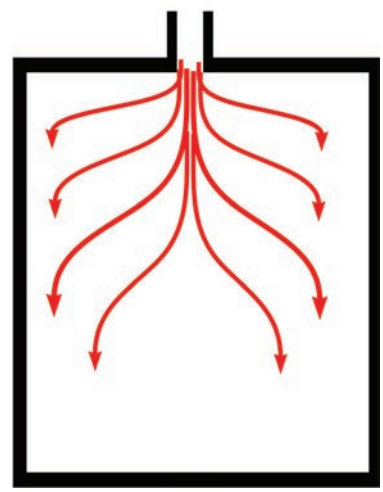

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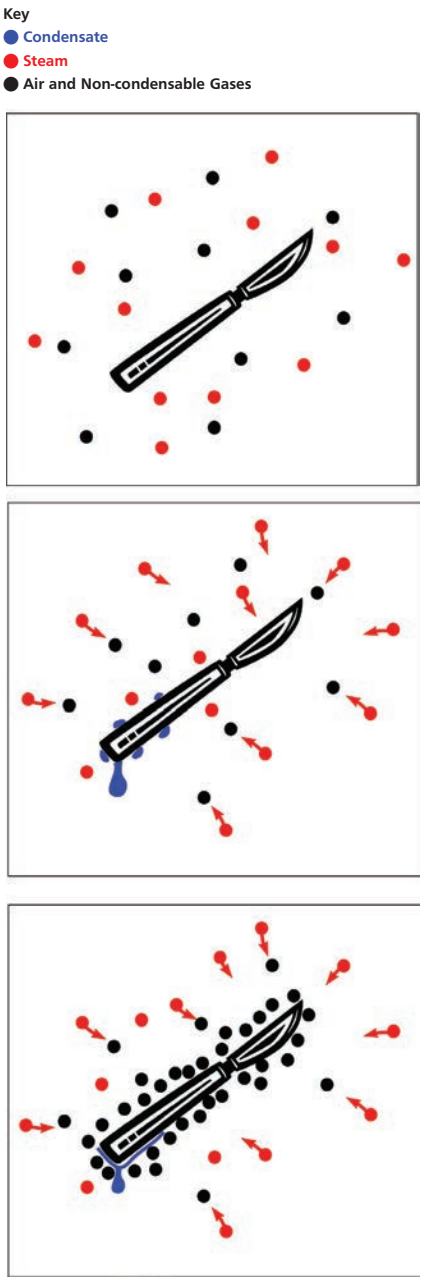


*Figure 5 – Steam pushes NCGs toward the instrument surface*

to be of significance under normal circumstances that you encounter in hospital steam distribution systems, but superheating might occur if the main steam supply pressure is unusually high (usually 250 psig or above). Superheated steam is an unsuitable medium for steam sterilization. The Standard calls for measurement of superheat of steam expressed as a temperature in degrees above saturation point. This value should be less than 25°C (77°F).

## What if superheat is too high?

Superheated steam can cause sterilization failure, scorching of textiles and paper, and rapid deterioration of rubber. Once again, the sterilization cycle creates wetness and superheat prevents wetness. The sterilizer chamber is usually jacketed with 30 psi steam, so having dry steam in the chamber is more like cooking pizza in an oven, as opposed to the desirable, wet conditions needed to prevent sterilization failure.

## What is dynamic pressure?

Sterilizer manufacturers specify a minimum pressure needed to operate and sterilize effectively. This is measured as steam pressure during peak steam flow. Total steam demand, and the corresponding capacity necessary to support that, should be determined so that the steam supply system can be designed and built to meet peak demands of the facility. You must be able to ensure that constant steam pressure is available at all times and under all conditions of steam demand to properly operate sterilizers.

## What if dynamic pressure is too low?

In our experience, there are two symptoms of low steam quantity. First, the sterilizer will sound alarms, especially door seal alarms found on newer sterilizers. Secondly, wet steam issues can happen sporadically, without rhyme or reason. High pressure drops are proportional to high velocity, causing condensate to flow past trap stations. Sudden pressure drops can impact trap performance and responsiveness. Consider asking that high quality gages be installed on the sterilizer steam supply, as well as a transducer, to constantly monitor steam pressure.

## What about treatment chemicals, especially amines?

Caution is advised when using amines for conditioning steam lines as the injection of amines directly into the sterile steam supply can create a staining issue, as well as high pH if the pump were to overdose the line. To avoid this, ask to see the amine injection point and request it not be directly in the SPD steam supply.

## Monitoring and alarms

Procedures should be in place for the preventive maintenance, repair, and monitoring of boilers and steam distribution lines that provide steam for sterile processing and for the documentation of corrective actions. This means that a pressure monitor is a good idea, and that traps and insulation on the sterile steam supply should be "hyper-managed." Most facilities check traps to find the energy loss created by leaking valves. For this reason, temperature monitoring of traps on the sterile steam supply is a good idea. A best practice is to ask that preventive maintenance be done monthly on the traps between the boilers and SPD. This maintenance can be as simple as regular surveying with an infrared thermometer gun.

In addition to testing the boiler water conductivity or total dissolved solids (TDS), the monitoring and testing program for boilers should generally include determination of:

a) Incoming water hardness, pH, iron content, and alkalinity;
b) Boiler water alkalinity and pH; and
c) Condensate return alkalinity, conductivity, sulfites, and pH.

In the battle against infections, the SPD can arm itself with ANSI/AAMI ST79:2017 , which suggests ways to ensure that the quality, quantity, and purity of the steam provided are appropriate for effective sterile processing. Key take-aways include:

1. *Conduct a steam quality validation whenever a sterilizer is relocated, steam piping changes are made to the sterile steam supply, or boiler water supply systems change. Values to be tested are dryness fraction, NCG level, and superheat.*
2. *Monitor steam pressures, trap operation on the sterile steam lines, and water chemistry (incoming, boiler, and condensate return) on a continuous basis.*
3. *Consider implementing a proactive communication strategy, so that it's the boiler plant calling SPD to notify them of a steam system upset, rather than the other way around.* HPN

***For reference:***

Association for the Advancement of Medical Instrumentation. Comprehensive guide to steam sterilization and sterility assurance in health care facilities. ANSI/AAMI ST79:2017. Arlington, VA. 2017

***For recommendation:***

Facilities and Design Engineers should review Section 3, Annex L (Steam quality) and Annex O (Moisture assessment)

*Walt Deacon is currently Vice President at Thermo Diagnostics and holds an MBA from Western Michigan University and a bachelor's degree in mechanical engineering from Purdue University. He is a voting member in multiple working groups at AAMI and a well-known speaker in topics related to steam sterilization systems.*

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# Steam requirements for sterile processing

## Circle the one correct answer:

1. **Superheated steam can be found in sterilizers with steam supply higher than 250 PSI.**
   A. True
   B. False
2. **One possible cause of stained packs can be attributed to the use of amines.**
   A. True
   B. False
3. **Steam sterilization inactivates microorganisms through condensation.**
   A. True
   B. False
4. **Adequate steam quality must have an almost perfect balance of the following elements: dryness, non-condensable ratio and superheat.**
   A. True
   B. False
5. **Steam parameters should be checked once a month.**
   A. True
   B. False
6. **Dryness can be defined as how much air can be found within the steam supply.**
   A. True
   B. False
7. **A consequence of low steam dryness can be the presence of wet loads.**
   A. True
   B. False
8. **Time and temperature during steam sterilization is created by 'soaking the instruments' with condensed steam.**
   A. True
   B. False
9. **Air is a good example of non-condensable gases.**
   A. True
   B. False
10. **The maximum percent of non-condensable gases in a load is 10%.**
    A. True
    B. False

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# IAHCSMM VIEWPOINT

# Checklists help facilities prepare for safer surgery rescheduling

*by David L. Taylor III, MSN, RN, CNOR*

As healthcare organizations navigate a COVID-19 world, many providers have lingering concerns about safety, not just for themselves but also for their patients and visitors. With hospitals and ambulatory surgery centers preparing to reopen surgical scheduling, it will be more important than ever to ensure proper protocols are in place to keep patients, visitors and employees safe.

Leaders who are directly involved in improving safety measures are essential for developing a safety culture. Leaders who are engaged and lead by example help employees feel safe when reporting errors or mistakes. Alternatively, leaders who fail to create an effective safety culture actually contribute to many of the adverse events that occur in healthcare organizations.[1]

With the resumption of elective surgeries, physicians, staff members, patients and visitors alike will have questions about infection prevention practices and the safety measures being implemented to help assure them that their surgical experience will not result in COVID-19 infection. Facilities' processes may look different now and may include a more proactive approach following their COVID-19-related closures; however, there are specific steps organizations can take to put everyone more at ease. Frequent, reassuring communication with all parties is crucial. Targeted checklists can also help aid preparation and ensure positive outcomes.

With the pandemic, spikes in infections and hospital admissions may continue, all while facilities aim to increase their surgery schedules to meet patient needs. Healthcare leaders must implement new protocols and processes to ensure patients and employees remain as safe as possible during this challenging time. Checklists like the ones below can help reach this critical goal. HPN


Reference

1. The Joint Commission. Sentinel Event Alert. The Essential Role of Leadership in Developing a Safety Culture. March 1, 2017.


## Address employee concerns & promote effective communication with all parties

- Continue following recommendations from the Centers for Disease Control and Prevention and remind all employees of the processes in place to help reduce the risks of acquiring COVID-19, such as using masks and maintaining social distancing outside the workplace.
- Evaluate and confirm that all education and staff competencies are up to date prior to restarting the surgical program. This may include mandatory training (e.g., Basic Life Support, Advanced Cardiovascular Life Support and Pediatric Advanced Life Support), fire- and disaster-based scenarios, and the relaying of other emergency preparedness plans.
- Thoroughly communicate with staff members any/all plans for reopening the elective surgery schedule.
- Remind employees of the needs of the community as they relate to surgical care. Make it clear what the surgical backlog looks like, what is realistic in regards to meeting those needs and the level of staff support that will be needed. *Note: Training and refamiliarization about specific specialties may be needed to ensure employees' ability to meet the needs during procedures.*
- Reestablish communication with physician offices. Employees in these offices may be new and unfamiliar with surgical preparation protocols or scheduling processes.
- Evaluate the list of surgical procedures that were canceled. Reprioritize those patients with physicians and begin rescheduling.
- Ensure adequate staffing levels to cover the variety of specialties being scheduled, and also communicate with anesthesiology to ensure they can handle the case volume.
- Communicate with rescheduled surgical patients and share what the healthcare organization is doing to ensure patient safety (e.g., extensive cleaning, proper use of personal protective equipment (PPE), specific training and safety measures that have been put into place to allow a safe/safer reopening).
- Verify that scheduled patients are safe to travel to/from appointments.

## Tackle key sterile processing-related tasks

- Inventory all instrumentation, equipment, implantable items (screws, plates, mesh, etc.). Also, inventory supplies (blue wrapper, filters, integrators, tape, etc.) to ensure adequate quantities are available to effectively reprocess instrumentation and equipment.
- Contact vendors specific to the specialties being performed in the facility and ensure they have the resources available to cover the scheduled cases.
- For washer-decontaminators and sterilizers that were taken offline during the COVID-19 shutdown (or for any other reason), contact the manufacturer(s) for guidance to ensure safe operation and proper performance. For guidance on steam quality issues, review ANSI/AAMI ST79:2017, Section 3.3.3, and AORN 2020 Guidelines for Sterilization (recommendation XI).
- Verify that Sterile Processing (SP) staffing will be adequate to cover longer workdays that will likely be needed to meet the higher surgical case volume. Note: If SP staff are managing PPE for the facility, there could be conflicts when prioritizing instrumentation or PPE. Prior to scheduling surgeries, ensure they have enough staff to fulfill both roles.
- Check all sterile packages and instrument trays for integrity and expiration dates.

## Take a closer look at logistics

- Reestablish any paused/canceled contracts (e.g., linen service, biohazard/waste management, etc.).
- Ensure there is an adequate supply of hand sanitizer, tissue and no-touch trash receptacles throughout the facility and in all patient care areas.
- Consider stationing an employee at all entrances to instruct everyone arriving to sanitize hands, wear a face mask and maintain social distancing.
- Post appropriate signage in all relevant areas communicating instructions for social distancing, appropriate wearing of masks, hand sanitation, etc.
- Inventory all supplies and medications, and check for outdated expiration dates. Communicate appropriate updates about all new protocols/processes with employees and patients/their family members.

## Implement pre-admission testing protocols

- Establish procedures to pre-screen patients through an approved portal/app, such as Zoom or Teams. Screening should include pre-established criteria, with added screening for fever, respiratory infections or possible COVID-19 exposure.
- Consider having patients sign appropriate documents electronically.
- Update arrival communication with patients and consider staggering arrival times to help enforce social distancing requirements while in the facility.
- Devise and confirm a thorough cleaning schedule of patient waiting areas.
- Complete a full inventory/evaluation of supplies, implants, medications and equipment.
- Communicate appropriate updates about all new protocols/processes with staff and patients.

# Mobile storage cart protection, antifatigue mat comfort, instrument engraver danger

*by Ray Taurasi, Principal, Healthcare CS Solutions.*

**Q** We are considering using open wire rack mobile storage carts in our OR to store various implants and sterile supplies. We will use clear plastic cart covers to protect the stored items. Do mobile supply carts present a greater risk for patient infection? Are there other issues or concerns we should consider prior to moving forward with our plan?

**A** I am unaware of any evidence that suggests that the use of mobile storage carts increases the risk of infection for patients. Such carts are widely used successfully in many facilities. When used for sterile items, you will want to select a cart that has smooth, nonabrasive shelves that will not damage the sterile packaging. For added protection, you might consider the use of shelf liners and/or container bins to hold the sterile packages safely, especially if open wire shelving is used.

If your carts are truly going be mobile, it's best to purchase carts with a solid bottom shelf. These will prevent dust and other particulate, stirred up by wheel motion and air currents in transit, from contaminating the sterile packages. You will want to establish the items that will be stored on the carts and provide a designated location with adequate space for each item. To minimize unnecessary handling, each location should be clearly labeled and organized.

**Q** A few of our sterile processing workstations require long periods of standing in place. We always have had soft floor mats at these stations for employee comfort. We have a new nurse manager who had the mats removed. He claimed they served no purpose, presented a safety hazard, were a source of contamination and were a violation of standards. Do you think it is acceptable to use these floor mats in the sterile processing department?

**A** There is no standard that prohibits the use of antifatigue mats in the sterile processing department or other work areas. They are even used frequently in operating rooms. There have been studies that have demonstrated the advantages of the use of antifatigue mats for employee comfort.

The flooring in the sterile processing area typically consists of very hard surfaces. As you noted, the tasks performed at some workstations entail long periods of static standing. The prolonged contact of the feet and hard flooring result in great discomfort and fatigue that can affect an individual's perfomance and productivity. Antifatigue mats provide a softer cushion between the floor and the feet, which can counter the adverse effects of static motion of lower extrimities. The design of an antifatigue mat creates a slight swaying motion of the body, which causes a slight activity of leg muscles and stimulates blood flow.

It of course is important to select a quality antifatigue mat appropriate for use in the healthcare setting. Features to consider include:

- Mat edges should be tapered to align with the floor to minimize the risk of tripping
- Mat top surface and undersurface should be skid- and slip-resistant
- Mat must be capable of frequent cleaning and disinfection
- Sterilizable mats are available
- Mat should be sized appropriatly for point of use

.

**Q** I work in a small rural hospital. We have two operating rooms, but only do elective surgery two days a week. Our staff rotates to other areas as needed and we all spend time in CSP. A manager from our parent hospital 110 miles away comes by every few months to check on things. She was rather upset because she noticed some of our instrument sets are engraved for identification. She insisted we stop this practice. We don't get new instruments very often, so what she saw has been around some time. We have an electric etching vibrating tool – why shouldn't we use it?

**A** Many years ago when I started my first job in the OR, we used such a device to engrave a lot of our surgical instruments and other items – this was common practice in many hospitals. We didn't know any better back then. We since have learned that the engraving process damages the hard, protective, chromium oxide layer of instruments and creates an area where bacteria can grow, and rust and corrosion can occur. It is also possible that the damaged surface of the instrument could chip, leaving foreign matter in a patient. The engraving can also create sharp areas on an instrument that can cause serious harm to the patient. So, it's time you get rid of that engraver. HPN

*Ray Taurasi is Principal, Healthcare CS Solutions. His healthcare career spans over three decades as an Administrator, Educator, Technologist and Consultant. He is a member of AORN, AHA, SGNA, AAMI and a past president of IAHCSMM. Taurasi has been a faculty member of numerous colleges teaching in the divisions of business administration and health sciences.*

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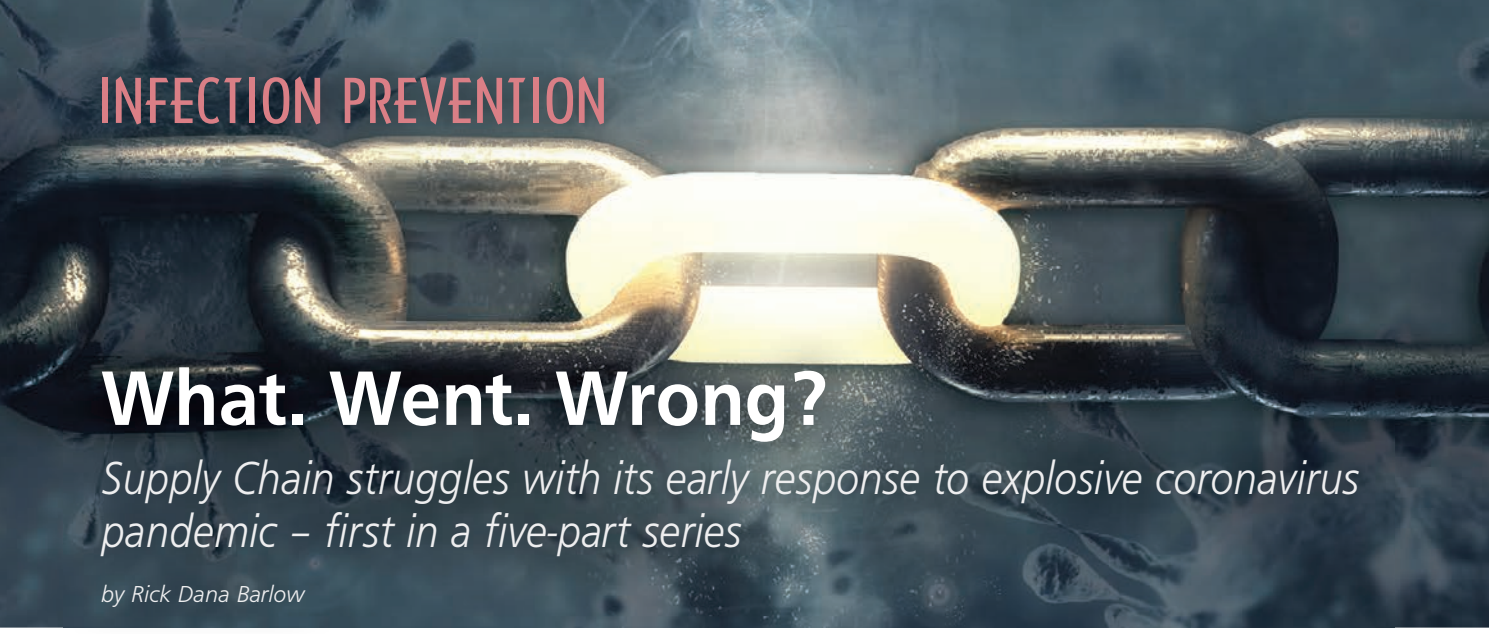

# What. Went. Wrong?

## *Supply Chain struggles with its early response to explosive coronavirus pandemic – first in a five-part series*

*by Rick Dana Barlow*

During a pandemic that motivates a panicked public to pursue recommended personal protective equipment (PPE) and disinfecting/sanitizing products in droves, Supply Chain professionals struggle to maintain optimal inventory levels within their healthcare organizations, recalling a pivotal scene in the 1998 Pixar film, "A Bug's Life."

While Supply Chain arguably resembled the organized and regimented ant colony to a degree, the public whipped into a buying frenzy by swarms of media reports and politician press conferences, acting more like the grasshopper clan.

The outcome? A grave situation that made traditional historical concerns about backorders, substitutions and recalls seem … quaint.

This has led and continues to lead Supply Chain and all of those they service – which, by the way, includes *everyone* – to ask some fundamental questions.

Where did we – and everything (presumably the supply chain) – go wrong? How did we – and everything – go south so quickly? Why? But perhaps the key concern lingering and looming on the minds of administrators and clinicians alike is what are we going to do about it so that this doesn't happen the next time?

What are some ways to maintain and buttress inventory levels, track what you store where and when it's used and then predict what's needed to satisfy demand?

And what should doctors, nurses and infection preventionists reasonably expect of Supply Chain and vice versa?

### System vs. Individual failure?

Clinical and Supply Chain experts wrestle with the notion that the COVID-19-induced product shortages resulted from a system failure or a radical behavior shift by consumers that reacted too desperately and too quickly for the system to catch up and keep pace.

Realistically, Janet Pate, JD, R.N., Nurse Consultant and Educator, Ruhof Corp., attributes the product shortages to a combination of both.

*Janet Pate*

"I have been a member of the [Alabama] State's Healthcare Coalition for many years. Emergency Management for pandemics and disasters is not a new topic of discussion," said Pate, who has extensive experience in infection prevention and environmental safety. "Plans, as well as disaster response, have been addressed for many years with meticulous attention given to stockpiles and mitigation for epidemics and natural disasters. It is very likely that people didn't expect that a pandemic with the magnitude of COVID-19 would ever occur. This pandemic has similar characteristics to SARS in the past, but the spread and lack of containment with COVID-19 has been much more widespread."

COVID-19 has proven to be nothing short of an administrative, clinical, financial and operational back-breaker that blew up existing modeling, based on the butterfly effect.

"Many hospitals and healthcare organizations have planned for natural disasters, but it is extremely impossible to plan for a pandemic such as COVID-19 and prevent critical [shortages]. "Stockpiles in the State Health Departments didn't have the capacity to address the needs. The national stockpile was also not prepared for this type of pandemic.

"Consumers received conflicting information from healthcare authorities regarding wearing masks and how to protect themselves," Pate continued. "This led to many consumers purchasing and stockpiling supplies and causing a shortage for others, or in contrast, disregarding the guidelines for social distancing and not wearing cloth masks. With the misinformation from authorities, coupled with panic, confusion and non-compliance has occurred."

Jimmy Chung, M.D., MBA, FACS, Associate Vice President, Perioperative Portfolio, Clinical Program Services, Providence St. Joseph Health, turns to organizational leadership to set the pace and tone.

*Jimmy Chung*

"I think it is a combination of all those things as well as a lack of leadership at critical decision points," Chung determined. "The system was underprepared for the pandemic, but also acted very slowly once it came. I don't think consumer behavior contributed as much, since consumers merely reacted to misinformation. The major product shortages experienced by healthcare organizations were PPE and N95 masks, and I don't believe the consumer reaction affected those as much. While masks were in huge demand later, the initial shortage of masks for healthcare providers was not caused by consumers buying them up from Home Depot. Another factor is the slow adoption of mask conservation policies and techniques that caused a lot of waste in the beginning. Clinical validation of appropriate PPE use was also slow, so there was a lot of overutilization in the beginning."

But Mark Campbell, FACHE, CMRP, Vice President, Supply Chain, Tampa General Hospital, points to several factors as shortage culprits.

"The global supply chain operates [just-in-time] with no room for spikes in demand," he said. "There is limited visibility into the product pipeline leading to panic buying

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and bidding wars over products that might not even be available. Providers don't keep adequate supplies on-hand due to financial and/or space constraints. There is limited planning and supply coordination from government leaders at all levels."

Data access, visibility and government assistance to a degree should make a difference, according to Campbell.

"Distributors need to open their inventory status and share real-time data," he insisted. "Most of the key PPE products should come through them. This may require higher inventory levels, and cost, for everyone. A locally-owned and managed pandemic supply should be maintained and supplemented with government supplies, where they are allocated based on patient demand."

Gary Fennessy, Senior Vice President and Chief Supply Chain Executive, Northwestern Memorial HealthCare, bristles at much of the criticism – and "Chicken Little" implications – of system and process failure, choosing to concentrate on the optimistic.


*Gary Fennessy*

"It is very easy for us to look back and start 'armchair quarterbacking what occurred related to product and equipment shortages associated with COVID-19," Fennessy said. "When asked, I believe as an industry we performed exceptionally well, and rather than focus on what went wrong I am trying to think about what we could do better. I believe overall the national health system responded about as well as it could have, given how quickly things changed and moved related to the virus.

"In my opinion, if two months before the pandemic hit many of us would have brought forward sourcing requests asking for approval to build stockpiles of PPE at 10 percent to 20 percent of what had been historical levels of activity, the response would have been, 'what data do you have to support that request?'" he continued. "[This], I believe, is the core issue going forward. We need to develop predictive tools for demand management that are bi-directional between providers and manufacturers that support anticipating demand well in advance of the crisis occurring. Further, those predictive tools have to be directionally accurate. Manufacturers need to trust them in order to anticipate demand and change production schedules."

## Collective confusion

Nancy Pakieser, Principal, Capstone 406 LLC, points to a ripple effect that expanded from China as the epicenter.


*Nancy Pakieser*

"The shortages were precipitated by the disruptions in manufacturing and logistic operations in China due to the initial coronavirus outbreak," she observed. "Given the global reliance on products or components from China, this ripple hit most product categories. Couple this with the increased global demand, the shortages were to be expected.

Decision making certainly experienced disruptions.

"Most healthcare providers have pandemic/emergency preparedness teams and plans," Pakieser continued. "The challenge is which event do you prepare for? Seasonal, environmental events such as a hurricane, manmade disasters like a terrorist attack or naturally-occurring diseases like a viral pandemic? The response and required supplies differ based on the emergency, so our provider colleagues can only prepare as well as their leadership teams direct. Add in the unexpected response of normal citizens exacerbating the supply-demand shortages and quickly consuming additional supplies. In my observation, it was not a system failure as much as an unprecedented spike in demand at a time that the entire system was being taxed. Globally, we needed more PPE than existed at the time."

Sourcing strategies that focused on the best price without much thought to sourcing redundancies in the event of a supply chain disruption offers another clue, deduces Joseph Jackson, Managing Director, Strategic Healthcare Services LLC, and a former hospital executive with more than 20 years experience in supply chain, operations and finance.


*Joseph Jackson*

"Many of these critical supplies are sold by only two or three companies, and the manufacturing is done in China," he indicated. "While this method does an excellent job in reducing costs, it does leave the supply chain in a precarious position in the event of a disruption. For example, before COVID-19, the U.S.-China trade dispute was a clear warning sign of potential disruption. While hospitals can continue to purchase these critical supplies from their current supplier, back-up plans are needed, such as creating a relationship with a secondary and/or non-traditional supplier based in the United States."

Jackson acknowledges that domestic production tends to translate to higher prices.

"I've talked to dozens of CFOs and Supply Chain leaders throughout the country, and all are willing to pay a bit more for supplies manufactured in the United States," he said. "To be clear, they don't necessarily want the U.S.-based manufacturer to be their primary supplier of these products. However, they would like to create a business relationship with a U.S. manufacturer to be their secondary supplier. The purchase requirements from a secondary supplier are much lower as compared to the primary supplier. CFOs feel they got hit hard financially on the 'gray' market for critical supplies. They feel it's worth paying a small premium to have a U.S.-based secondary supplier."

Domestic versus international production, in conjunction with hospitals and hospital systems working to cut costs and manufacturers and distributors streamlining processes to cut their own costs to control pricing, all converged as they collided with COVID-19, according to Cindy Juhas, Chief Strategy Officer, CME.


*Cindy Juhas*

"Because of the force of this pandemic, supply chains did not have enough supplies and equipment in inventory to equal the demand," she said. "The global economy hurt us a bit, too, in that many crucial items needed are made outside of the U.S. – mainly China. We didn't have a lot of leeway in finding other sources since not many remain in the U.S. I believe everyone in the supply chain is rethinking their emergency-preparedness plans and talking about solutions. I also believe that most health systems are rethinking everything, including architecture, equipment planning, telehealth, priorities and inventory and distributor partnerships to be able to better serve patients in the future."

Juhas agrees on more diversification of sources and less reliance on certain countries, knowing full well that a lot of products include components made in Asia, so backups for both products and their components should be prominent in any planning.

System failure for the entire end-to-end supply chain remains the verdict issued by Thomas Redding, Senior Managing Director, Healthcare Services, St. Onge Co.


*Thomas Redding*

"The surge in demand was clearly a driving force in upending the healthcare system chain," he noted. "With a high number of independent supply chains within the U.S. all vying for adequate supplies to support their 'potential' patient population, it became quickly apparent that health systems with more

sophisticated procurement practices were able to get ahead of the curve.

"Over the years, the healthcare supply chain has successfully utilized an allocation model to manage demand fluctuations more effectively for manufacturers/distributors to ensure the supply chain maintained its integrity," Redding continued. "With the most recent events, the industry turned into a free-for-all between all parties within the supply chain. There is a need for industry-wide marketplace to systemically monitor demand, sell and manage the flow of goods within the industry. A combination of local, regional and national sourcing strategies are critical to ensure future success in managing the flow of goods to the actual demand point(s)."

Healthcare Supply Chain leaders must embrace open-mindedness, recommends Thad MacKrell, CEO, PAR Excellence Systems Inc.


*Thad MacKrell*

"I believe that the product shortages, most specifically but not exclusively PPE SKUs, were the result of a lack of imagination in our industry," he noted. "PPE is inexpensive and doesn't take up much space relative to other medical supplies, but we collectively failed to imagine such tremendous, widespread demand until it was too late. Simply put, going forward disaster preparedness by providers and municipal planners needs to be expanded beyond terror, large accidents and extraordinary weather events to include pandemics. Providers need to stock for the anticipated supply needs of caregivers, and cities and communities need to stock for the general public."

## Crossroads of conflict

Two group purchasing organization executives classified the coronavirus pandemic as a "perfect storm" of "unprecedented demand."

"The COVID-19 pandemic presented the perfect storm for the healthcare industry, which has amplified the need for all healthcare leaders to look for ways to reduce costs due to lower payer reimbursements and the shift from fee-for-service to value-based care," observed Cathy Denning, R.N., Group Senior Vice President, Sourcing Operations, Analytics and Center of Excellence, Vizient Inc. "For at least the last decade and a half, Lean practices to streamline clinical processes, just-in-time (JIT) inventory and low unit of measure (LUM) to tightly manage inventories of medical supplies, have become common in hospitals across the country. In addition, over those last 15 years, more manufacturing was moved off shore as suppliers sought to lower prices and maintain margins as the industry looked for cost savings."


*Cathy Denning*

System, meet speedbump.

"Enter a novel virus that no one fully understood how it was transmitted, where it truly originated from and presented with a complicated mixture of symptoms in patients," Denning continued. "The one thing everyone agreed upon in the early stages was that, at a minimum it was transmitted by respiratory means. This meant that providers were facing an unknown, highly-contagious infection and a panicked public, while trying to determine a rational approach to product usage to deal with manufacturers who could not get their PPE products out of the Asian countries where they were manufactured due to sequestering for in-country use. Virtually overnight, in some of the hardest hit areas, hospitals had used 10 times their usual amount of PPE products. In the pre-COVID industry environment, there was simply no way that the suppliers or providers could have adequately planned for this unprecedented and ongoing spike in demand for PPE. The focus was not just on getting enough PPE supply, but also ensuring the PPE was being used in a judicious manner."

Denning concentrates on the use of N95 respirators before and after COVID-19 as one example.

"Given the significant barrier protection these respirators provide, their use was limited to surgeries and other high-risk cases before COVID-19," she indicated. "This meant a minimal number of staff were using them on daily basis on a limited number of patients. For the 3,000-plus hospitals we serve, this translated to an annual usage of about 10 million per year. During COVID-19, the use of these respirators expanded through many more patient interactions and many more staff using them each day. Early indications are that in the next 12 months we will see purchase volumes of these same respirators potentially go beyond one billion. This is a combination of the much broader and more frequent use combined with a need to maintain inventory in reserves in the case of another pandemic of this proportion."

The global spread of the coronavirus simply overwhelmed the supply chain, observed David Hargraves, Senior Vice President, Supply Chain, Premier Inc.

"COVID-19 introduced unprecedented demand in the global healthcare supply chain, the likes of which we have never seen before," he said. "Although we have faced isolated spot shortages before in the wake of natural disasters and other health crises in the past, no single state, country, government or manufacturer could have fully prepared for the staggering global surge in demand for critical supplies, in some cases up to 17 times, over a short period of time.

"COVID-19 underscored something that Premier has been saying for a very long time – that we need to be more thoughtful about our supply chain broadly," Hargraves continued. "When it works, no one thinks about it, but in an outbreak, vulnerabilities are on display. Sixty-eight percent of product disruptions occur due to poor demand-signaling. Premier has been a longstanding and passionate advocate for supply chain diversity and resiliency, taking lessons we've learned from disasters and past outbreaks such as Ebola and H1N1 to encourage manufacturers to think more expansively about how they source and supply."

Hargraves calls for "a more diversified supply chain and balance of the distribution of manufacturing to prevent overreliance on overseas regions for our healthcare."

Mark Wheeler, Director, Supply Chain Solutions, Zebra Technologies linked the shortages to a rapid shift in demand combined with assumptions about acceptable lead times and manufacturing flexibility that were built into the supply chain. "Many of these assumptions are now under review with the perspective of hindsight and a renewed appreciation for the importance of supply chain visibility and responsiveness," he added.

"In the early stages of the COVID-19 crisis, we saw surges in healthcare purchasing driven by expected demand and limited access to historical purchasing data for critical equipment parts and supplies," said David Brennan, Senior Vice President and Chief Product Officer, PartsSource. "Once customers started actively working with PartsSource to ask the right questions and look at the data we were making available to them, the panic was short-lived, and the resiliency of our customers' supply chain was revealed. PartsSource proactively worked with our suppliers and customers to tackle the immediate challenges and pivot to address future uncertainty." HPN

***Next in this series:***

### How might predictive modeling reshape supply chain?

More than six months from the emergence of the coronavirus pandemic and many observers, professionals and pundits in healthcare administration, clinical service, finance, operations and supply chain can coalesce on three central tenets...

Photo courtesty Kat Velez, LeeSar

PRODUCTS & SERVICES

# Steering supplies on a steady track to needed destinations

*by Ebony Smith*

The COVID-19 pandemic has penetrated communities like no other global public health crisis. Healthcare supply chain was driven to switch gears in operating in order to meet the dire need of supplies and equipment in the United States and worldwide.

Many hospitals and healthcare facilities have turned to new avenues of sourcing, storage and shipping of personal protective equipment (PPE), lab tests, medications, ventilators and other high-demand items needed to help protect healthcare workers and care for patients.

Jeff Schroeder, Director, Distribution Operations, LeeSar, expressed, "In 20-plus years of working in the medical supply distribution field, I've seen a number of crises come and go: swine flu, bird flu, Ebola and quite a few hurricanes. However, I've never seen anything as disruptive as COVID."

Freight, shipping and logistic companies have shifted their operations to help enhance safety throughout their workforce and for customers, ensure on-time deliveries of vital medical supplies and equipment, as well as prepare for future catastrophic events.

## Federal movement of product from overseas

The pandemic has caused significant challenges in manufacturing and shipping of critical supplies and equipment from China and other international areas. Production stalled, travel became restricted and shipping delayed. Federal agencies, such as the U.S. Food and Drug Administration (FDA) and the Federal Emergency Management Agency (FEMA), acted to expedite product movement to the U.S.

The FDA's Office of Regulatory Affairs (ORA) focuses on safety and efficacy of product coming into entry.

"Many of the medical products our healthcare workers and hospitals need to battle COVID-19 come from overseas, which makes the FDA's ORA work imperative to ensure products are moving as quickly as possible through the ports of entry," the FDA stated. "ORA protects the supply chain in two equally critical ways: first, we help ensure safe products are coming in and second, that illegal, dangerous and fraudulent products do not get into the country. The FDA is using the risk-ranking technology tool PREDICT on commercial shipments, numbering in the thousands, to release packages with accurate documentation and shipping contents in minutes rather than days."[1]

A national network and a FEMA taskforce concentrate on quick distribution of product to public and private sectors.

"To more effectively adjudicate resources throughout the nation and private industry, a National Resource Prioritization Cell was established to unify government and private industry prioritization recommendations which will inform federal, state and private sector operations," FEMA reported. "The Supply Chain Task Force is working with the major commercial distributors to facilitate the rapid distribution of critical resources in short supply to locations where they are needed most. Working together, we are able to efficiently distribute these vital resources to hospitals, nursing homes, long-term care facilities, prehospital medical services, state and local governments, and other facilities critical to caring for the American people during this pandemic."[2]

## Product procurement leads to sourcing alternatives

Hospitals and facilities have found themselves racing to locate and bring in the products they desperately need to care for patients.

"All hospitals scrambled to react to the pandemic and the forecasted COVID case volume and equipment needs," noted Sean O'Neill, Executive Vice President, St. Onge Company. "Some health systems scrambled to secure warehousing and stockpile the equipment but never saw the demand. Several systems were hit very hard and needed immediate help to source and acquire PPE."

*Sean O'Neill*

Steve W. Martin, Senior Vice President, Ryder Dedicated Transportation Solutions, points to helping customers manage the movement of high volumes of product.

"When the pandemic began to impact North America, we experienced an initial surge of volume with multiple healthcare customers, which was largely due to the uncertainty of what was to come," Martin expressed. "There were concerns about inventory and with some states closing their borders to interstate travel. In one instance, we had a major healthcare distributor shift large quantities of medical beds, wheelchairs, and walkers downstream in their supply chain. This created an initial surge of volume in the short term but has leveled off over the last several weeks. We were able to work with that customer to provide incremental capacity to meet the demand."

Diversification of sourcing through international, national and local channels is becoming more of an industry practice, adds Aimee Watson, St. Onge Company.

*Aimee Watson*

"Alternate sourcing strategies are now a real option for GPOs to consider," Watson emphasized. "Extended arms of healthcare organizations, such as AHRMM, have

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stepped up to provide alternatives and vet suppliers as quickly as possible. The idea that a hospital can only source from one or two vendors is now a thing of the past."

Gerry Romanelli, Chief Commercial Officer, TRIOSE, Inc., also sees this new direction of sourcing.

"We will need to help hospital procurement and supply chain teams at hospitals balance the benefit of single sourcing for savings versus using multiple sources to prevent from having all their eggs in one basket," Romanelli stressed.

*Gerry Romanelli*

Further, Don Carroll, Vice President, Business Development, Vantage Point Logistics (VPL), helps support hospital customers sourcing products from abroad.

"Because of shortages in the domestic supply chain, many of our customers have been forced to source products directly from overseas manufacturers," Carroll explained. "A significant issue with this approach is that buyers rarely have the logistics experience required to ensure the product is being delivered in a timely and cost-efficient manner. VPL has been working closely with these customers to arrange for international shipping, so they can stay focused on sourcing rather than logistics."

*Don Carroll*

## Adjusting workspaces, hours and practices

Ryder's Martin calls out several changes in their operations, including additional storage, hours, transportation and discounts.

"We have established pop-up warehousing to safely store essential supplies and have increased operating hours to handle the demand," Martin stated. "We've re-deployed trucks and drivers from non-essential businesses experiencing significant reductions in volume and production shutdowns to essential businesses experiencing extreme surges in demand. We pulled together a pop-up fleet of 60 of our rental vehicles from 45 different Ryder facilities in just a few short hours to support a customer that urgently needed to distribute critical medical supplies, pharmaceuticals to doctors' offices and pharmacies, assisted living facilities, and people's homes. Additionally, we have tapped Ryder's transportation management and freight brokerage divisions, where we leverage our buying power with thousands of reliable for-hire carriers on behalf of customers who are experiencing surges in volume and need the additional capacity.

"We've been working proactively with customers in retail pharmacy to shift their supply chain strategies and inventory placement to ensure they can make time-critical deliveries of medications and personal protective equipment. Ryder has also offered discounts on commercial rental rates to companies transporting medical supplies and other customers contributing to COVID-19 relief operations in the U.S. and Canada."

Tom Redding, St. Onge Company, points to additional storage needs of customers.

"Several clients have secured incremental warehouse space, redefining the mission of existing space, leasing space, or working with the commercial community to secure space to stockpile pandemic supplies. We had several clients looking to mitigate over-burdened facilities with COVID-deceased bodies. Changes to process and refrigerated shipping containers provided some capacity relief," Redding described.

*Tom Redding*

Increased immediate shipping needs have resulted in increased hours for its staff, says, VPL's Carroll.

"VPL is nimble enough to provide special services as needed by our customers," Carroll addressed. "The only real difference now is the increased volume of requests. With so many of our customers currently working with reduced staff, they are naturally working longer hours. We have significantly increased our afterhours coverage to ensure we are always available to take care of any last-minute challenges they might be facing."

LeeSar has enabled staff to assist each other and the business.

"Due to the pandemic, our fueling source has changed their hours of operation," LeeSar's Smith said. "Daytime drivers have been asked to ensure trucks have enough fuel for the evening and night shift drivers."

Schroeder of LeeSar, added, "If one department is slow there may be a chance to cross-train and shift that labor where it can be better utilized."

*Ryder fork-lift operator wearing PPE*

OptiFreight Logistics, a Cardinal Health company, made several adjustments to meet the speed and safety of facility- and home-based deliveries, explains Melissa Laber, general manager, OptiFreight Logistics.

"OptiFreight Logistics has seen an increased need for same-day movement of items such as PPE and diagnostic samples, to urgently get these critical shipments to the right sites of care," Laber shared. "Many providers have also launched same-day home delivery of home health supplies and medications, so that patients may avoid going out in public to pick up the items they need.

*Melissa Laber*

"Some of the ways we have been serving customers differently include:

- Bulk/large freight orders
- Domestic and international shipments of urgently needed supplies and equipment
- Establishing short-term courier routes to speed up delivery of lab tests
- Setting up shipments of prescriptions and home healthcare supplies direct to patient homes, where needed
- Adjusting delivery processes for our carriers and couriers to account for safety and physical distancing.

OptiFreight Logistics also recently launched a series of training videos for new shippers and program users. These videos on our customer website are very helpful during the pandemic when on-site trainings have not been possible."

Technology enabled MedSpeed to support the dynamic routing needs of its clients.

"The most important modification we made was to leverage technology to make our routing more dynamic," explained Jake Crampton, CEO, MedSpeed. "In the first few months of the pandemic, we had to make significant adjustments to account for facility closures. At the same time, each stop was taking longer because of health screenings. Then, as facilities resumed non-acute care, we had to alter the routes again and add resources. Each time, we leveraged our investments in analytics and tech to ensure we efficiently rebalanced the system."

*Jake Crampton*

## Enhancing safety

Ensuring the safety of staff at home, in the offices and on the road as well as customers is a shared priority among all companies. Many have instituted new or reinforced distancing, cleaning, PPE and other measures for added protection.

"Even though we are considered an essential business, we have made every effort to follow the CDC and state guidelines," TRIOSE, Inc.'s Romanelli reported. "When possible, we had employees work remotely. We re-arranged our offices to provide proper social distancing. We provide masks and require employees to wear outside of their personal workspaces and/or whenever in close proximity to others.

"We have disinfecting wipes/sprays stationed around common touch points (office equipment, break room) and have hired additional cleaning services who perform deep cleaning/disinfecting services nightly. Doors are propped to reduce the need to touch door handles. We discontinued visits to hospitals, visitors to the office, large group meetings and made use of video conferencing."

While St. Onge Company switched to total remote work.

"Our offices are closed and our staff is working 100% remotely," O'Neill said. "Meetings are facilitated through Zoom and conference calls. We have invested and created some processes and technology solutions to facilitate onsite operations discovery, data collection and analysis remotely."

In addition to social distancing, PPE and cleaning practices, Ryder put into place contact-free deliveries.

"Following CDC guidelines for social distancing, Ryder has instituted contactless service at its maintenance, fuel and rental truck locations, as well as for road call and mobile maintenance services," Martin stated. "Through these services, we work with customers to deliver the services they need while limiting contact to protect our customers, drivers, and our employees. Additionally, in the warehouses we manage, we continue to follow all global health authority guidelines for cleaning and disinfecting workspaces and common areas, as well as mandates for social distancing and the use of personal protective gear. We continue to secure disposable face masks, hand sanitizer, and cleaning supplies to our frontline locations throughout the Ryder network.

"OptiFreight Logistics also is working to adjust the protocol of deliveries.

"From a business perspective, we have seen health systems rapidly adapt their ground operations to serve more patients," Laber shared. "We have also been working with our national carriers to change how they enter buildings, where they pick up and drop off packages, scheduling contactless deliveries, etc., in an effort to ensure patient care and to keep delivery drivers safe."

## Overcoming obstacles and making on-time deliveries

The pandemic has driven home the disruption to healthcare supplies, public safety concerns and routines of shipping.

"With the onset of COVID and limited supplies of inventory, delays are inevitable, which creates the need to source alternatives," addressed Watson of St. Onge Company. "One consideration is how freight costs increase as hospitals begin acquiring supplies through non-distribution channels and rush orders. Costs increase on freight, minimum order fees, etc. In previous nationwide shortages (e.g., syringes and IV fluids), the need to go direct to the source was mission critical to survive."

Many companies have faced challenges with getting deliveries out quickly.

"In the beginning of COVID-19, we were extremely restricted regarding deliveries and entering certain offices and facilities," shared LeeSar's Bowden. "This initially posed a challenge we overcame to maintain fast delivery times, as some offices were not allowing entry and were requiring drivers' temperatures to be taken and other safety measures during deliveries.

"Also, in the beginning, we were immediately providing PPE and desperately needed supplies to multiple offices and locations, including member hospitals' patient-positive areas where individuals were

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being quarantined for the virus. We continue to deliver PPE, masks, hand sanitizers and other supplies as needed by all member hospitals, urgent care and medical offices."

Having a clear sight into shipment trajectory is a key factor to meeting urgent delivery needs.

"With shortages throughout the supply chain, it has become more important than ever for providers to have visibility into what product is coming into their facilities," VPL's Carroll noted. "Based on customer requests, VPL fast tracked the development of a "track and trace" technology solution that allows our customers to see when they will be receiving the vital product they have on order. As our customers work to ramp up elective procedures, having visibility into when they will receive product gives them time to work around shortages or delays in delivery."

A new RyderShare logistics platform recently rolled out to help gain a direct and ongoing look at shipments.

"RyderShare integrates multiple transportation and warehouse management systems into a single platform that enables everyone moving goods through a supply chain to easily see potential problems and inefficiencies, collaborate in real-time, and take immediate action to course-correct," Martin reported. "For example, we have a customer who experienced massive surges in volume during the pandemic, which meant they had to double the amount of loads going to nearly 4,000 locations across the U.S. Before RyderShare, it would have been impossible for them to calculate new delivery ETAs across the network, let alone communicate it out to their locations via phone and email. With RyderShare, the platform automatically calculated the new routes, and the locations could easily see the ETA of their deliveries and even follow their trucks in real-time."

Direct and ongoing communication with customers also helps keep shipping on track.

"Customers know they can call us for customized support anytime," OptiFreight Logistics' Laber stated. "In one recent situation, a large hospital had multiple ventilators they were donating on a "first come, first serve" basis. One of our customers in need of equipment contacted the onsite OptiFreight Logistics coordinator that evening at 8 p.m. and he quickly took action to arrange a courier service to arrive first thing the next morning. Thanks to the quick actions of our team, they were able to get the ventilators and deliver them to their regional locations in a matter of hours."

Meeting urgent shipping needs while maintaining lower costs requires special coordination.

"When the pandemic began, we were inundated with STAT orders each time a specimen was drawn or PPE needed to be repositioned," MedSpeed's Crampton explained. "Urgent movements such as these are costly, but amidst a pandemic our customers did not have time to think about efficiency. We quickly proposed a scheduled cadence for each customer that would save time for the clinical team, increase quality and keep costs down, all while meeting turnaround time requirements."

Still, Smith of LeeSar, sees a light ahead in the tunnel amid the crisis.

"We're finally putting more than PPE and toilet paper on the trucks," he noted. "Pickup and delivery of masks to be sterilized for frontline healthcare workers and providers kept two drivers busy seven days a week, but that program has come to an end and we're getting to a 'new normal.' More supplies are being ordered and delivered, and our drivers have been asked to do anything they can to speed up the process within their workday." **HPN**

*Visit https://hpnonline.com/21145730 for the sidebar and references.*


# Strategic partnership drives shipping savings

Now more than ever, healthcare facilities are under pressure to reduce costs so they can continue to provide high-quality care for their patients. An often overlooked, but sizeable area is shipping costs. Due to the complex transportation needs of healthcare, many of these facilities need help managing their shipments across multiple points of care and driving down costs. To accomplish this, facilities partner with OptiFreight® Logistics by Cardinal Health, an industry leader in comprehensive healthcare freight management.

## Monitoring shipping costs leads to sustainable savings

"In healthcare, we know that shipping parcels, packages and pallets is vital to running an organization and caring for patients," emphasized Melissa Laber, general manager, OptiFreight® Logistics. "Shipments must be managed properly to get to the right place on time, using the most cost-effective method. With OptiFreight® Logistics, inbound, outbound and intra-network shipments are optimized, which means when you use our program, you can be sure you are saving money on shipping."

*Melissa Laber*

OptiFreight® Logistics saves healthcare customers up to 30 to 50 percent on shipments* ordered direct from suppliers as well as outbound to other healthcare facilities or to patients. OptiFreight® Logistics takes a collaborative approach with its customers to manage more freight based on customization, optimization and innovation with an overall goal to create additional savings for customers.

"Today, we work with many carriers and couriers to serve our customers in regions all over the United States and Canada," Laber noted. "We have the largest, most experienced team in the industry, managing more than 7,000 suppliers and over 20 million shipments each year to more than 22,000 shipping locations*. Last year alone, we saved customers more than $537 million in shipping expenses*."

OptiFreight® Logistics is strengthened by the scale and supply chain expertise of Cardinal Health, a $130 billion global, integrated healthcare services and products company.

The OptiFreight® Logistics team uses robust data analytics to view transportation spend and identify cost-savings and efficiency opportunities. Its customer website provides shipping advice and videos to quickly and effectively train new users.

## Urgent transportation support during a global pandemic

Since the onset of the COVID-19 pandemic, OptiFreight® Logistics has helped many customers navigate the immediate demand for specialized transportation needs, such as international imports of personal protective equipment (PPE), bulk orders of necessary supplies and even additional local courier support around their hospital networks.

"The financial impact of the COVID-19 pandemic has placed increased pressure on hospitals to look for even more ways to save money," Laber said. "Our customers are facing urgent shipping needs and look to us for the solution. In a crisis like this, it really makes a difference to have a strategic, well-connected freight management team that is just one call away. I have been so impressed with our team and all our carriers that have shown dedication and innovation to quickly serve the needs of health systems during this challenging time."

## Evolving to meet the needs of the healthcare industry

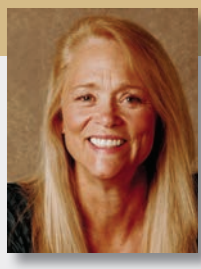
OptiFreight® Logistics is continuing to evolve to support the growing complexity of healthcare transportation. "There are many, many ways to optimize savings," says Laber. "We provide a total management approach inclusive of managing multi-carrier small parcel shipments, large freight, same-day and next-day deliveries via couriers and regional parcel carriers and customize a solution for each customer."

"Bringing new savings ideas to our customers is what gets us excited," says Laber. "Our team is located across the United States, working alongside customers to help with training, building efficiencies, scaling the program appropriately and improving processes."

OptiFreight® Logistics serves healthcare facilities across the continuum of care. Learn more at cardinalhealth.com/optifreight or email GMB-OptiFreight@cardinalhealth.com.

*Sponsored by Cardinal Health™ OptiFreight® Logistics*

*Based on internal OptiFreight® Logistics 2019 customer data



STANDARD PRACTICES

*Recall management in the era of COVID-19:*

# Anything but standard

*by Karen Conway, Vice President, Healthcare Value, GHX*

Even before COVID-19 hit the United States, resulting in hospitals scrambling for personal protective equipment (PPE), supply chains were already dealing with recalls of more than nine million surgical gowns and 2.5 million surgical packs that might contain some of the gowns in question. Now, experts are predicting a spike in recalls, in part as a result of steps taken by the U.S. Food and Drug Administration to help hospitals manage supply shortages. Compounding the problem is the way recalls are reported by manufacturers, distributors, third parties and the FDA itself.

In late May, Stericycle published its U.S. Recall Index for the first quarter of 2020 that predicted an increase in medical device recalls once "the FDA's emergency use authorizations [EUA] and enforcement discretion ends." Since the COVID-19 crisis began, the FDA has issued hundreds of EUAs allowing usage of certain products otherwise not approved for medical use or for the unapproved uses of otherwise approved products. One of the first COVID-related EUAs was for PPE; on March 3, the agency authorized emergency medical use of NIOSH "filtering facepiece respirators" that had otherwise only been approved for general (not medical) use. The FDA has also used its emergency powers to expedite review of new products, such as new diagnostic tests, and changes to the components used in previously approved products, such as ventilators, to meet the dramatic spikes in demand. In its report, Stericycle cited a research letter from JAMA Internal Medicine that found a positive correlation between the time it takes to approve a medical device and the time before it is recalled once placed on the market. As the Stericycle report authors noted: "We are predicting a surge in product recalls…once the economy and country get back to "normal."

But even in normal times, tracking and managing recalls is anything but standard practice. Last year, the AHRMM Learning UDI Community launched a UDI Impact on Recalls workgroup, which is exploring how the use of unique device identifiers (UDIs) can help providers more easily identify 1) if they have purchased any of the recalled products and/or 2) if they had used any of the recalled devices in patient care. When the final UDI rule was published in 2013, the economic analysis noted the potential for UDIs "to more effectively target and manage medical device recalls." Based on the compliance dates that have now passed, UDIs should be assigned and displayed on the labels of medical devices regardless of class (although the FDA says it does not intend to enforce UDI labelling requirements for Class I and non-classified – lowest risk – products before Sept. 24, 2022).

Unfortunately, the way the FDA has structured recall submissions and makes that data publicly available can make it hard for hospitals to effectively track and manage recalls. Information on recalls is posted on nine different portals, databases and websites, each of which reports the data slightly differently (See list below). There is also a delay between the time the FDA receives the recall submission and when it is made available to the public.

For example, the Stericycle report uses data from the FDA's weekly recall enforcement reports, which list the medical recalls posted during a given week. The problem is, the FDA may not post a recall for weeks, sometimes months, after the date it was initiated by the manufacturer. As such, a product may have been recalled but not yet included in the enforcement reports.

A recall for the same product can also be posted by multiple organizations: the manufacturer, the distributor, even a third party. As a result, a hospital could receive a recall notice from the manufacturer and start searching to see if it either bought or used the product. Then, when the distributor or another party submits a recall notice for the same product, the hospital may not realize it is the same recall and start the search all over again. In other cases, a recalled product may have been originally manufactured by one company (Company A), but with heightened merger and acquisition activity, it may now be owned by another manufacturer (Company B). If the "recalling organization" is listed as Company B, the hospital might mistakenly determine it did not buy any product from Company B and dismiss the recall notice, when it actually did buy the recalled product from Company A.

**Recall information can be found in multiple FDA locations:**

1. Medical Device Recall (Yearly Lists).
2. Medical Device Recall (Database).
3. OpenFDA
4. Compliance Dashboard
5. Enforcement Report
6. Recalls, Market Withdrawals and Safety Alerts
7. Additional Information about Recalls
8. Archive for Recalls, Market Withdrawals & Safety Alerts
9. FDA.gov Archive

A third problem – and perhaps the most significant – has to do with lack of standardization in how products are identified in recall notices. In the Regulatory Procedures Manual, the FDA instructs recalling organizations to "clearly identify the product(s)" and lists "Unique Device Identifier (if applicable)" as just one of the ways a product can be identified. As a result, there is no consistency in how recalling organizations identify products in recall notices, with many only using catalog or model numbers, which are not unique to a product and could by themselves be associated with numerous products from different manufacturers.

On the flip side, the exact same product may have a different proprietary number based on the vendor (e.g., distributor or manufacturer) that sold it, which is particularly problematic for hospitals that may have purchased the product from different distributors or direct from the manufacturer. Use of multiple vendors has been common during COVID-19 as hospitals have sought to address product shortages. Other manufacturers have used one or more of the UDI compliant codes, such as a GS1 Global Trade Item Number (GTIN) or HIBC Labeler Identification Code (LIC), but they do not always specify that the code is the UDI.

Finally, for those using the FDA's Recall Database search tool, there is only one field for product code, and without consistency, it is hard to know which code to use. If use of UDIs was the standard way to identify a product for multiple purposes, from purchase orders to recall notices, and by the multitude of organizations and functions, from supply chain to clinicians, distributors to manufacturers, it would be much easier to identify and remove the affected products from circulation. Most importantly, it

# STANDARD PRACTICES

would minimize the chances of a recalled product being used in patient care and help identify patients who may have been treated with a recalled device.

In future issues of *Standard Practices*, we will report on the additional findings and recommendations from the UDI Impact on Recalls work group. In the meantime, let me hear how you are managing recalls in the midst of COVID-19 and if and how you believe UDIs could make your life easier and healthcare safer. HPN

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# Trifecta of tribulations define The New Normal

*by Fred W. Crans, Healthcare Business Development Executive, St. Onge Co.*

Since the emergence of the coronavirus pandemic, there has been much discussion about what the "New Normal" will look like for the healthcare supply chain after the calamity ends. I asked a group of healthcare leaders what each thought it meant. One of them, Brian Keeley, CEO of Miami's Baptist Health South Florida, replied, "Fred, are you sure you don't mean the New Abnormal?"

Current events have given credence to Keeley's prophetic words. The COVID-19 virus continues to spread. The death of George Floyd revealed several things simmering just below the growing impatience and cultural irritation around self-quarantining, mask-wearing and business closures. Meanwhile, political unrest in China, where the origins of the coronavirus have been traced, continues to unsettle the supply chain in that China is where a preponderance of supplies are produced for the U.S. healthcare system.

Further, we cannot forget that tornado season, hurricane season and wildfire seasons co-exist. To add insult to injury: 2020 marks the year the locusts return as part of their 17-year cycle.

Still, elements of the "Old Normal" remain. Large systems continue to gobble up smaller community hospitals. Hospitals continue to fail. Those places that stay in business impose more stress on leaders to squeeze more and more juice (savings) out of a lemon that has little to give.

For you, Supply Chain leader, this is what the "New Normal" is going to look like – a series of immediate and existential challenges that you will have to deal with going forward, one followed by another, or worse yet, overlapped by two or more challenges occurring simultaneously.

Traditionally, the healthcare supply chain has been transactional in nature and notoriously understaffed. Strategic planning typically has not defined the norm. When crises strike, they are often resolved by heroic intervention. Add to that continual – if not continuous – pressure on Supply Chain leaders to identify and slash expenses to meet seemingly unrealistic savings goals often mandated arbitrarily by senior leadership.

Not only will this continue, but it likely will worsen as more organizations than hospitals and health systems will be threatened. Traditional distribution companies will find themselves threatened by systems choosing to do self-distribution and self-contracting, as well as by newer logistics entrants such as Amazon. GPOs will face the threat of losing members that choose to ink their own deals with manufacturers. They will do whatever they need to retain members, which means they may leverage senior leadership relationships against supply chain leaders, claiming to deliver considerable operational savings and costing good leaders their jobs.

The "New Normal" is going to be intense, and you, Supply Chain Leader, are going to be right in its crosshairs. What can you do to navigate your way through it? Here are some thoughts:

1. **Get out of the house.** The breadth of many supply chain leaders' vision does not extend very far beyond their own organization. That leaves them vulnerable and unprepared for what may come, tied to day-to-day activity and facing every threat or crisis with a frenetic response, then settling back in to the old routines until the next threat pops up. You need to be active and visible. You need to be aware of what is going on in (1) your organization, (2) your community, (3) your discipline and (4) the world.
2. **Form alliances.** The coronavirus pandemic has demonstrated that when crises arise, organizations that traditionally consider themselves to be competitors are often forced to become collaborators. Truth is, a better model of behavior is one in which "co-opetition" takes place. In short, it means "cooperate where you can and compete where you must." When you form alliances, your competitors become your peers, your professional colleagues. You learn together and make things better for everyone.
3. **Aggregate and use relevant data to support decision making.** One element of the "New Normal" that no one disputes is that decisions will be evidence-based and data-driven. Your challenge is to figure out what data sets are critically important to the operation of your supply chain, collect that data, aggregate it and use it for decision support as well as to monitor the ongoing effectiveness of your operation.
4. **Challenge the status quo.** Probably the single core characteristic of the "New Normal" is that there is no status quo. Change will be constant and liquid. Among the things you need to continually assess are:
   a. **Staffing.** Do you have the correct complement? Does your staff possess the necessary skills to perform their assigned functions? Have you been given enough resources to take care of the transactional duties and plan for the strategic ones? Do you have a succession plan? Have you established career paths for people?
   b. **Distribution.** Is your distribution strategy adequate for the present and flexible enough to handle the future needs? Can you handle disruptions caused by emergencies such as weather-related, pandemic-related, etc.? Do you have contingency plans in place? Do you know the costs/benefits of distribution options?
   c. **Inventory Management.** What is your inventory management strategy? What are the rationales behind your safety stock caches? Have you built in a plan for disruptions such as disasters and pandemics? Have you tested them in scenario analysis?
   d. **Sourcing.** Have you created a sourcing strategy (primary, secondary) for key items? Do you have a list of alternative suppliers in the event that the primary supplier(s) is/are unable to fulfill their obligations? Have you reviewed your existing agreements and revised/renewed them in order to be able to relate to disruptions or changes?

Address these areas and you'll weather the "New Normal." Just watch out for the locusts. HPN


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