



Could Specimen Storage Outsourcing Help Labs Compete in Today's Cost Conscious Environment?

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Table Of Contents

INTRODUCTION.....	3
RESEARCH METHODOLOGY	4
RESULTS AND CONSIDERATIONS	5
Today's Top Challenges	5
Current Storage Practices	5
Perception of In-house and Outsourced Storage	6
In-house Perceptions.....	7
Outsourcing Perceptions	7
Needs Gap Analysis.....	8
Unmet Needs: Areas of Opportunity.....	9
PERCEPTIONS VS. FINDINGS	10
Ease of Locating Specimens.....	10
Temperature & Humidity Control	10
Reducing Risk of Litigation for Inadequately Preserved Specimens	11
Productivity of Staff Managing Specimens.....	11
Cost of Storage	11
CONSIDERATIONS FOR OUTSOURCING.....	12
CONCLUSIONS.....	13
APPENDIX.....	14
TABLE 1: Participant and Lab Characteristics	14
ABOUT G2 INTELLIGENCE	16
ABOUT IRON MOUNTAIN INCORPORATED	16
ABOUT THE AUTHOR	16

INTRODUCTION

It is no secret that many labs are facing challenges today due to healthcare reform. Labs must add value, cut costs, and improve their work quality;¹ all while receiving reduced reimbursement for tests compared to prior years.² At the same time, Electronic Health Record (EHR) initiatives that focus on reducing duplicity and inappropriate test usage are lowering test volume and revenues.^{3,4}

To cope with reduced reimbursement and budget constraints, many labs have implemented strategies to reduce costs. Specifically, labs are reducing spending, consolidating across sites to improve efficiencies, and focusing on core lab capabilities while outsourcing less routine or less profitable tests. In addition, labs are expanding to generate new volume and revenue by adding and maintaining clients by offering new tests.^{1,2} Some are even providing payers with test utilization management services where they are paid to optimize clinicians' ordering of molecular or other expensive laboratory tests.^{1,2} Unfortunately, even with these strategies in place, many labs are still struggling to achieve their pre-healthcare reform profit levels.²

Faced with similar challenges, healthcare providers and hospitals have successfully cut costs by utilizing partnerships with outside vendors for services that are not available, efficient, or effective to keep in-house.⁵ Following the lead of healthcare providers and hospitals, labs are beginning to re-evaluate current internal functions to identify opportunities to generate incremental savings, efficiencies, or productivity. One area for potential improved efficiency is the outsourcing of specimen storage.

The primary purpose of this study is to explore the current state of specimen storage and analyze whether a shift to an outsourced model would enable labs to better support more critical internal initiatives. This paper will also identify dominate specimen storage practices, explore the perceived value of in-house and outsourced models and provide insight as to how the benefits of each model are expected to evolve in the future. As a result, lab professionals will be able to analyze their own programs to successfully identify areas to increase efficiency reduce costs, and more strategically allocate resources.

¹ Where Smart Labs Go When the Money's Gone. O'Reilly, K. CAP TODAY. August 18, 2014.

² U.S. Clinical Laboratory and Pathology Testing 2013-2015: Market Analysis, Trends, and Forecasts. G2 Intelligence.

³ Benefits of switching to an electronic health record (EHR). Excerpt from: Hoyt R and Yoshihashi A. Health Informatics: Practical Guide for Healthcare and Information Technology Professionals (Sixth Edition). July 2014.

⁴ Evidence on the Costs and Benefits of Health Information Technology. Available at: <http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/91xx/doc9168/maintext.3.1.shtml>

⁵ Expertise on Call. Kutscher B. Modern Healthcare. September 1, 2012.

RESEARCH METHODOLOGY

Through a series of qualitative interviews with Lab Managers, Directors, and Vice Presidents based in the United States, we sought to provide a better understanding of the deficiencies, and advantages of current storage practices as well as the perceptions of in-house storage alternatives, such as slide and block specimen storage outsourcing. As this is the first research study on this topic, we felt a qualitative sample was adequate to develop a baseline understanding, but further research with larger sample sizes would be beneficial to further build on our findings. Participants were screened on their title and experience level with slide and block specimen storage for their lab. They were not screened on whether they use in-house or outsourced storage solutions. These interviews were conducted in a blinded fashion, meaning that the participants did not know Iron Mountain was the sponsor of the research and participant identity was not shared with Iron Mountain. Table 1 within the appendix includes key participant and lab characteristics.

Two separate interviews were also conducted with two hospital-based customers of Iron Mountain to understand the challenges they faced prior to outsourcing, the model they are currently using for specimen storage, as well as the results they have experienced as a result of outsourcing with Iron Mountain. The results of these two case study interviews are included as call-outs throughout this paper and are referred to as Hospital A and Hospital B. Hospital A is a world-renowned healthcare provider in the northeast and Hospital B is a large teaching hospital located the midwest.

RESULTS AND CONSIDERATIONS

Today's Top Challenges

When asked about the top 3 lab challenges, a wide-range of issues were mentioned by participants. This reflects the full scope of complexity associated with managing a labs today. However, a few trends emerged, including:

1. Staffing; recruitment and retention
2. Reimbursement
3. Fragmented or limited storage space and a growing trend towards consolidation
4. Budget constraints

Those that did not mention specimen storage in an unaided fashion were directly probed on the issue. A few of those participants agree specimen storage is a challenge they face, but not among the top three issues faced today. Of those that did not say space was an issue, most currently use some outsourced storage solution.

At face value, this is not surprising given storage is viewed as a foundational, support function and a requirement of the business, rather than a strategic overarching goal. However, one needs to consider whether there is a direct correlation between current storage practices and a laboratory's ability to enable and support mission critical functions. And, if so, which storage model proves more beneficial – in-house or outsourced?

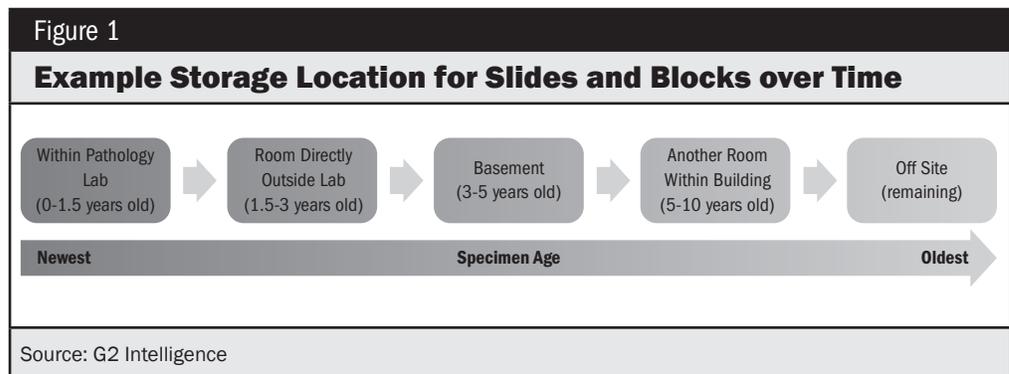
Current Storage Practices

Lab storage practices vary greatly across organizations, however in-house is the dominant approach used today. Specifically, most labs do not outsource specimen storage but rather commonly have fragmented practices in place. Slides and blocks are stored across many rooms within organizations (both on-site and off-site) and the storage location is often dependent on the age of the slides/blocks. This results in frequent specimen movement. An example of this is displayed in Figure 1. In-house storage that spans across multiple rooms and/or organizations can be complex and lead to increased workloads for lab employees.

Real World Experiences:

Prior to engaging with Iron Mountain, a storage and information management vendor, **Hospital A** was using a fragmented internal storage approach where all specimens were stored on-site across multiple rooms and facilities. The hospital began investigating outsourced storage solutions as it became more and more difficult to find new storage space for the increasing inventory size, especially as space within the institution was seen as premium, even if not in an ideal location. Also, the lab's budget was being hit with rising costs associated with the rental of space across the institutions. Lastly, the lab found it difficult to ensure that the multiple spaces used for storage maintained the correct temperature-controls based on industry requirements.

Alternatively, prior to working with Iron Mountain, **Hospital B** stored their slide and block specimens and their radiology films within a hospital-owned offsite warehouse. One FTE worked within the warehouse and was responsible for pulling and filing all slides, blocks and radiology films. While convenient at times, having only one FTE available posed a problem due to the large volume of research specimens required.



In many climates, specimen storage requires rigorous controls, such as temperature and humidity monitoring, and even pest prevention. Nearly all participants indicate their lab uses temperature control (air conditioning) to preserve specimens that are stored on-site. Some also have humidity and fire prevention controls in place, though humidity is seldom viewed as essential. Yet, these controls become increasingly difficult to monitor and enforce as storage demands grow and space becomes increasingly fragmented.

For most labs, specimen volumes are increasing year over year and all report their labs keep specimens for the most stringent regulatory requirements (often around 20 years) and a few keep them indefinitely. Therefore, the issue of lab storage is further compounded due to large yearly volumes and an expansive number of legacy slides and blocks that must be maintained. The fragmented model becomes ever more complex to manage and draining in terms of internal resources (i.e. space, FTEs, and budget).

Perception of In-house and Outsourced Storage

This section explores perceptions of in-house and outsourced specimen storage models. The perceived strengths and weaknesses for in-house and outsourced storage can be found in Figure 2.

Figure 2		
Perceived Strengths and Weaknesses of In-House and Outsourced Specimen Storage		
	Strengths	Weaknesses
In-House	<ul style="list-style-type: none"> Convenient Easy Pulling specimens is fast In my lab's control Ability to train the staff who manage storage Less direct cost associated with storage 	<ul style="list-style-type: none"> Lack of adequate space Lab or hospital would like to use current storage space for different reason Uses valuable staff time to pull and move
Outsourced	<ul style="list-style-type: none"> No longer have to worry about space Can use internal space for a revenue-generating purpose rather than storage Reduced burden on staff to find specimens - specimens can be accessed "stat" Less expensive than using prime space within hospital 	<ul style="list-style-type: none"> Expensive Longer turn-around time to pull slides/blocks vs. in-house Concern about security Outside of lab's control
Source: G2 Intelligence		

In-house Perceptions

- **Strengths:** Overall, participants are most likely to say that convenience and speed of pulling specimens are the key strengths of in-house storage. A few also mention that in-house is superior as they feel the storage is in their control and they can train the staff who manage slides and blocks.
- **Weaknesses:** On the other hand, the key weakness of in-house storage relates to space; both lack of adequate space and that the hospital or lab would like to use the storage space for a different reason. Another weakness of in-house storage is that it uses valuable staff time inefficiently, for both pulling specimens, searching for misfiled specimens, and moving them around to different rooms.

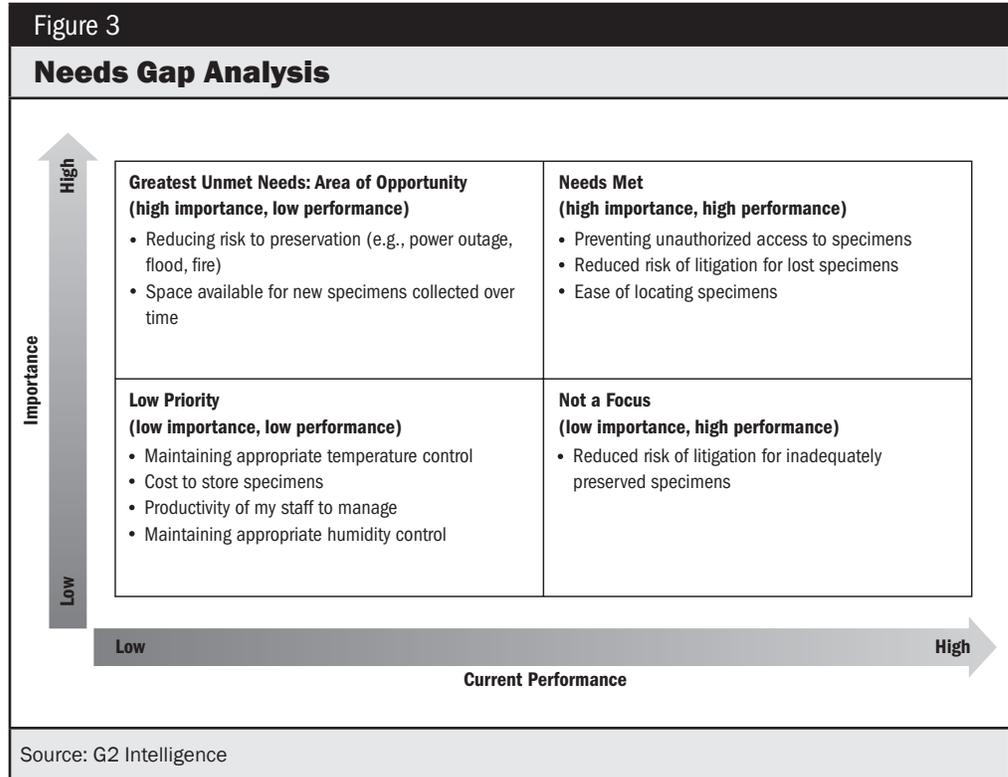
Outsourcing Perceptions

- **Strengths:** Participants indicate they feel the key strengths of outsourced storage are that they no longer have to worry about running out of space, no longer have to fight with administration over space, and can use space for a revenue-generating activity rather than for storage.
- **Weaknesses:** The top perceived weaknesses for outsourced storage are cost and longer turn-around times for specimen pulls. While participants perceive outsourced storage solutions to be more expensive than internal solutions, none were able to cite the actual cost of storing and managing specimens in-house.

Participants who store specimens in-house have little experience with outsourced specimen storage services, and therefore, for many, their perceptions are based on their own expectations, rather than actual experiences. Further education on outsourced options would help to increase knowledge levels which may substantiate or dispel these common perceptions.

Needs Gap Analysis

A needs gap analysis was conducted in order to understand key unmet needs among labs today. Specifically, participants rated each attribute included in Figure 3 in terms of importance to their lab using the scale: not at all, somewhat, very important. Next they were asked to rate the current performance of their lab on the same attributes using the scale: performing poorly, satisfactory, and extremely well. Based on the overall ratings, each attribute was organized from low to high importance and compared qualitatively to determine where the large gaps existed. Only two lab storage attributes that we evaluated are considered to be of high importance, low performance – or within the unmet needs quadrant. Other scenarios of importance and performance fall into the needs met, not a focus, and low priority quadrants.



Unmet Needs: Areas of Opportunity

The first unmet need is straight-forward, *reducing the risk to preservation issues due to a power outage, flood, fire, etc.* Participants have concerns regarding their lab's ability to minimize loss/damage and recover quickly in the event of a disaster (e.g., a flood throughout the entire basement where specimens are stored or an earthquake that damages specimens).

A second unmet need is *having sufficient, secure, and environmentally-appropriate space available for new specimens collected over time.* The low rating can be attributed to the constant worry of running out of space, or knowing that while space is adequate today, it may quickly diminish. A few participants mentioned constant struggles with administration to justify the space used and required for specimen storage.

You'll note attributes labs deemed "unmet needs" to be fairly straightforward. However, the other segments are somewhat contradictory. For example, in the interviews many labs noted challenges with the misfiling of specimens, yet performance in relation to the "ease of locating specimens" was ranked high. Another example would be temperature-control. Many labs rated this attribute low priority and low performing, yet almost all labs use an air-conditioner to maintain an ambient environment.

In the next section we will further explore some of the high and low priority potential needs by comparing the perceived strengths and weaknesses of in-house storage programs to the actual challenges expressed by participants. We will also explore the long term implications if current challenges are left unaddressed.

Real World Experiences:

Given the challenges faced, Hospital A decided to use a hybrid model where they keep the most recent 5 years of anatomical specimens onsite and the remaining specimens are stored at an Iron Mountain facility. This model allows for the most frequently retrieved specimens to be onsite but also maximizes organization space by outsourcing specimens that are rarely needed.

Alternatively, Hospital B decided to outsource storage solutions for two reasons: the radiology department moved to digital films, which reduced the need for the warehouse. At the same time, the warehouse needed about \$1M in upgrades and maintenance. After careful consideration, the hospital decided that outsourcing of specimen storage was the preferred over warehouse renovations.

PERCEPTIONS VS. FINDINGS

Ease of Locating Specimens

Study Findings: Many say the convenience and speed of pulling specimens is the key strength of in-house storage. However, most have experienced some sort of issue related to slide/block storage within their lab, with many reporting that specimens have been misfiled. In the majority of cases those specimens were eventually found, though the process can result in the unnecessary use of FTE bandwidth.

Looking Forward: As a result of the growing pressure “to do more with less”, the bandwidth of laboratory FTE’s will be taxed with additional responsibilities. Labs will need to optimize existing processes and systems to drive greater efficiency and productivity across a multitude of functions in the lab, including storage management.

Outsourcing specimen storage is one such way to reduce time spent on finding and retrieving misfiled slides and blocks.

Temperature & Humidity Control

Study Findings: Temperature and humidity controls are ranked low priority and low performing. However, nearly all participants use an air conditioner to maintain “room temperature” or an appropriate environment, significantly decreasing the risk of sample degradation. This suggests the “low priority” status is likely rooted in the fact that participants feel that temperature controls are a “table stake” or foundational element in any specimen storage program. Likewise, the “low performing” rating may be attributed to the lack of routine temperature and humidity tracking within labs as best practices recommend.

Looking Forward: As labs feel increasing pressure to generate revenue and reduce costs, the current use of space will be re-evaluated. Many labs will move to consolidate facilities, functions, and space across the organization, where possible. Given this, labs will find it increasingly difficult to maintain or acquire onsite space that offers the environmental temperature controls necessary to store specimens within the parameters of the recommended range, which is typically defined as a cool, dry environment below 77-80 degrees F (25-27 degrees C).

Real World Experiences:

Prior to working with Iron Mountain, Hospital B had one FTE who was responsible for pulling and filing all slides, blocks and radiology films. While convenient, at times having only one FTE available posed a problem due to the large volume of research specimens required.

The hospital lab feels that outsourcing with Iron Mountain is running smoothly. They worked with doctors to re-set expectations of slide pull turn-around times and have not had any complaints. The key benefits they have seen as a result of outsourcing include:

- Eliminated worry about safety of the specimens
- Increased ease of requesting specimen pulls and chain of custody by using the Iron Mountain Connect web portal
- Removed the need to spend capital budget to renovate the warehouse

Hospital A has also had a positive experience with the ease of accessing specimens through Iron Mountain. They specifically said, “Previously we had a person doing the running for every specimen requested, now we just need to place an order and it’s delivered.”

Reducing Risk of Litigation for Inadequately Preserved Specimens

Study Findings: Although seen as highly important, labs report they are not performing well at reducing the risk of litigation due to inadequately preserved specimens. In some cases, in-house storage locations became unknowingly high-risk environments as the space for storage was sub-optimal in terms of quality. This has resulted in the damage and permanent loss of many specimens from pest and water damage.

Looking Forward: Labs must properly protect specimens from preservation issues in order to reduce the risk of litigation, especially in an atmosphere when second and third opinions are becoming increasingly prevalent. Large populations of properly preserved specimens can also be leveraged to conduct research that secures grants or be sold externally to support broader research initiatives. Labs should document storage-specific policies and develop procedures that includes regular audits of storage space and workflow processes. This will enable labs to work towards ideal specimen preservation practices.

Productivity of Staff Managing Specimens

Study Findings: In-house storage is largely fragmented across various locations within and outside the organization, resulting in a disjointed specimen inventory system. Additionally, staff within the lab are often responsible for moving large numbers of slides and blocks as space runs out in a storage area. This uses valuable staff time and also puts slides and blocks at risk for damage while being transported.

Looking Forward: It will be important to centralize specimen storage in order to enhance productivity and efficiency of staff as budgets continue to decline. Centralized specimen storage will also lead to greater control over the preservation of the inventory. Organizations will need to look to create a program in which inventory can be stored in ideally one, or a few spaces, that allow for adding increasingly large inventories without constant shifting and relocating.

Cost of Storage

Study Findings: Participants state the costs to store specimens are low importance and for many this is because costs are absorbed at the corporate level. Space and resources required to manage specimens are viewed as “just part of running my lab.” Participants perceived outsourced storage to be more expensive than in-house solutions, but there was no viable comparison as none were able to cite the actual cost of managing specimens in-house, including the real estate and resource line-items on their budget.

Looking Forward: Although labs do not view in-house specimen storage as an expense, the broader organization does. Given an increasingly cost conscious environment due to declining reimbursements, organizations will be looking to identify opportunities for cost savings and increased revenue generation. This includes opportunities to more strategically allocate space.

Real World Experiences:

Hospital A has not faced any issues with outsourced specimen retrieval on a lab level and have not had any complaints from doctors. Key benefits that they have seen as a result of outsourcing are:

- Able to free up onsite space for the storage of the most recent and active specimens
- Able to have more control over the security of specimens by limiting who and how specimens are retrieved. The hospital lab states that, “Before people could help themselves. Now everything is done through a single portal that provides a clear chain of custody.”
- Improved staff productivity
- Consistency of temperature-controlled storage environments

CONSIDERATIONS FOR OUTSOURCING

The findings of this study highlight the need for labs to consider alternative specimen storage strategies as a means of more effectively navigating the current economic climate of reduced reimbursement and tight budgets. Labs openly acknowledge they do not have enough space in-house to accommodate all slide and blocks specimens that they expect to collect in the near future. While some are outsourcing slide and block specimen storage today to address space limitations, others are working to maintain their current fragmented internal space. Within organizations, and especially hospitals, space can be very limited and therefore highly coveted.⁶ In some cases, departments must fight for space from administration, which can cause a tense environment.

The current fragmented in-house approach used in many labs is also short sighted. Available space is finite and specimen storage demands will continue to grow. At some point labs will be faced with one of two options: 1. take on the high cost of building out the proper storage environment or 2. outsource storage. Rather than continually looking for new space and moving specimens from room to room, it would be more productive to build a long-term storage strategy. For example, labs could work towards optimizing available space across the organization, identifying where and how it can be effectively used to advance the top (mission-critical) priorities and objectives. As a general rule of thumb, priority should be given to any activity that is revenue-generating (i.e., for new testing equipment) and then to departments who need the space to perform daily duties. Thereafter, labs should proactively assess future storage needs and conduct a cost/value analysis of acquiring and managing additional storage space compared to the outsourcing of specimen storage. The ease of access associated with in-house storage may not justify the costs and resources required to acquire and manage additional in-house storage space.

Real World Experiences:

Hospital B reports, "At first, we were very demanding. We pull slides for research, clinical trials, and for clinical needs. However, Iron Mountain stepped up to all of our needs. The facility where the specimens are maintained is gorgeous and is far superior to what we had before. Our specimens are super, super safe and easy to get to."

In reality, storing specimens offsite does not result in loss of control of specimens or less than optimal turn-around times. Participants report that, on average, only about 10% of all of their slides and blocks are recalled at some point and most requests come within the first 3 years of slide/block storage. In-line with this, organizations that outsource storage typically keep the most recent slides and blocks on-site in a centralized location and transfer the remaining to an outsourced facility. This hybrid model facilitates timely access of the most active specimens and provides easily scalable storage for ever-growing volumes of less active, archival inventory.

⁶ Is it time for a real office? Growing hospitalist groups are negotiating more office space—and figuring out what they need in it. Available at: http://www.todayshospitalist.com/index.php?b=articles_read&cnt=1632

Additionally, outsourcing to an experienced vendor can help address concerns regarding the lab's ability to minimize loss/damage and recover quickly in the event of a disaster. Rather than being reactive in these situations, there is the option to be proactive, which would help reduce worries about specimen safety. Specialized storage vendors are able to allocate dedicated budget and resources to create optimal environments, enforce up-to-date best practices, and ensure disaster preparedness. In fact, many have disaster recovery plans in place which include safeguards to protect specimens in the event of a natural disaster. This can include annually tested and updated continuity plans and facility safeguards such as alarms, sensors, pathology-specific racking, robust fire protection, and continual monitoring to protect specimens.

Lastly, as demand increases for lab-provided specimens to be used by research institutions, pharmaceutical companies, and biorepositories for research purposes, outsourced storage can provide labs an effective means of consistently administering facility requirements, standardized processes, and ensuring an auditable chain of custody. Compliance to stringent standards is documented by many outsourced storage vendors which helps to ensure the highest quality of the biospecimens. Ultimately, this greatly improves the likelihood that de-identified specimens are eligible for sale after the mandatory storage retention period has elapsed – and, in turn, creates a potential new revenue stream for labs.⁷

CONCLUSIONS

The findings of this study highlight the need for labs to consider outsourcing slide and block specimen storage as a way of more effectively navigating the current economic climate of reduced reimbursement and tight budgets. Outsourcing storage does more than alleviate the stress and worry Lab Managers/Directors/VPs face as a result of the current fragmented space utilization and losing that space for other uses within the organization. It also enables labs to more effectively contain the costs associated with managing growing volumes of specimen storage, more strategically leverage internal resources across the organization, and more aggressively pursue emerging revenue generating opportunities.

⁷ An NCI Perspective on Creating Sustainable Biospecimen Resources. Vaught, J. et al. Journal of the National Cancer Institute Monographs, No. 42, 2011.

APPENDIX

Table 1	
Participant and Lab Characteristics	
Total	n=11
Gender	
Female	4
Male	7
Title	
Vice President	2
Director	6
Manager	2
Administrator	1
Type of Lab*	
Hospital-Based	6
Part of Healthcare System	3
Reference	4
State Lab is Located In	
CA	1
FL	2
MA	1
NH	1
NJ	1
OH	1
PA	2
UT	2
Uses Outsourced Storage in Some Capacity^	
Yes - Iron Mountain	4
Yes - Biorepository	1
Yes - Other medical storage unit	2
No - All in-house	5
*n=2 participants indicated their lab is a hospital & reference lab ^n=1 participant indicated their lab stores slides on-site and outsources block storage Source: G2 Intelligence	

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Sponsored by: G2 Intelligence and Iron Mountain Incorporated

G2 Intelligence provides timely, accurate and trusted analysis of industry and market trends, legal and regulatory developments, and technology and innovation that directly affect the operations, financial performance and competitive position of diagnostic testing laboratories and related medical services providers. The company has covered and reported on the diagnostic industry for over 30 years. G2 Intelligence delivers topical and analytical periodicals, proprietary research studies, and custom advisory services, and through live and virtual events, facilitates industry meetings and information exchanges.

Their mission is to deliver relevant, meaningful and actionable findings on diagnostic industry markets related regulatory changes and lab operations. The organization strives to exceed client expectations and develop mutually beneficial relationships with industry leaders and influencers.

Iron Mountain Incorporated (NYSE: IRM) is a global provider of storage and information management services. Its solutions for records management, data management, document management, and secure shredding help customers to lower storage costs, comply with regulations, recover from disaster, and better leverage their information into a business advantage.

More than 2000 hospitals and 45,000 healthcare accounts trust Iron Mountain for their information protection and storage needs. With a range of health information management and health IT solutions spanning from Records Storage, Document Conversion Services, Release of Information, Secure Shredding Services, Pathology Storage Management, Backup, Archiving and Data Centers, Iron Mountain can help healthcare organizations and laboratories transform the way they manage and protect health information. These solutions can help to lower costs, gain control over records and deliver greater operational efficiencies.

About the Author

Wendy M. Banker, MPA: Wendy is a results-oriented professional with more than 10 years of strategy, marketing and market research experience in the healthcare industry. She is the President of Aurora Research and Consulting, LLC where she acts as the primary consultant on healthcare-focused research projects. Since 2008 she has published articles in *Neurology*, *Epilepsy & Behavior*, *the Journal of Child*

Neurology, The American Journal of Surgery, and The International Journal of MS Care.