



50 Years of Growth, Innovation and Leadership

Nine Trends Changing X-ray and the Future of Radiology

How healthcare trends and radiologist concerns collide, manifesting a crisis point in X-ray

A Frost & Sullivan Executive Brief

Author: Daniel Ruppap, Consulting Director, Healthcare & Life Sciences

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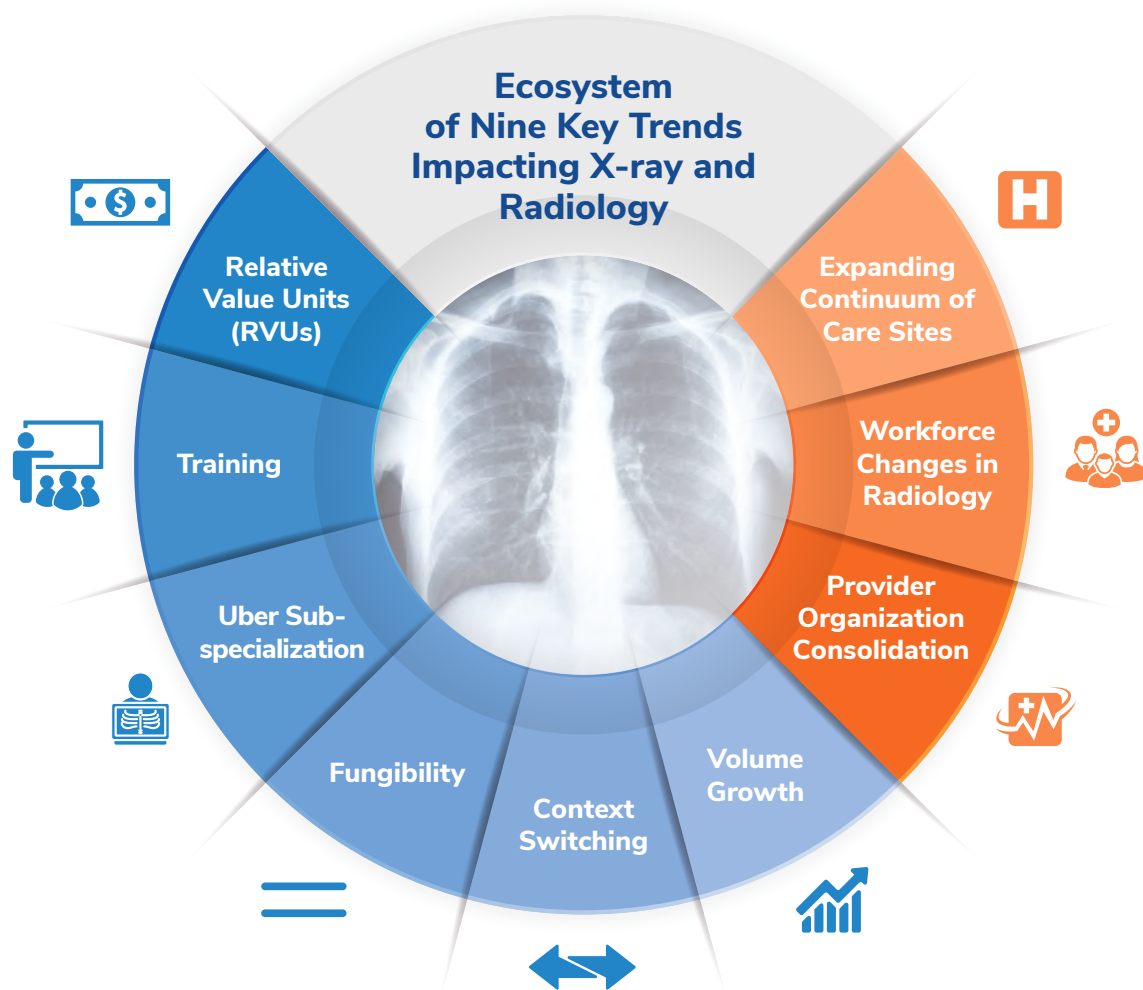
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INTRODUCTION

Better provider work experience and patient outcomes are top priorities in today's healthcare environment, and both are core focal components of the "Quadruple Aim," which includes better provider and patient experiences, improved population health, and lower care costs.¹

Healthcare organizations are also transitioning from a disparate radiology department approach to an integrated Imaging Service Line (ISL), where radiologists are dealing with larger reading lists and providing enhanced service levels, regardless of time of day or location, so their healthcare partners can benefit from economies of scale and skill with the service line approach.² Radiologists face various challenges and are impacted by various macro market trends, creating an ecosystem of dynamics all impacting X-ray and, thereby, radiology (Figure 1).

FIGURE 1



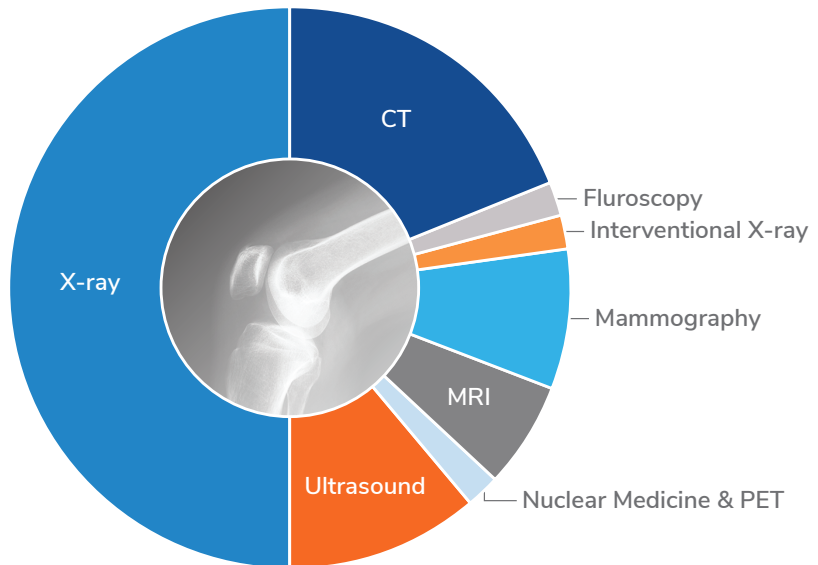
1 Bodenheimer, Thomas and Sinsky, Christine. Ann Fam Med (2014). 12: 573–576.

2 Daher, Nadim. "Fuel Growth in Imaging." Frost & Sullivan.

MACRO HEALTHCARE SECTOR TRENDS IMPACTING X-RAY

Conventional radiography (X-rays) today represents approximately 50% of imaging volume³ (Figure 2) and is a core component of diagnostic imaging. Healthcare providers frequently rely on conventional X-ray studies to aid in the diagnosis, treatment and management of medical conditions in the chest, abdomen and pelvis, extremities, and spine.⁴ X-ray is the start of the diagnostic imaging care pathway in terms of how patient care pathways are designed and enables many fundamental aspects of diagnosis.

FIGURE 2: IMAGING STUDY DISTRIBUTION



“There are [many] critical findings and critical exams that are done with radiography. It’s a mistake to think that even though radiography doesn’t get as much emphasis and focus, that it’s not worthwhile. It’s very worthwhile. Radiography adds a lot of value to the care of patients. Many critical diagnoses are made radiographically in a cost-effective manner.”

— Keith White, MD – Medical Director Imaging Services, Intermountain Healthcare

³ Frost & Sullivan analysis.

⁴ Frost & Sullivan medical imaging syndicated research.



Expanding Continuum of Care Sites

The continuum of care that patients experience continues to change. The growth of urgent care centers, which occurs at approximately 400-500 new urgent care centers per year,⁵ and free-standing emergency department (ED) sites have brought with them greater access to providers in communities. The expansion of these types of brick and mortar sites is contributing to the growth in use of radiography and the need to address those X-rays in a priority manner consistent with customer expectations with urgent care, and to prevent network leakage for IDN-owned urgent care.



Workforce Changes in Radiology

There is a tight job market in radiology, and radiologists are retiring in higher numbers not seen since the 2008 recession (currently, 38% of the radiologist workforce in the US is 55-plus, with 24% 60-plus⁶), resulting in a loss of experience in both the art and science of X-ray. In 2019, a leading open position by hiring organizations on the ACR job board is general radiologist due to the need for organizations to address the volume of X-ray in their service line⁷ in the face an overall tight job market for radiologists.

“The volume, in general, is just pretty overwhelming right now. [It] doesn't seem to be slowing down and the supply of radiologists remains challenging.”

— Chad Calendine, MD, Radiologist, Premier Radiology, a joint venture organization of Saint Thomas Health, Advanced Diagnostic Imaging and MidState Radiology



Provider Organization Consolidation

Given the current trends in M&A and consolidation going on in the market, provider organizations continue to grow in size so they can be the preferred provider in their area of market capture. System and network M&A and consolidation is expected to continue, resulting in a greater expanded presence of large, multi-state networks, shifting the current landscape of approximately 1,600 multi-state hospital organizations to an estimated 400-600 organizations, with growth in the number of statewide or cross-state ultra-large health systems, very large health systems, and mid-to-large-scale integrated delivery networks (IDNs).⁸ For radiology departments and radiology groups, larger and more complicated delivery systems will further alter dynamics and expectations in radiology, from turnaround time (TAT) expectations given integrated urgent care and emergency department requirements, to exam load, volume and mix of different imaging types hitting worklists.

5 Stoimenoff, Laurel and Newman, Nate. "The Essential Role of the Urgent Care Center in Population Health." Urgent Care Association. 2018.

6 Medscape Radiologist Compensation Report. 2019.

7 Data accessed July 2019.

8 American Hospital Association and Frost & Sullivan.

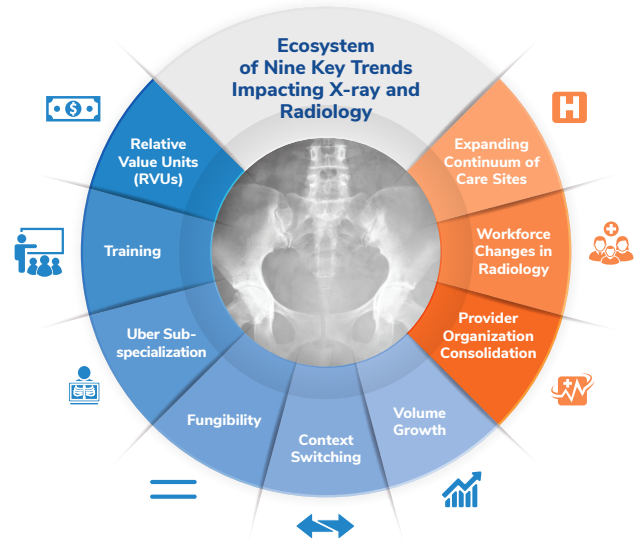


I think that as health systems come more aligned, both vertically and horizontally, there were X-rays that, let's say, were being done in an orthopedics office or an internist/family practice office that in the past they may have just read on their own, whereas now the radiology department is being asked to read them. I think that brings improvements in quality, but it also brings an increase in volume.”

— Radiologist, Integrated Delivery Network

RADIOLOGIST CHALLENGES AND TRENDS WITH X-RAY

As the healthcare market continues to evolve, radiologists will be looking to overcome some of the real-world challenges related to X-ray and new realities of practicing radiology today to be well-prepared to deliver care in the future. Challenges observed by radiologists when it comes to X-ray include:⁹



Volume Growth

Increased access to ERs and the growth of urgent care are driving up the use of X-ray. The volume of X-ray exams can be disproportionate to other types of imaging and can outpace the ability for a radiology group to keep it under control.



Context Switching

Most radiology providers load balance across all radiologists, but the context switching between ultrasound, cross-sectional imaging and X-ray brings fatigue and stress.

⁹ Frost & Sullivan radiologist primary research, 2019.



Fungibility

Radiology providers strive to read within their sub-specialty for the benefit of both the patient and clinician. X-ray tends to be the only modality that is viewed as fungible amongst providers, where all radiologists should be able to interpret X-rays as it is not a specialty “per se” and is often used as “filler” work to normalize workload across shifts.



Uber Sub-specialization

Sub-specialization has radiologists more preferentially focused in their area of expertise and comfort. Ironically, most slots within a radiology group are defined by the “seat” and less about “who” is in the seat (the specialty of the radiologist), so everyone must deal with X-ray during their slot.



Training

Specific X-ray training has declined in focus with the expansion of advanced imaging modalities and technology.



Relative Value Units (RVUs)

X-ray is at the lowest level of RVUs compared to other types of imaging. It accounts for 50% of volume, yet only about 15% of the RVU yield for a radiology group.

“ [A] challenge is that there are relatively few images in an X-ray exam compared to a cross-sectional exam. You spend less time with it, but what that also means is that you’re changing gears from one patient to another more frequently when you’re reading plain films.”

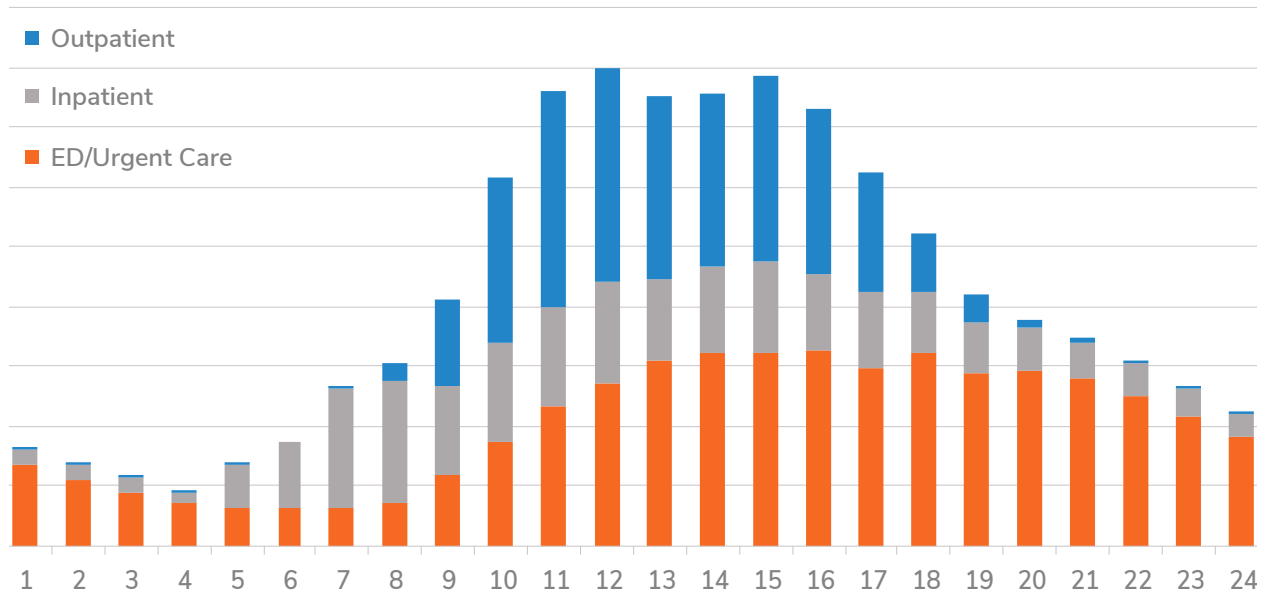
— Juan Carlos Batlle, MD – Radiology Associates of South Florida;
Chief of Thoracic Imaging, Baptist Health

Given the central role of X-ray in diagnostic imaging, it occurs 24x7 in all patient care settings (**Figure 3**). The volume of X-rays hitting a radiology group can cause stress and fatigue for radiologists in terms of the growing worklist and the frequency of context switching. Addressing ways to reduce the “unread” worklist, enable sub-specialization, minimize context switching, and avoiding burnout can bring improved satisfaction to radiologists in their daily job.

There are times where referring physicians are interpreting X-rays, whether in the hospital ED, urgent care center, free-standing EDs, or orthopedic practice simply based on time of day. However, “**It’s not what you see, it’s what you don’t see,**” noted Chad Calendine, M.D., Radiologist, Premier Radiology. While some physicians feel comfortable looking at their area of expertise, they rely on radiology to

confirm assumptions and findings, while also supporting them in areas they may not have the best expertise in, as well as the overall interpretation. The radiologist consultation in any exam is, therefore, a critical component of ensuring that the best care and best outcomes are delivered to the patient.

FIGURE 3: HOURLY DISTRIBUTION OF X-RAYS BY PATIENT TYPE WITHIN AN ISL



Note: Analysis of hospital-based data, ED includes urgent care Inference Solutions—Intelligent Virtual Assistant

X-ray is broad in use throughout the body, which is why it is often referred to as general radiology (**Figure 4**). Higher levels of sub-specialty focus and advanced imaging have deprioritized X-ray at some level out of necessity in terms of training, focus, and service-level agreements. Many radiologists desire to focus more on cross-sectional and advanced modalities. Because the volume of X-ray for a typical organization can be disproportionate to other modalities, a strategy for X-ray is something many radiology groups realize they have to address and do something different than the current status quo given the changing demographics and hiring market within radiology.

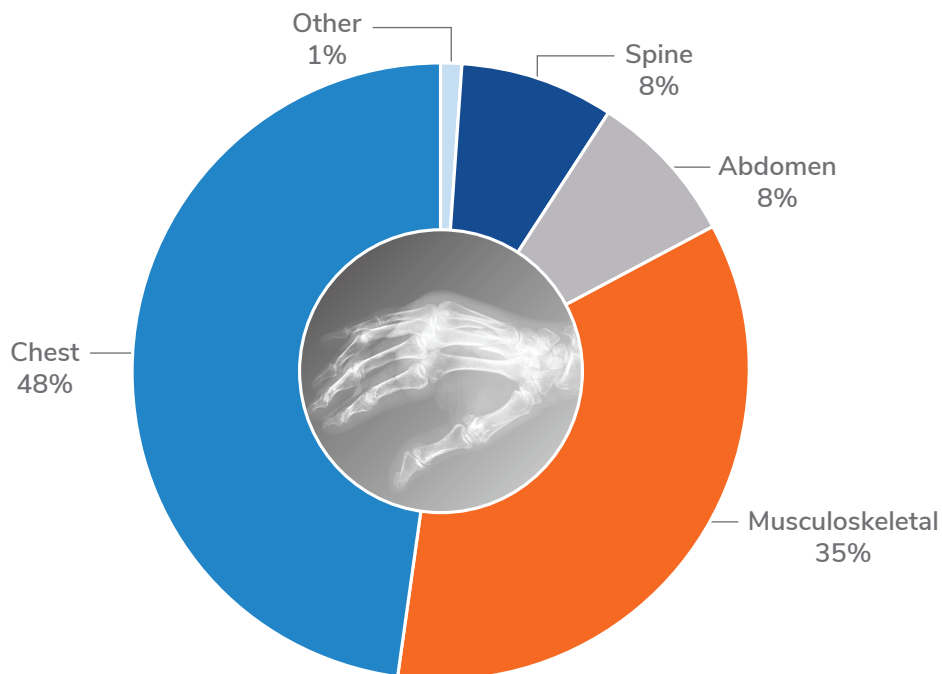
“I would say there is a gradual general trend of the de-emphasis of radiography as a modality that requires a high level of skill set of subspecialty radiologists, and especially if we see the tightening of the market for subspecialty radiology, the number of jobs available is large relative to the number of applicants, then we’re going to see further de-emphasis of radiography.”

— Radiologist, Integrated Delivery Network

“ [Our organization] read[s] largely within our subspecialty and then there’s a fair amount of general work that we all have to do. Our list is organized by due-in timers, so we all see what the oldest cases are and which ones are stat and need to be read more immediately. We don’t staff specifically for X-ray. It’s just a substantial part of our volume.”

— Chad Calendine, MD, Radiologist, Premier Radiology, a joint venture organization of Saint Thomas Health, Advanced Diagnostic Imaging and MidState Radiology

FIGURE 4: DIAGNOSTIC IMAGING (X-RAY) EXAMS BY BODY AREA



“ The more senior radiologists are better at reading the plain films than are the younger radiologists, [who] want to spend their time on cross-sectional stuff and [things] that are sort of more interesting, new or in many ways more rewarding.”

— Radiologist, Integrated Delivery Network

“Groups are being driven into an RVU production model where productivity is all that matters and X-rays are low RVU. If you incentivize people based on RVU, a rational human being is going to start ignoring those. And guess what? That’s what happened.”

— Radiologist, Private Practice Leader

FUTURE PERSPECTIVES

X-ray will remain a cornerstone in diagnostic imaging and is an area for radiologists and radiology groups to assess any challenges they are facing for potential solutions and new strategies. The need to address X-ray in the delivery of care is expected to grow, regardless of growth and priorities in other specialty areas of imaging, resulting in a need for high-quality, high-volume radiologists who are adept at interpretation.

While we expect the work approach of radiologists and other imaging personnel to change in the future given new technology innovations, such as artificial intelligence and natural language processing impacting diagnostic imaging, there is still a road to travel until value propositions and offerings are fully realized in the market.

Given the tight job market in radiology, organizations are striving to attract and keep the best talent in place. An approach to achieve this is to ensure radiologists have both high job satisfaction and high engagement, thereby lowering the possibility of burnout and turnover. Making decisions by involving collaborative feedback from the radiologists can prevent situations where their organization’s desire for economies of scale and skill is at the expense of radiologists and contributes to burnout.

“ I think the value of radiography is, in general, underestimated in today’s world. [It’s] undervalued in the sense that people might think it’s going away or that [its] value [has] declined. I just don’t think that’s true. I think for the cost, it’s a very effective modality that we can’t let drop away.”

— Keith White, MD – Medical Director Imaging Services, Intermountain Healthcare

Both the shortage of available radiologists and the use of X-ray are not going away in healthcare. Radiology groups need to acknowledge the severity of the challenges today and consider strategies that enable their radiologists to work “smarter” and not merely “work harder.” New strategies to enable radiologists to focus on areas of imaging they find more rewarding, such as areas of specialization, to drive productivity and TAT while combating burnout, to address volume, and to have an improved work experience will play an important role in radiology groups being best prepared for today and the future.

SILICON VALLEY | 3211 Scott Blvd, Santa Clara, CA 95054

Tel +1 650.475.4500 | Fax +1 650.475.1571

SAN ANTONIO | 7550 West Interstate 10, Suite 400, San Antonio, Texas 78229-5616

Tel +1 210.348.1000 | Fax +1 210.348.1003

LONDON | Floor 3 - Building 5, Chiswick Business Park, 566 Chiswick High Road, London W4 5YF

Tel +44 (0)20 8996 8500 | Fax +44 (0)20 8994 1389

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