

Items Transported in Pneumatic Tube Systems

Survey results from 200 hospital personnel





A pneumatic tube system (PTS) is an integral part of any large hospital. In fact, it's one of the top five systems within the facility according to Swisslog executives.¹

One common question among hospital employees is "what can I send in my tube system?" While Swisslog Healthcare Solutions is the market leader for hospital pneumatic tube systems, we don't recommend specific packaging or practices for transporting materials in a pneumatic tube system. Often, hospital policy dictates what may be sent through their tube system and how it should be packaged. Since Swisslog is not an expert in individual payloads, we leave the determination of what is appropriate to send in a pneumatic tube to the sender's discretion. In general, if the payload fits into the PTS carrier and does not exceed its weight limits, then it can be sent, providing that appropriate packaging measures are taken and facility-specific guidelines are followed.

To assist our customers and their employees in answering the question of what to send in their tube systems, we conduct a survey every few years to gather data about what customers are sending

in their TransLogic® Pneumatic Tube Systems. The following report summarizes those results.

In late 2013, Swisslog surveyed 200 customers currently using TransLogic Pneumatic Tube Systems to learn how their tube systems are being used – from who's using them, to what's being sent, to what measures they've taken to enhance their PTS system's performance and utility.

This report is broken down into the following five sections:

- Trends Impacting the Use of Automated Material Transport
- Departments Affected by the Changing Landscape
- Materials Being Transported Through the PTS
- PTS System Enhancements Being Implemented
- Expansion Plans to Address Healthcare Growth

Trends Impacting the Use of Automated Material Transport

The healthcare landscape is ever-changing, however, recent trends have dramatically impacted how hospitals operate, which in turn impacts the staff supporting the tube system. Swisslog has identified several key trends impacting healthcare, driving a renewed interest in improving patient satisfaction, increasing efficiencies and reducing spend.

Trend #1 – The Government's Role

Governments, insurance companies and providers are moving away from inputs – number of physicians, procedures and tests – to outputs – clinical outcomes, savings and patient satisfaction. This is a dramatic shift from the way things have been measured in the past and, as with any change, it's taking some getting used to.

Trend #2 – Patient-Centered Care

Today's patients expect a personalized experience from their healthcare provider that starts before they even walk through the door. Because patients have the ability to compare your hospital to the competition and make a choice based on how the hospital brand is perceived or reported on through published metrics, it's critical to offer a seamless experience to each patient from your website to wait times to easy access to medication.

Trend #3 – Increasing Healthcare Costs

The sum total of National Health Expenditures in the United States, while slowing in recent years, remains on an unsustainable trajectory. The inevitable conclusion is that the ability of hospital patients to pay for care is being outpaced by increases in the costs of that care.

Figure 1 source: Centers for Medicare and Medicaid Services, Office of the Actuary, National Health Statistics Group

Year	1990	2000	2010
Spending in US\$ (billions)	724	1,377	2,600
% increase since 1990	-	90%	259%

Trend #4 – Labor Shortages

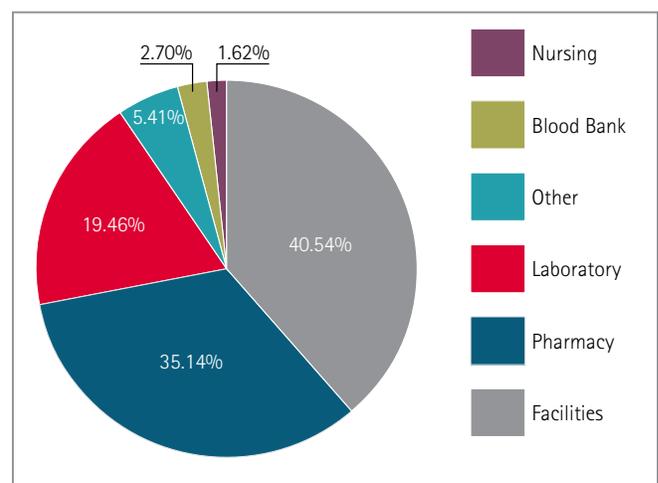
Current trends suggest that the usual strategy to meet increased demand for healthcare services—adding more caregivers—may not be viable in the future. A review of recent studies projects long-term shortages of U.S. physicians and nurses totaling 155,000 and 500,000 respectively, by the year 2025.²

Departments Affected by the Changing Landscape

In light of these trends, it's important to note which departments within the hospital are affected most by the changes. While some might argue that all hospital employees from the cleaning crew to the C-suite are impacted, it's the people on the front lines interacting with patients who will take the brunt of it.

Survey respondents were asked to identify which department they work in (some selected more than one) so we could gain a better understanding of who is interacting with the automated material transport system. As with most automation, a pneumatic tube system is designed to provide efficiencies and cost savings and allow staff to focus on higher value tasks than moving materials. With this and other automated systems in place, hospital personnel have the ability to spend more time on patient-facing activities and other day-to-day responsibilities.

Figure 2: Which department do you work in?



To no surprise, the facilities department was our number one survey respondent. While this team isn't the primary end user of the system, they are responsible for maintaining its functionality and uptime, making them privy to the materials being sent in the system and how well they are packaged. In a close second is the pharmacy department, handling mostly outbound transports. Our third highest respondent was lab, which primarily manages inbound material transport.

Materials Being Transported Through the PTS

Materials sent through a pneumatic tube system vary greatly, so it's helpful to see what other hospitals are sending safely and effectively as your facility evaluates its own system use. The following chart outlines what the survey respondents indicated their hospitals send through their PTS. You'll notice some items are more common—medication, specimens and IV bags being among the top items transported.

As part of this research process, Swisslog gathered contact information from survey respondents. For those individuals who are willing to serve as a reference, lists are compiled for the benefit of other Swisslog customers in the event they would like to speak with someone who sends specific items in their facility's tube system.

Figure 3: Which type(s) of controlled substances do you transport in the tube system?

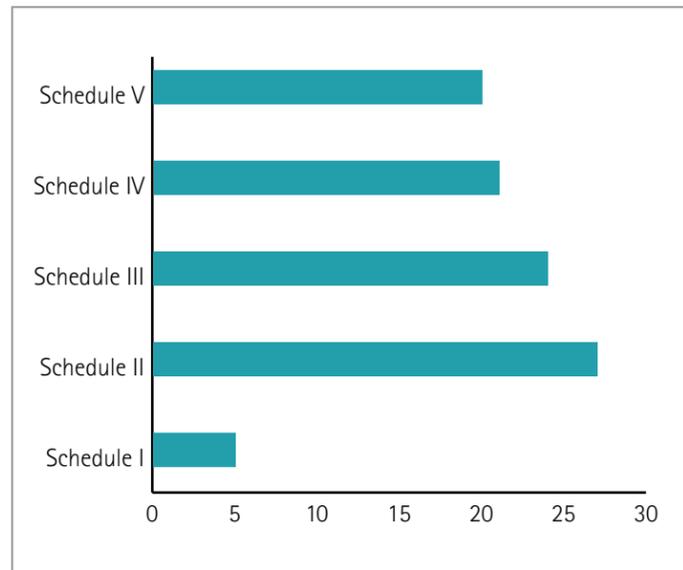
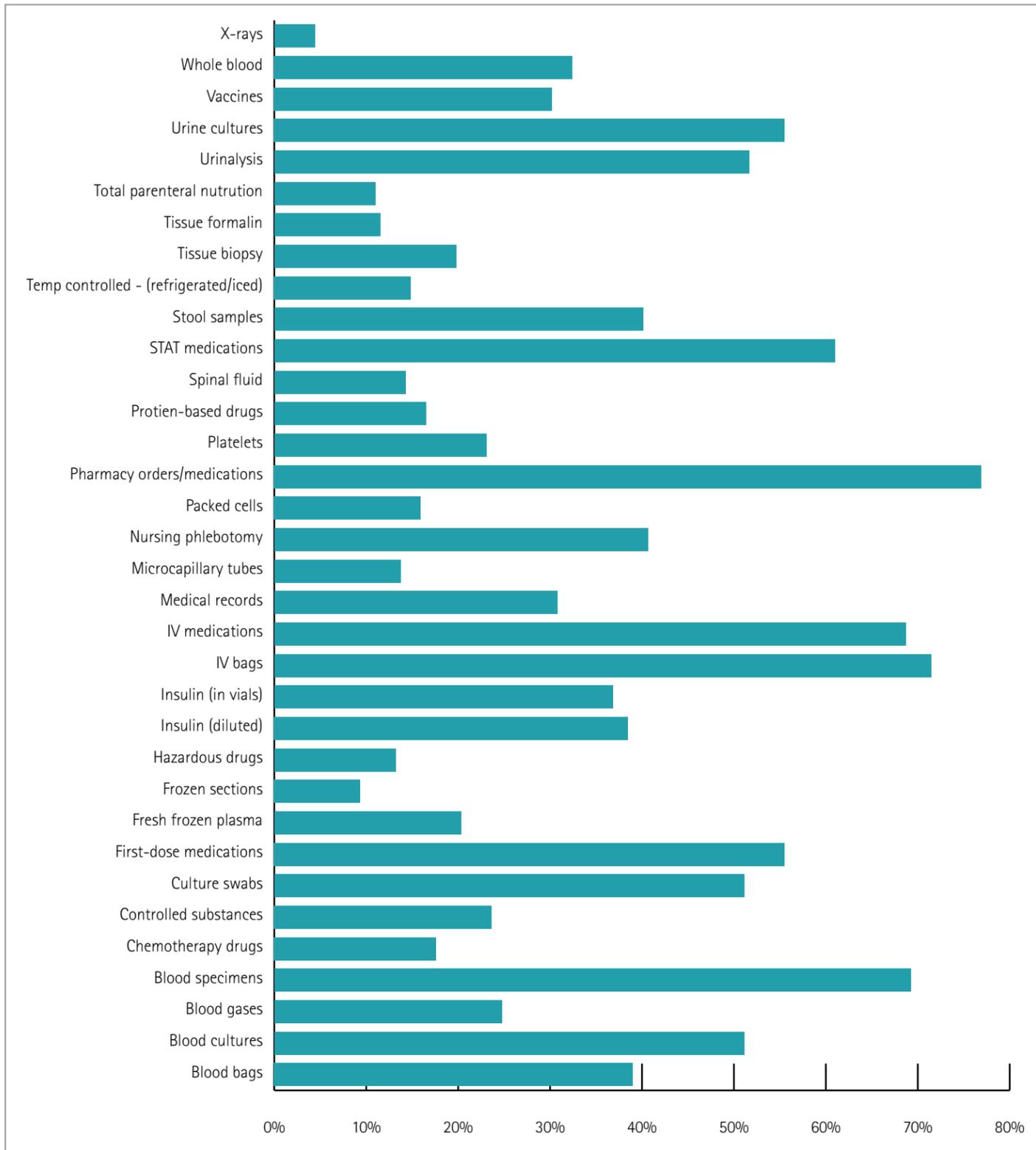


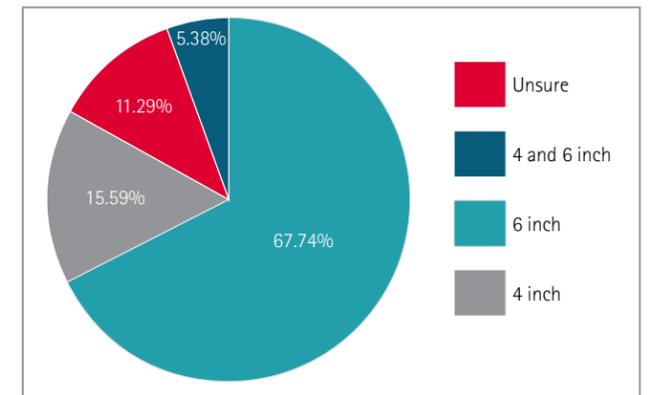
Figure 4: Which materials does your facility transport throughout its tube system?



PTS System Enhancements Being Implemented

The most common sizes of PTS tubing installed in the healthcare industry are four and six inches in diameter. The following chart illustrates that the majority of survey respondents have a six-inch PTS, which is the by far the most common choice for hospitals in the US.

Figure 5: Which size PTS does your facility have in place?



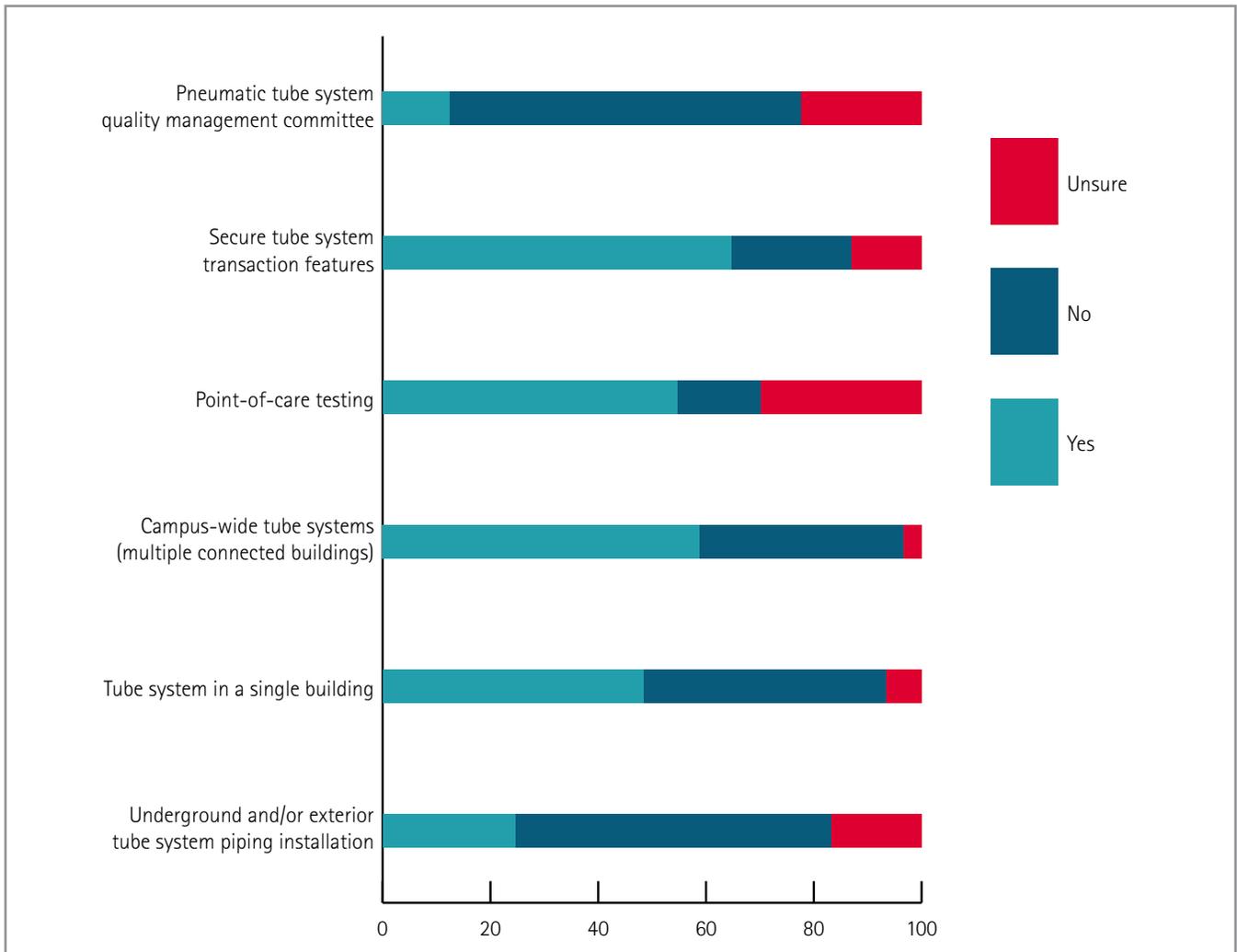
As with any large combined hardware and software infrastructure in a hospital, there are a variety of things to consider in selecting a PTS, from equipment add-ons to reporting to overall management either pre- or post-installation. For starters, as you can see in the following chart, a small number of survey respondents have a PTS management committee in place to ensure the best possible ongoing quality of their system after installation.

Additionally, chain of custody is a very important factor in a healthcare setting, so it's common for hospitals to incorporate – either during design or after the fact – security features into their tube system, allowing for enhanced patient safety and increased efficiency through tracking, monitoring and measurement of all transactions.

As you can see in the following chart, point-of-care testing (POC or bedside testing) is also something that is often related to tube system transport due to the time-sensitive nature of blood testing.

Lastly, tube system infrastructure considerations include individual or multiple buildings being connected by the tube system, as well as underground and/or exterior tube installation, which can be sensitive in certain regions. As an example, in California, a tube system must be designed to accommodate the potential for earthquakes.

Figure 6: Does your hospital have any of the following? (check all that apply)

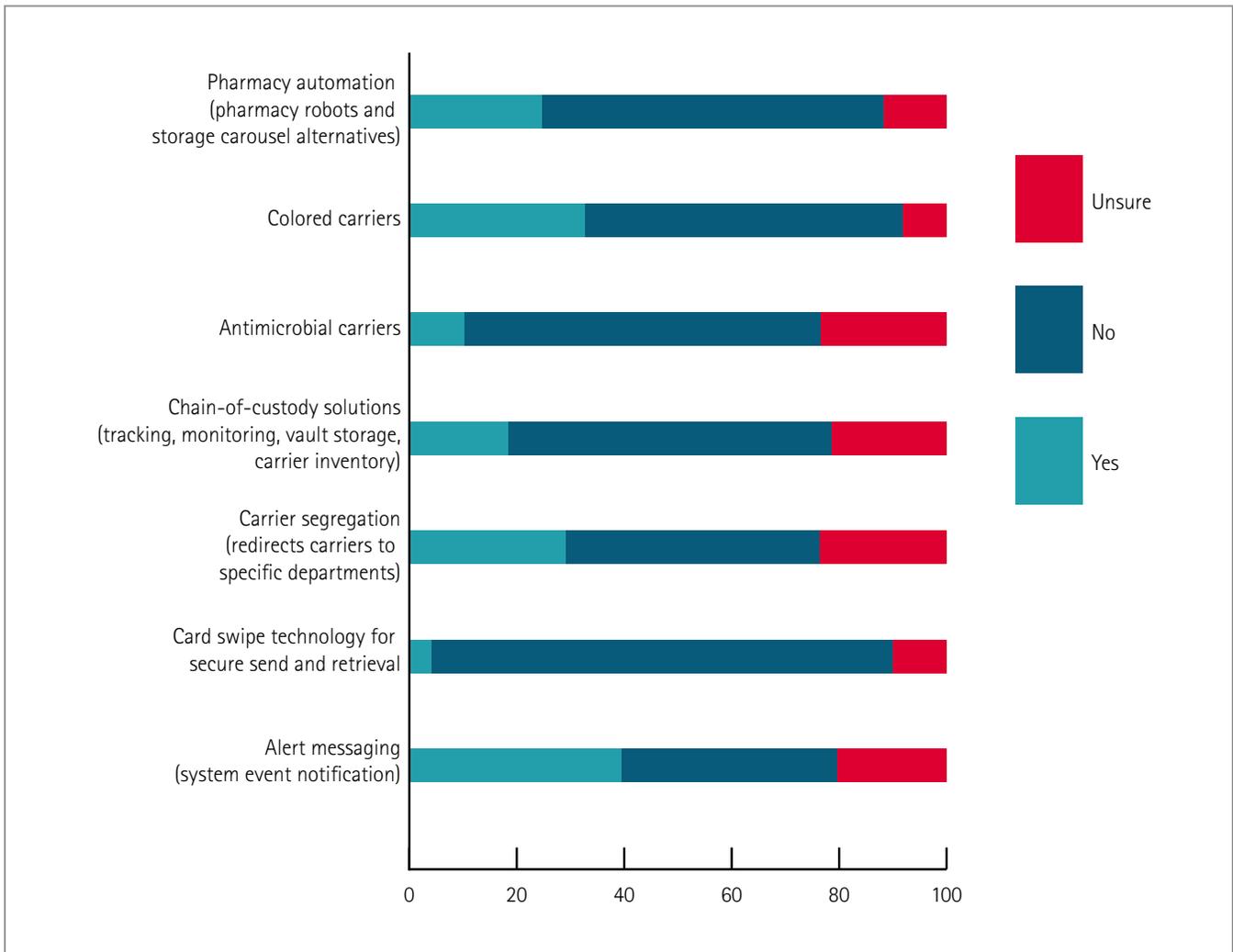


A pneumatic tube system goes hand in hand with other types of hospital automation, including autonomous mobile robots, automated guided vehicles and more department-specific types such as pharmacy automation, which is included in the chart below. As hospitals have seen the benefits stemming from automation and more specifically, the tube system, they have become more open to purchasing other types of automated solutions such as automated pharmacy storage systems, inventory management software, etc. This is a common trend in hospitals that we expect to increase over the coming years due to the previously stated market-facing trends.

Chain of custody, as mentioned above, comes with a long list of optional solutions in the form of carrier tracking, monitoring and inventory management, card access security, PTS station access doors, secure storage of carriers, alert messaging and more. The following chart indicates the interest the healthcare industry is taking to incorporate these impactful components.

Colored carriers are often used to help hospital departments identify which carrier belongs to which function, while other hospitals prefer to color code their carriers by contents (blood is sent in a red carrier and so forth). Along the same lines are antimicrobial carriers, which assist with infection control and overall sanitation of the PTS and hospital.

Figure 7: Does your facility use any of the following pneumatic tube system capabilities?



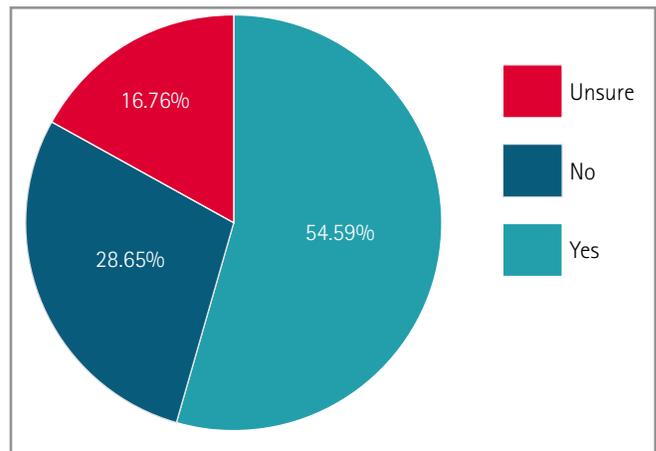
Expansion Plans to Address Healthcare Growth

The Affordable Care Act, or Obamacare, has helped nearly 10 million people to secure new health insurance with over four percent of all Americans having health insurance for the first time, according to a Gallup poll.³

With the influx of more insured Americans, comes the need for more staff. A June 2014 Forbes article stated that since the Affordable Care Act was signed into law in March 2010, the healthcare industry has gained nearly 1 million jobs – according to Bureau of Labor Statistics estimates released on Friday.⁴

What does this all mean? Existing hospitals will be expanding. New hospitals will be built. Our survey respondents were asked if their facility was planning any new buildings, expansions or renovations, and more than half said yes, which helps to validate this prediction.

Figure 8: Is your hospital planning any new buildings, expansions or renovations?



Summary

While it's easy to view the current healthcare trends as challenges, we also have the ability to look to at them as opportunities for growth, better patient care and process improvements across the entire healthcare system.

By utilizing a hospital's existing systems smarter – through implementation of automation, security and tracking, measurement reporting and other enhancements – the healthcare industry has the means to achieve additional resource flexibility, increased efficiencies, more intelligent workflows and reduced costs.

About the Survey

The Pneumatic Tube System Items Transported Survey was conducted with US customers in November 2013 over a one month period. Responses were received from 200 hospital personnel, of which 50 percent said they would be willing to serve as a reference for specific items transported in a pneumatic tube system. Respondents consisted of PTS end users or maintenance personnel with titles, including: manager, director and VP level executives from facilities, pharmacy, laboratory, nursing and blood bank, as well as a few individuals from other functions.

The survey and analysis were conducted by Swisslog Healthcare Solutions. If you have questions about the survey results or contents of this report, please contact healthcare.us@swisslog.com.

Swisslog Healthcare Solutions

Swisslog Healthcare Solutions (HCS) is the leading supplier of automation and software solutions for material transport and medication management in healthcare facilities. Swisslog has installed facility-wide and pharmacy automation systems in more than 3,000 hospitals worldwide, including more than 2,000 in North America. Denver-based Swisslog Healthcare Solutions offers total system design, manufacturing, installation and customer support – providing an integrated solution for lean workflow and operations that enhances information access, patient safety and cost efficiency.

About Swisslog

Swisslog is a global provider of integrated logistics solutions for warehouses, distribution centers and hospitals. Its comprehensive services portfolio ranges from building complex warehouses and distribution centers to implementing proprietary software for intra-company and hospital logistics solutions.

Swisslog solutions optimize customers' production, logistics and distribution processes in order to increase flexibility, responsiveness and quality of service while minimizing logistics costs. With years of experience in the development and implementation of integrated logistics solutions, Swisslog provides the expertise that customers in more than 50 countries rely on.

Headquartered in Buchs/Aarau, Switzerland, Swisslog currently employs over 2,000 staff in 20 countries worldwide. The group's parent company, Swisslog Holding AG, is listed on the SIX Swiss Exchange (security number: 1232462, Telekurs: SLOG, Reuters: SLOG.S). For more information, visit www.swisslog.com.

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- ¹ President, Swisslog HCS North America in internal Swisslog correspondence on healthcare automation. 2014.
 - ² U.S. Healthcare Workforce Shortages: Caregivers," Computer Sciences Corporation, Healthcare Group, May 2013.
 - ³ Brown, Alyssa. "Is the Affordable Care Act Working?" Gallup.com. April 16, 2014.
 - ⁴ Diamond, D. (n.d.). "Since Obamacare Passed 50 Months Ago, Healthcare Has Gained Almost 1 Million Jobs." Forbes.com. Retrieved June 6, 2014.

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