



2022 AUR
Radiology Management Program

Program Syllabus



AUR RADIOLOGY MANAGEMENT PROGRAM

March 23-24, 2022

Location: Estrella

Sheraton Phoenix – Phoenix, AZ

Wednesday, March 23

7:45AM - 8:00AM	Welcome and overview <i>Pablo R. Ros, MD</i>
8:00AM - 9:30AM	Case 1 The Hunger Games: Productivity Bases Compensation Plan for Academic Radiologists <i>Pablo R. Ros, MD, MPH</i> <i>Kristen K. DeStigter, MD</i>
9:30AM - 10:00AM	Break
10:00AM - 11:30AM	Case 2 Healthcare Disparities and Inequities- How Radiology Leaders Can Play A Role In Leading Improvement <i>Alexander Norbash, MD, MS</i>
11:30AM-12:00PM	Alumni Oration <i>Jorge A. Soto, MD</i>
12:00PM – 1:00PM	Lunch
1:00PM - 2:30PM	Case 3 Winning Case: Alternative Radiologist Staffing Model to Address Sub-specialty Radiologist Coverage: Ochsner Health Radiology Case Study <i>Dana Smetherman, MD, MPH, MBA, FACR; Andrew Steven, MD</i>
2:30PM - 3:00PM	Break
3:00PM- 4:30PM	Case 4 Negotiation: Wholistic Approach <i>Christopher P. Hess, MD, PhD</i>
4:30PM - 5:00PM	Discussion



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Thursday, March 24

8:00AM - 9:30AM	Case 5 Academic Radiology Departments Relationships with Industry <i>Matthew A. Barish, MD and Judy Yee, MD</i>
9:30AM -10:00AM	Break
10:00AM - 11:30AM	Case 6 Designing the Academic Mission in an Era of Constraints <i>Reed A. Omary, MD, MS, Lori A. Deitte, MD and Robert Ryu, MD</i>
11:30AM - 12:00PM	Transformational Leadership Through A Coaching Lens <i>Neil M. Rofsky, MD</i>
12:00PM - 1:00PM	Lunch
1:00PM - 2:30PM	Case 7 Academic Radiology Expansion into Regional Practice <i>Jocelyn D. Chertoff, MD, MS, FAUR</i>
2:30PM - 2:45PM	Break
2:45PM – 4:15PM	Case 8 Academic Health Center Staffing: Making DEI Part Of The Equation <i>Marta E. Heilbrun, MD; Jamlik-Omari Johnson, MD</i>
4:15PM - 4:45PM	Closing Remarks
4:45PM – 5:00PM	Program Recognition

Case Study #1

“The Hunger Games: Productivity Bases Compensation Plan for Academic Radiologists”

Pablo R. Ros, MD, MPH

Kristen K. DeStigter, MD

The “Hunger Games”: Productivity Based Compensation Plan for Academic Radiologists

Kristen K. DeStigter, MD and Pablo R. Ros, MD, MPH

Background:

By all traditional measures of success, the Department of Radiology at Midwestern University Medical Center (The Department) was one of the leading academic departments in the country. The faculty was focused in innovation and the Department had discovered novel imaging technologies. Midwestern University Radiology was one of the top Departments in extramural funded research. Educationally, it also did very well on the resident match and ABR performance, and its fellowship programs received rave reviews each year attracting talent nationally. Financially, faculty compensation had remained stable despite shrinking reimbursement for several years due to its increases in productivity. But the Department continued to operate close to a loss for the Academic Medical Center Group Practice and ultimately the Health System.

The Department’s overall priorities were balanced between clinical service, research and teaching; the classic “three-part mission”. Historically, as in most academic departments, there was a greater emphasis on the research and teaching components of the mission. Faculty came and stayed in the Department because of the desire and opportunities to pursue their research and teaching interests. They also enjoyed being able to exclusively practice in their clinical subspecialty. Furthermore, since compensation was tied to academic rank, the majority of radiologists were historically concerned about their academic activities, and less about clinical productivity and service. To pursue their academic interests in the Department, faculty accepted compensation levels that were less than what they could make in private practice.

Nationally and locally, the financial scenario had dramatically changed in just a few years forcing health systems to adapt. Market consolidation in healthcare was rampant and here to stay. Likewise, declines in reimbursement and academic subsidy, combined with increased competition based on clinical service, convenience and price, resulted in declining revenues and a major threat of the established Academic Medicine Center model. Market consolidation implied health systems anchored by an academic medical center were expanding - buying community hospitals and making academic departments to transform into hybrid providers with general and subspecialty practices with variable productivity depending on subspecialty and assignment. Consequently, to survive economically, many departments were being forced by their health systems to accept a productivity based compensation model focused on clinical productivity. It became common for departments to reduce or eliminate faculty academic time, and implement benchmarked productivity goals. In some cases, clinical academic and community tracks were being implemented with different goals, compensation and work schedules. Faculty all over the country had become increasingly demoralized by the change in expectations, lifestyle and reduced emphasis on academics.

Departmental leadership had worked hard to protect Midwestern University Radiology Faculty from these drastic changes. Salaries were maintained and new faculty had been added to accommodate volume growth and the programmatic education and research needs. However,

the economic realities of the current healthcare environment were catching up to the Department and Health System. Although many parts (e.g. research grants) of the multi-dimensional departmental enterprise were still going well, the overall cost compared to income for the clinical service was off balance. It was clear there was no longer tolerance for discrepancy between compensation and clinical productivity benchmarks to pursue academic endeavors and the old order was no longer sustainable.

The Health System COO, Dr. Power, convened all the Chairs of the Clinical Departments to announce a productivity based compensation plan. Dr. Power felt strongly that drastic changes had to be made to prevent unsustainable costs of the Group Practice physicians.

The Strategy:

The Health System strategy was to move on from traditional compensation. Typically, a guaranteed base salary was established at the hiring time, based on market forces plus recruitment needs and pretty much locked in for years with minimal fluctuations except for rank promotions and COLA. Therefore base compensation wasn't directly related to productivity. Although in the past Midwestern University Radiology had implemented a clinical productivity based incentive pay, rewarding both Divisional and Individual performance, this was considered both insufficient and unsustainable for success in the changing financial environment.

Dr. Power's rationale was to fundamentally change a culture of compensation entitlement to compensation accountability. So, base clinical compensation would be determined in an annual basis by the individual radiologist's productivity as compared with a national benchmark stratified by subspecialty and rank. So, it would be fine to increase compensation to busier radiologists and decrease it to others whose practice style would be less efficient.

Initial modeling considered substantial increases in the overall cost of the Group Practice, which would be upset with the commensurate increase in patient revenue.

It was clear that the new comp plan wouldn't address compensation for other parts of the mission, such as teaching, research and administrative duties. These would be considered outside of the plan and therefore untouched. The clinical compensation component was to be determined by the clinical % effort of clinical FTE (cFTE).

Dr. Power's hope was to establish a robust, easy to understand plan, flexible enough to cushion reimbursement changes and compensation variations according to market. But, above all it would introduce a cause/effect relationship between clinical productivity and financial reward.

Further, this strategy was supposed not only to generate more income but also help preserve the academic culture and goals by stopping its traditional subsidization with clinical \$. While the strategy developed by leadership was reasonably sound and according to the external consultants proven in multiple AMCs across the US, there were many challenges to effectively implementing it. Perhaps the biggest challenge for the Department Executive Committee was changing the faculty expectations without demoralizing them or losing sight of the academic components of its mission. Many faculty members perceived that meeting expectations would erode the traditional radiology team rather than individual culture. Faculty also perceived a significant conflict between their clinical goals, the academic requirements for promotion and fulfillment of their own academic and teaching interests and satisfaction.

The Plan:

One key element was to adopt a single plan for the entire group practice to minimize variations among its over one thousand academic physicians distributed in over 20 departments. Dr. Power and the Group Practice's HR service liked this simple and fair approach, plus facilitated implementation.

A second factor was to adopt established compensation and productivity national benchmarks, such as the AAARAD in Radiology. The productivity unit would be the wRVU, individually based.

The third component of the plan would be to reset the base compensation annually.

An incentive component (approximately 5% of the base comp) would be added, based primarily on goals other than productivity such as quality, citizenship, program development, etc. The incentive goals were to be developed by each Department with Group Practice supervision.

It was emphasized from the beginning that the program was not at all likely to be "the perfect" program, but rather a reasonable "start" and to refine it in the years to come. The chosen mechanism to introduce changes was to establish a Compensation Council chaired by Dr. Power and integrated by Department Chairs and other key physicians.

Incentive Plan Design and Implementation:

The Incentive Plan was designed to exclusively encourage and reward individual clinical productivity without changing compensation for academic and administrative contributions.

The details of the Compensation Plan were announced to the Department Chair, Dr. Ray, a few months prior to its implementation. Among the Chairs and faculty of the Group Plan there was heavy resistance. There were concerns about the potential adverse impact the plan would have on morale and collegiality.

BASE SALARY

- Clinical comp only. No changes in research, teaching or admin components of comp
- Clinical productivity, compared to national benchmark
- All faculty with a cFTE \geq 0.20 included
- Set annually, based on past year performance
- Minimal clinical productivity: 50thtile
- Academic Rank comp benchmark

INCENTIVE COMPENSATION

- Departmental leadership design, menu style:
 - Quality (peer reviews, report TAT, etc.)
 - Citizenship (Grand Rounds and faculty meetings attendance, program development, etc.)
 - No research and education components (excluded from Clinical Productivity Incentive Comp)

Dr. Ray was concerned because in his heart believed radiology in general, but particularly Midwestern University Radiology, functioned well and was productive as a team rather than individuals (overall productivity had been about 75% of benchmark). Because Dr. Ray and his Executive Committee had asked the Division Chiefs to pay attention, there weren't large productivity discrepancies between faculty members within the different divisions.

Dr. Ray calculated the effects of the new plan after the 6 months trial period offered by Dr. Power. During this time no compensation changes were to happen but data would be collected for future implementation. With some trepidation the early modeling wasn't as bad as anticipated and many radiologists were set up to receive salary increases.

Review of performance measures during the trial period:

The overall clinical productivity increased about 7% over the previous year. Likewise, volume in the Department increased by 5%. Some individual Divisions had more significant increases than others did. Some Divisions showed no change in clinical productivity; and some even showed a decrease. The latter was especially noticed in sections with discordance between volume increase and added staff. Also, there was no longer resistance among faculty to cover unsavory shifts to support the System's growing strategies in ever more distant locations and evening/weekend hours.

This was the good news. However, something was very different at Midwestern University Radiology. The climate among radiologists had changed. Anecdotal comments about the plan from the faculty were mixed. There was a perception among many that morale was decreasing. The compensation plan that focused on clinical productivity was brought up as a symbol of the decreased emphasis on academic interests and satisfaction. There were strong feelings that faculty were working as hard as they could and that they felt greater conflict between their compensation versus their academic promotion. For many it was tough to resolve this conflict on a day-to-day basis. Some people felt that the Department and the System should focus their energy on providing greater support for the individual's academic goals rather than clinical productivity based compensation.

The intradivisional competitiveness was clearly increasing and undesired behaviors started to appear. Poaching of simpler cases became routine, faculty were telling residents to assign cases to them and not to the attending of record, etc. Tensions started among colleagues who had collaborated for years. Interdivisional issues were also happening particularly between the community hospitals and academic medical center radiologists. Everyone was watching his or her RVU's!

One day, Dr. Ray heard from another Clinical Department Chair that radiologists were calling the current compensation plan "the Hunger Games".

After hearing these comments and even suffering poaching and snappy remarks himself, Dr. Ray decided to convene the Department's Executive Committee (EC) to strategize a response to the new compensation plan.

In his introductory remarks to Radiology's EC, Dr. Ray stated that it was clear that the plan had increased clinical productivity and service. Furthermore, he stated that the plan only rewards "productive" people and, therefore, will only appear positive to those who meet these criteria.

Plus, no matter what comp plan is implemented, there would be complaints about it and is critical to have a flexible comp model. It was his feeling however that legitimate adjustments had to be proposed to improve it and make viable. Some more radical views included scrapping the plan altogether. End the Hunger Games!

Your charge:

You are a member of Midwestern University Department of Radiology Executive Committee. A special meeting of the EC has been scheduled on Thursday to modify the Health System's Compensation Plan. In preparation for the meeting, please develop your recommended answers to the following questions.

- 1) Would you recommend keeping Radiology out of the new plan entirely?
- 2) What arguments would you use to explain to the Comp Council that Radiology is different than other specialties?
- 3) Would you change or maintain the proposed Productivity Comp Plan?
 - Why?
 - How?
- 4) How would you "sell" your recommendations to your Radiology colleagues?
- 5) What would you do to increase the likelihood that the plan would be successful?
- 6) What other tools would you use to motivate clinical faculty to improve performance?
- 7) What do you believe are realistic consequences if the compensation plan is implemented as designed?
- 8) How long will it take for fundamental change to occur?
- 9) What would be the key components of your change management strategy?

Case Study #2

“Healthcare Disparities and Inequities- How Radiology Leaders Can Play A Role In Leading Improvement”

Alexander Norbash, MD, MS

Case 2: Healthcare Disparities and Inequities – How Radiology Leaders Can Play A Role In Leading Improvement

Alexander Norbash, MD, MS

Proud and scared; with thanks to Peter Abraham, Christiane El Khoury, Anthony Tadros, and Dorathy Tamayo-Murillo

Situation

Mrs. Smith to Mammography Technologist: I would like to thank you for doing my mammogram. You were very thoughtful and professional, and I appreciate it.

Mammography Technologist to Mrs. Smith: Thank you very much. Dr. Frank will be right in. If you don't mind following me to the consultation room at the end of this hall, she would like to go over your mammogram findings with you.

Mrs. Smith: Is that routine?

Mammography technologist: Yes, it is.

(Mrs. Smith and the Mammography Technologist leave the mammography room, walk to and enter the consultation room)

Mammography Technologist: Mrs. Smith, please have a seat and make yourself comfortable.

Mrs. Smith: As you know, I'm somewhat concerned since I felt the lump in my left breast, and I just want reassurances that everything will be alright.

(Knock on the door, which then opens and Dr. Frank enters)

Dr. Frank: Good afternoon, Mrs. Smith, I'm Dr. Frank, and I'm pleased to meet you. Please let me know if our medical student, Mr. George Andrews, can join us.

Mrs. Smith: Good afternoon, Dr. Frank. I'm pleased to meet you too. You have a great team here. Certainly, Mr. Andrews can join as far as I'm concerned.

(Dr. Frank and Mr. Andrews enter and close the door, as the Mammography Technologist exits)

Dr. Frank: Thank you, Mrs. Smith. I am grateful to work with such great partners. Mrs. Smith, as you know, you have a lump in your left breast, which coincides with a very concerning appearance on mammography.

Mrs. Smith: What do you mean very concerning?

Dr. Frank: Based on its appearance on mammography, I believe it is most likely cancerous and will need to be treated. We typically perform a biopsy to confirm the diagnosis in such instances, and I would like your permission to do so at the earliest available opportunity.

Mrs. Smith: Have you shown my mammogram to anyone else?

Dr. Frank: No, ma'am. Please let me know why you ask.

Mrs. Smith: I just want to be sure that your diagnosis is correct before committing myself to treatment. My personal experience with friends and family does not support the contention that physicians and the healthcare system are infallible. Dr. Frank, what would a course of treatment for such a tumor consist of?

Dr. Frank: Mrs. Smith, breast imaging is my subspecialty, and I have been practicing it exclusively for the past 10 years. Our center is regarded highly, and I promise you we do our best to deliver a high level of care to our patients. If your tumor turns out to be concerning, treatment may include a combination of surgery, radiation treatment, and chemotherapy.

Mrs. Smith: Thank you for your explanation. I am not a fan of radiation treatment or chemotherapy. How long would I be out if I choose the surgical option, and who is the head of your breast imaging unit?

Dr. Frank: The amount of recovery time following a surgical procedure to a great degree depends on the work activities you expect to perform. And our breast imaging unit director is Dr. Jones, who is currently out of town on personal business. Why do you ask?

Mrs. Smith: I have to return to work as soon as possible and cannot afford to be laid out for a prolonged period. I was just wondering--is Dr. Jones also a lady doctor?

Dr. Frank: Yes, she is. And she is an exceptional breast imager. I would be happy to show her your images on her return to make you more comfortable. In the meantime, I would strongly suggest we get a time on the books for your biopsy, in addition to helping coordinate a visit for you with our breast surgery division. Please let me know if we have your permission to do so.

Mrs. Smith: Please tell me if you have any gentlemen doctors who happen to do breast imaging.

Dr. Frank: Yes, we have two gentlemen doctors who perform breast imaging.

Mrs. Smith: If you don't mind, I would greatly appreciate it if you could confirm their agreement with your diagnosis.

Dr. Frank: Certainly, Mrs. Smith. If you don't mind waiting here, I will see if one of them is available to review your images, and I will be right back. If you don't mind, please wait here, this should only take ten to fifteen minutes.

(Dr. Frank and Mr. Andrews exit the consultation room and close the door)

Background

While bathing, Mrs. Betty Smith recently discovered a marble-sized lump in her left breast. Mrs. Smith is in her late 60s and lives on the South Side of Chicago within the same 20 square blocks for her entire life. Her neighborhood has always been dangerous throughout the past 60 years. Fits and starts of gentrification occasionally promised a brighter and safer future that never really transpired. Mrs. Smith as a proud and independent woman, currently commutes to her job daily and works as an administrative assistant downtown.

Unfortunately, Mrs. Smith lost her husband and the love of her life to COVID about a year ago. Similar to his wife, he was also strong and independent and always found handyman jobs to keep them afloat. Mr. Smith had difficulty controlling his diabetes and severe hypertension. Even with a mild disease in the beginning, Mr. Smith's COVID infection accelerated quickly, leading to his prolonged hospitalization. Despite being heartbroken, Mrs. Smith always hides it behind her proud and strong demeanor. Even though Mrs. Smith endured the painful loss of her husband, she still has severe misgivings about the

COVID vaccine. Mrs. Smith has no children and is petrified at the prospects of staying home. In reality, she is concerned that any absences or lack of dedication will inevitably lead to her dismissal.

Dr. Jeannette Frank is a dedicated and brilliant breast imager and her parents are both respected and celebrated professors at the University of Chicago. Dr. Frank graduated from Princeton as a physics major, attended Stanford University School of Medicine, and then completed her residency in radiology and fellowship in breast imaging at Johns Hopkins University. She subsequently joined the breast imaging division at the University of Chicago ten years ago. Dr. Frank has a remarkable philanthropic side. In fact, she spends an extraordinary amount of her time volunteering in the free clinic and leads her local National Medical Association chapter as president.

Mr. George Andrews is a fourth-year medical student at the University of Chicago. Mr. Andrews grew up in MacDonal, West Virginia, and by any reasonable measure would have been expected to be a seventh-generation coal miner if it were not for his record-setting performance on routine, standardized tests in elementary school. Much of Mr. Anderson's extended family lives in unthinkable poverty. To any outside observer, Mr. Anderson might as well be another tall and well-dressed young professional-in-the-making. Mr. Anderson certainly feels very different; he is wholly displaced from his family and loved ones and feels like an impostor. Most importantly, Mr. Anderson cannot bring himself to believe the staggering chasm separating the healthcare he's part of and the one received by his loved ones back home.

Assessment *and* Recommendations

What should Dr. Frank do to make Mrs. Smith trust her more? Should she try to find out why Mrs. Smith is doubting her diagnosis? Is it possible that Mrs. Smith feels like she is not being listened to?

- Should Dr. Frank ask more questions about Mrs. Smith's life situation and try to be more understanding? Is Dr. Frank focusing on making Mrs. Smith trust her more than her trying to truly understand her life situation? In case needed, at what point should Dr. Frank suggest a visit with social workers?
- Should Dr. Frank take more time to educate Mrs. Smith about the different treatment courses and explain the risks versus the benefits? Would patient education help the patient feel more reassured in this situation?
- Did Dr. Frank acknowledge the potential fears and concerns of Mrs. Smith appropriately? What else could she have done to make that more perceptive?
- Before accommodating the patient's request for a different doctor, should Dr. Frank wonder whether this patient's preference is strongly held, or might a few more minutes of building rapport change the patient's mind?
- At what point should Mr. George Andrews interfere and reassure the patient? Will he be able to enhance the situation? And how?

- What do you think of the term “lady doctor”? Do you think that language that embraces cultural attitude is hard and slow to change?
- Why in these days, where there are more female medical students than male ones in many institutions, should a female doctor be labeled as such?

Alumni Oration

Jorge A. Soto, MD

Case Study #3

“Alternative Radiologist Staffing Model to Address Sub-specialty Radiologist Coverage: Ochsner Health Radiology Case Study”

Dana Smetherman, MD, MPH, MBA, FACR
Andrew Steven, MD

Alternative Radiologist Staffing Models: Finding a Balance Between General & Sub-specialty Radiologist Coverage Needs

Dana Smetherman, MD, MPH, MBA, FACR
&
Andrew Steven, MD



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Gulf South Health System (GSHS)

- Multispecialty group practice
- Rapid expansion
 - 2005: Gulf South Medical Center (GSMC) tertiary care hospital + a few small satellites in Crescent City
 - 2021: 40 owned/managed/affiliated hospitals + 100 outpatient health centers & urgent care facilities
- GSHS Radiology Department (GSHSRD)
 - Often asked to provide coverage at newly acquired sites
 - 2005: 14 full-time & 1 part-time sub-specialized radiologists at GSMC
 - 2021: 52 full-time & part-time general & sub-specialized radiologists (29 DR, 16 ER, 7 IR)



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Gulf South Health System Radiology Department

- In addition to cover at new community hospitals, GSMC has increased in size & complexity of inpatient & outpatient examinations
 - 2005: 400 beds at GSMC flagship hospital
 - 2021: 750 beds at GSMC flagship hospital + Centers of Excellence in Cancer Services, Cardiology, Neurosciences, Orthopedics, Pediatrics, Women's Services, & Abdominal Transplant



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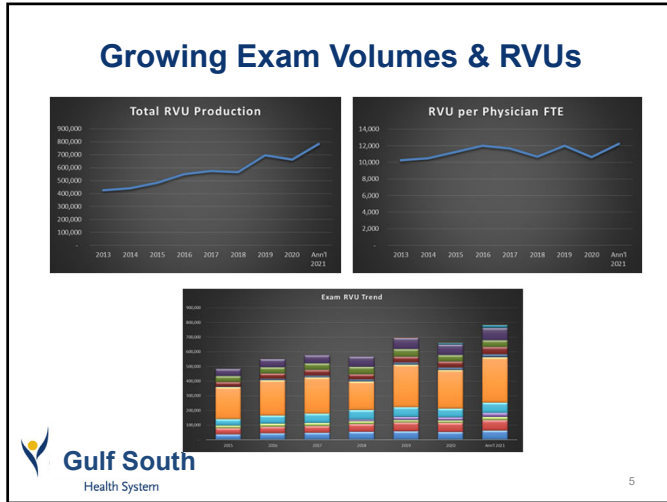
Gulf South Health System Radiology Department

- 2021 Diagnostic Radiology Weekend Coverage
 - GSMC + 4 community hospitals + freestanding ED + 3 diagnostic radiologists from any sub-specialty; 6 weekends/year
 - Emergency radiologists (ERads) - 24/7/365, overlapping 9 hour shifts
 - ERads unable to cover all stat examinations during daytime hours
 - Group meetings identified largest pain points being Neuroradiology and MSK inpatient, ED, and outpatients examinations at GSMC, especially on weekends
 - Struggling to assemble weekend diagnostic radiologist teams with necessary skill sets

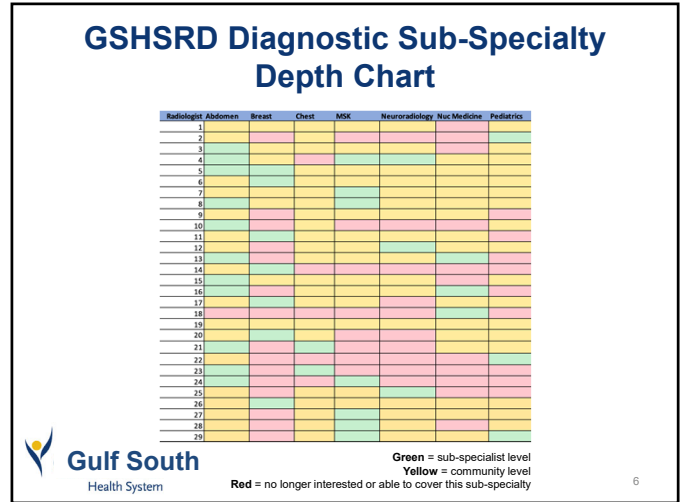


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5



6

- ### Factors to Consider in Developing GSHSRD Staffing Challenges
- Need for additional resources (including financial)
 - Disruption to the current staffing model
 - Time needed for implementation (including recruitment and onboarding)
 - Difficulty of implementation
 - Extent to which the proposed change would solve each problem
 - High volume on weekends
 - Availability of neuroradiology and MSK radiology sub-specialty expertise on weekends
 - Availability of sub-specialty expertise overall on weekdays and weekends
 - Alignment with GSHS future growth
 - Degree to which the sub-specialty imaging needs of patients and referring providers are addressed
- Gulf South**
Health System

7

- ### Gulf South Health System Radiology Department
- What solutions would you propose to improve GSHSRD's radiologist coverage?
 - What internal and external barriers do you anticipate GSHSRD will face in executing potential solutions? How might the COVID-19 pandemic have affected these barriers?
 - A famous quote (often attributed to management thought leader Peter Drucker) notes, "Culture eats strategy for breakfast." What role might departmental and/or organizational culture play in the ultimate success of new staffing models? What might you do to preserve the GSHSRD culture?
 - If your initial proposed solution is either not accepted by the group or cannot successfully be implemented, what other options might you consider?
- Gulf South**
Health System

8

Case 3: Alternative Radiologist Staffing Models: Finding a Balance Between General & Sub-specialty Radiologist Coverage Needs

**Dana Smetherman, MD, MPH, MBA, FACR and Andrew Steven, MD
Ochsner Health Department of Radiology**

Executive Summary

The use of alternative staffing models can be an innovative, powerful, and cost-effective tool to meet the evolving needs and expectations of patients and providers within a dynamic and growing health care system. Employing innovative radiologist staffing models has allowed our diagnostic radiology group to dramatically improve its weekend coverage and sub-specialty bench strength.

Background

Gulf South Health System (GSHS) is a multispecialty group practice founded in 1942. GSHS has endured many challenges, including World War 2, pandemics, hurricanes, oil spills in the Gulf of Mexico, and economic difficulties. In 2005, the GSHS Radiology Department (GSHSRD) was comprised of 15 sub-specialized radiologists who covered the Gulf South Medical Center (GSMC), a tertiary care hospital of approximately 400 beds, and a small number of outpatient clinics in Crescent City, a mid-sized metropolitan area with a population of approximately 1 million. In 2006, GSHS acquired three community hospitals in the geographic area surrounding Crescent City. By 2021, through continued growth by mergers, acquisitions, and partnerships, GSHS had evolved into the region's largest non-profit academic healthcare system with 40 owned, managed, and affiliated hospitals, more than 100 outpatient health centers and urgent care facilities, 32,000 employees, and over 4,500 employed and affiliated physicians.

When additional community hospitals joined GSHS, the Radiology Department was frequently asked to provide imaging services at these new sites. By 2021, the GSHSRD had grown from a group of 15 sub-specialized radiologists covering only GSMC to 52 full and part time employed radiologists and 7 prn radiologists. To cover radiology services at the newly acquired community hospitals, GSHSRD had to shift to hiring radiologists with a general skill set, a departure from the previous staffing model. To further address the needs of the GSHS community hospitals, the GSHSRD also expanded its nuclear medicine and breast imaging sections and relieved the interventional radiologists from diagnostic radiology responsibilities.

Initially, after hours emergency radiology services at the community hospitals were provided by an outsourced teleradiology company. In 2011, GSHSRD started an internal emergency radiology (ERad) section. By 2021, this ERad section had grown from 2 to 16 radiologists who covered stat exams 24/7/365 at GSMC and the 4 GSHS community hospitals in the Crescent City area. The ERad physicians worked either one week on/one week off or one week on/two weeks off schedules and provided coverage in overlapping 9-hour shifts. This experience with the ERad section had also allowed GSHSRD to gain experience with remote interpretation and supervision of trainees and technologists, reducing or eliminating geographic constraints for some hires. As in many other departments, this trend toward remote and hybrid radiologist work was accelerated during the COVID-19 pandemic.

Although most of the GSHSRD diagnostic radiologists had fellowship training and areas of sub-specialty interest, almost all diagnostic radiologists were expected to maintain general radiology skills to help cover services on weekdays and weekends at the community hospitals. Weekend coverage consisted of a general call pool with three daytime diagnostic radiologists from any sub-specialty working from 8am to 5pm on Saturday and Sunday. The radiologists' weekend responsibilities included inpatient, outpatient, and emergency department examinations at GSMC and 4 community hospitals; a freestanding Emergency Department; multiple urgent care centers; and outpatient imaging at clinics in the Crescent City area. In 2021, members of the GSHSRD diagnostic call pool worked approximately six weekends per year.

As GSHS was expanding by adding community hospitals, the GSHS flagship hospital at GSMC was also growing. By the end of 2020, GSMC had become the major tertiary/quaternary referral center for the region with centers of excellence in Cancer Services, Cardiology, Neurosciences, Orthopedics, Pediatrics, Women's Services, and Abdominal Transplant. The GSMC flagship hospital had likewise increased to 750 beds. As a result, radiology exam volume and complexity had progressively trended upward in the inpatient and outpatient settings at GSMC, including after hours and on weekends. (Attachment 1) Even with 24-hour support from the ERad section, exam volumes were reaching a breaking point and the ERad section could not cover all stat exams during the daytime hours. The complexity of sub-specialty coverage at GSMC left some general and emergency radiologists practicing outside of their comfort level. These challenges were particularly problematic on weekends, when it had become difficult to put together radiologist teams with an optimal mix of sub-specialty skills.

At the same time, there was also resistance to increasing the frequency of weekend call and hiring additional radiologists from some GSHSRD members. Fears stemmed from the idea that moving to fully sub-specialized weekend coverage would require too many new hires, leading to excess staffing on weekdays with a group of highly sub-specialized radiologists whose skills were not flexible enough to

help at community sites. Although the radiologists were salaried and did not have individual RVU targets, there was also concern that compensation would be adversely affected if exam volume per radiologist decreased.

Case Evaluation

In summary, the problem facing the GSHSRD was how to balance the general radiology needs at multiple community hospitals while simultaneously providing the necessary sub-specialty expertise to cover a highly specialized tertiary/quaternary referral center on weekdays and weekends in a practice that had continued growing despite the pandemic. Recognizing the volume of complex examinations and overall number of studies would likely continue to grow, a survey was distributed to assess the sub-specialty expertise and preferences of the current group of GSHSRD diagnostic radiologists. (Attachment 2)

While it was apparent that changes to the existing staffing model were necessary, GSHSRD leadership wanted to be sensitive to the career goals and aspirations of existing department members. The GSHSRD diagnostic radiologists were asked to indicate whether they wanted to interpret examinations from each sub-specialty at a sub-specialist level, at a generalist level, or not at all. A spreadsheet was generated to determine both individual preferences and sub-specialty gaps. (Attachment 3) In some cases, more detailed information was needed. For example, although 7 radiologists expressed an interest in performing musculoskeletal (MSK) radiology at a sub-specialty level, only 3 wanted to provide coverage for examinations on professional athletes (a significant subset of the MSK radiology work on weekends and part of GSHS's partnerships with local sports franchises).

At the same time, meetings were conducted to determine the greatest pain points for the diagnostic radiologists. Overall, managing the volume and complexity of inpatient and outpatient studies at GSMC on weekends was widely acknowledged as the highest priority. These meetings also identified neuroradiology and MSK radiology as the greatest sub-specialty gaps and areas of stress for the diagnostic radiologists on weekends. The feedback from these group sessions paralleled the results of the sub-specialty interest survey. Although GSHSRD leadership recognized the need to continue to aggressively recruit in multiple other sub-specialties (chest and pediatric radiology, for example), they decided to first focus on the most pressing needs on weekends - neuroradiology and MSK radiology – which seemed to have the highest degree of urgency to the radiologists and GSHSRD leadership.

To evaluate potential solutions, multiple parameters were developed to guide decision making, including:

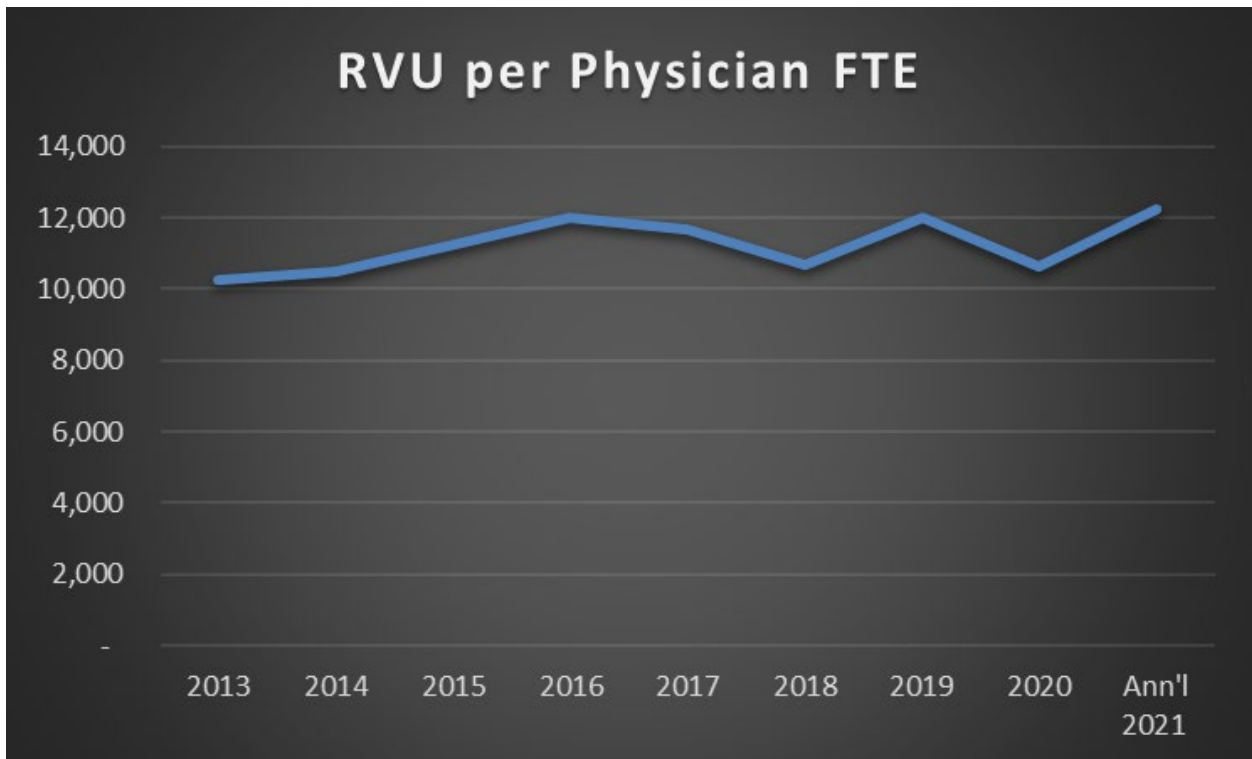
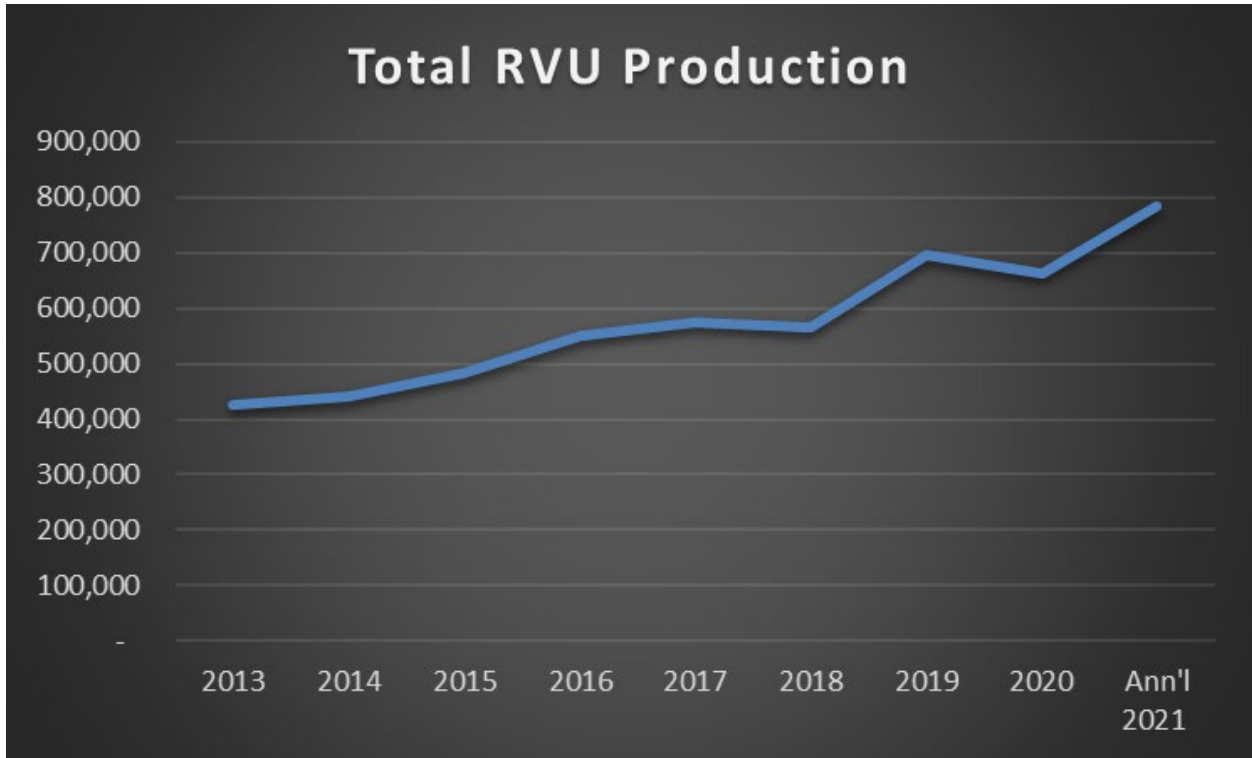
1. Need for additional resources (including financial)
2. Disruption to the current staffing model
3. Time needed for implementation (including recruitment and onboarding)
4. Difficulty of implementation

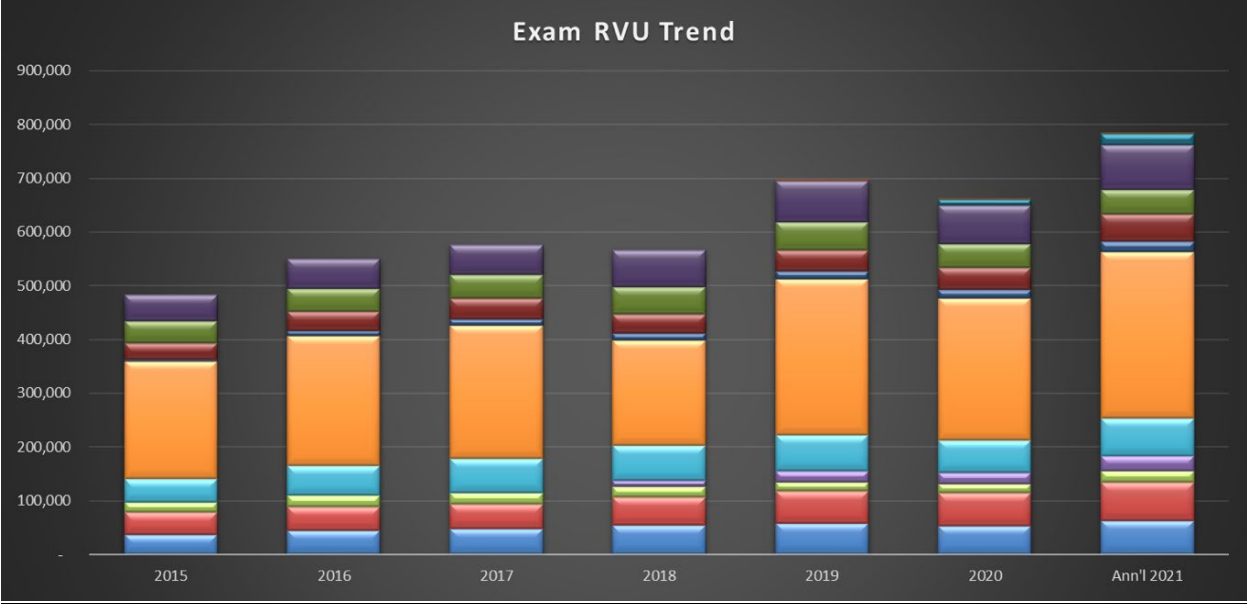
5. Extent to which the proposed change would solve the problem
 1. High volume on weekends
 2. Availability of neuroradiology and MSK radiology sub-specialty expertise on weekends
 3. Availability of sub-specialty expertise overall on weekdays and weekends
 4. Alignment with GSHS future growth
 5. Degree to which the sub-specialty imaging needs of patients and referring providers are addressed

Questions:

1. What solutions would you propose to improve GSHSRD's radiologist coverage?
2. What internal and external barriers do you anticipate GSHSRD will face in executing potential solutions? How might the COVID-19 pandemic have affected these barriers?
3. A famous quote (often attributed to management thought leader Peter Drucker) notes, "Culture eats strategy for breakfast." What role might departmental and/or organizational culture play in the ultimate success of new staffing models? What might you do to preserve the GSHSRD culture?
4. If your initial proposed solution is either not accepted by the group or cannot successfully be implemented, what other options might you consider?

Attachment 1





Colors represent the volumes from various GSHS facilities. The largest volumes (orange) are from GSMC.

Attachment 2: **Diagnostic Radiologist Sub-Specialty Preference Survey**

Future Planning - Diagnostic Radiology

For each of the following sub-specialties of diagnostic radiology, please indicate your preference about performing the sub-specialty in the future and to what extent/level of expertise.

1. Please give your name'

2. Abdominal Imaging

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this sub-specialty

Other (please specify)

3. Breast Imaging

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this subspecialty
- Other (please specify)

4. Chest Radiology

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this sub-specialty
- Other (please specify)

5. Musculoskeletal Radiology

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this sub-specialty
- Other (please specify)

6. Neuroradiology

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this sub-specialty
- Other (please specify)

7. Nuclear Medicine

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this sub-specialty
- Other (please specify)

8. Pediatric Radiology

- At a sub-specialty level
- At a generalist level
- I prefer not to practice this sub-specialty
- Other (please specify)

9. Is there anything additional we need to know about your preferences regarding your future practice?

10. Would you be interested in changing to a 7 on/7 work rotation covering a single sub-specialty or Emergency Radiology if it were available? If so, what subspecialty?

Attachment 3:
Radiology Sub-Specialty Depth Chart

Radiologist	Abdomen	Breast	Chest	MSK	Neuroradiology	Nuc Medicine	Pediatrics
1	Yellow	Yellow	Yellow	Yellow	Yellow	Red	Yellow
2	Yellow	Red	Yellow	Red	Red	Red	Green
3	Green	Yellow	Yellow	Yellow	Yellow	Red	Yellow
4	Green	Yellow	Red	Green	Green	Yellow	Yellow
5	Green	Green	Yellow	Yellow	Yellow	Yellow	Yellow
6	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow
7	Yellow	Yellow	Yellow	Green	Yellow	Yellow	Yellow
8	Green	Yellow	Yellow	Green	Yellow	Yellow	Yellow
9	Yellow	Red	Yellow	Yellow	Yellow	Yellow	Red
10	Green	Red	Yellow	Red	Red	Red	Yellow
11	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Red
12	Yellow	Red	Yellow	Yellow	Green	Yellow	Yellow
13	Green	Red	Yellow	Yellow	Yellow	Green	Red
14	Yellow	Green	Red	Red	Red	Red	Red
15	Green	Yellow	Yellow	Yellow	Yellow	Red	Yellow
16	Green	Red	Yellow	Yellow	Yellow	Green	Red
17	Yellow	Green	Yellow	Yellow	Red	Yellow	Yellow
18	Red	Red	Red	Red	Red	Green	Red
19	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
20	Yellow	Green	Yellow	Red	Red	Yellow	Yellow
21	Green	Red	Green	Red	Red	Yellow	Yellow
22	Yellow	Red	Red	Red	Red	Red	Green
23	Green	Red	Green	Red	Red	Red	Red
24	Green	Red	Red	Green	Red	Red	Red
25	Yellow	Red	Yellow	Yellow	Green	Red	Red
26	Yellow	Green	Yellow	Yellow	Yellow	Yellow	Yellow
27	Yellow	Red	Yellow	Green	Yellow	Yellow	Yellow
28	Yellow	Red	Yellow	Green	Yellow	Red	Yellow
29	Yellow	Red	Yellow	Green	Yellow	Yellow	Green

Green = sub-specialist level

Yellow = community level

Red = no longer interested or able to cover this sub-specialty

Definitions:

Sub-specialty level – able to cover all studies performed at OMC-NO in this sub-specialty on weekdays and weekends without assistance; recognized as a subject matter expert in this sub-specialty and able to provide support for community radiologists; involved in the teaching of trainees (medical students, residents, fellows) in this sub-specialty.

Community level – able to cover this sub-specialty at the community hospitals with appropriate back-up by sub-specialists; can perform some but not all studies in this sub-specialty (examples: can cover body ultrasound and CT but not body MRI; can cover screening and diagnostic mammography but not breast MRI or breast procedures); generally, not involved in the teaching of trainees (medical students, residents, fellows) in this sub-specialty.

Case Study #4

“Negotiation: Wholistic Approach”

Christopher P. Hess, MD, PhD



2022 Radiology Management Program

CASE 4 & DISCUSSION

Principles of Negotiation for Radiology Leaders

Christopher P. Hess, MD, PhD

MOUNTAIN UNIVERSITY HEALTH AND RADIOLOGY SOLUTIONS PARTNERS – STRONGER TOGETHER?

Mountain University Health (“MUH”) is an academic healthcare system that serves the three-corner region at the intersection of the states of California, Oregon, and Nevada. MUH is part of the larger California, Oregon, Nevada Alliance (“CONA”) network that collectively serves around 250,000 patients. With 45% market share, CONA is the dominant health network in the three-state area. It competes with one other large private network, Tri-State Health (“TSH”), whose hospitals and clinics serve around 200,000 patients in the region. CONA, and by proxy MUH, enjoy a favorable payor mix, with 50% private payer contracts for physician and hospital services in 2021. There are multiple physician-owned practices in the tri-state area that serve patients from both large health networks, including a local private radiology group that owns an outpatient imaging center that is geographically proximate to the MUH.

MUH is known for its full spectrum medical practice that includes high-TQ services in oncology, neurosciences, orthopedics, and cardiology. Considered the highest-quality subspecialty referral center for the region, MUH provides patients access to national cancer trials, transplant surgery, Joint Commission-certified interventional stroke and cardiology programs, and high-volume joint replacement and women’s health services. To support the continued expansion of these flagship programs at MUH, there is a growing need for more imaging resources. MUH’s radiologists are hospital-based and university-employed. They are known for their subspecialty expertise and their highly ranked residency program in diagnostic and interventional radiology.

Most of the diagnostic imaging for MUH patients is performed at MUH hospitals and clinics, which also enjoy a reputation for high quality and state-of-the-art imaging facilities. For the last several years, however, growth in volume has outpaced access to MUH resources, and patients have had to wait up to

2 months to undergo non-urgent, elective examinations. Long wait times have led physicians at MUH to increasingly refer patients to the local private imaging center, which has generally been able to accommodate patients within 1 week of referral. In 2021, 10-15% of imaging studies have been referred outside of MUH and in 2022 it has been projected that 20% of imaging studies will be referred out.

MUH needs to expand its capacity for imaging while maintaining its brand for quality and do so in a cost-efficient manner. The MUH C-suite has suggested that the fastest and most cost-effective solution would be to purchase a local private imaging center and upgrade the equipment at this site. There is a second, alternative option to lease a property close to the main hospital and build out a new imaging center. To meet the growing demand for imaging, it is estimated that at least 2 new MRI scanners, 2 CT scanners, 1 PET-CT scanner, 2 mammography units and 4 US systems will be necessary. The lease terms are competitive, but the scanners, siting and construction costs are substantial. More importantly, it will take more than 2 years before the new center could be open to patients. A third-party consultant has developed a proforma for MUH that includes estimates for the up-front capital costs, revenue, operational expenses, and expected annual profit for the new center.

MUH has arranged a meeting with **Radiology Solutions Partners, LLC ("RSP")**, a physician-owned Radiology group, to negotiate the purchase of their outpatient imaging center. The practice is owned by 3 local radiologists who incorporated 10 years ago. At the time, they purchased the lease on a building approximately 2 miles from the MUH main hospital and secured loans to purchase 2 MRI scanners, 2 CT scanners, 1 PET-CT scanner, 2 mammography units and 4 US systems (the same footprint that MUH requires for its expansion). With its loans now fully paid off, the RSP Imaging Center is now fully owned and operated by the 3 partners. Over the last decade, patient volumes have increased significantly because of both growth in the market and the larger number of referrals from MUH and other physicians. To meet the growing demand, two additional radiologists have been hired by the group as employees over the last 2 years. Both are on track to join the partnership next year, with a \$250,000 buy-in each.

An external audit of RSP was recently completed, allowing a review of annual revenue, operational expenses, and profit for 2021. It was a challenging year for the partnership, which saw more than 20% decrease in annual study volume because of the pandemic. Even before COVID-19, negotiations with private payers had been an increasing challenge, and private payer mix had been eroded from 60% 10 years ago to only 40% in 2020, and the revenue per study has been in consistent decline. The scanners and other imaging resources in the RSP Imaging Center are now 10 years old and have lower image quality than MUH scanners and have been suffering from increasing downtime. The RSP partners have been discussing upgrading their imaging resources but are worried about the considerable costs, which would require securing a new business loan. Moreover, they perceive that their professional reputation among referring doctors has slipped over the years, as they are not familiar with some of the newer imaging techniques, had several high-profile quality issues, and have not participated actively in the professional community to the same degree as their MUH Radiology colleagues.

Although their business remained profitable through 2021, the partners are worried about further erosion in payer mix, increasing expenses to run their center and increasing competition. Rumors abound that MUH will be building their own outpatient imaging center a few blocks from their business that will compete with them. Having trained at MUH, they work well with the university radiologists, although they know that compensation for radiologists is less than their current earnings if they were to join MUH. They are motivated to sell their practice but recognize its current profitability and are reluctant to discount the value of the practice.

A consulting firm working with both MUH and RSP has valued the assets of the RSP outpatient imaging center at \$10M, with no current debt service or other liabilities. The RSP partners feel that the center is worth \$15M. Additional bullet points from the report issued by the consultants are as follows:

- The center is operated by 8 full-time technologists and 4 full-time office staff who are employees of RSP. Their contracts are annual.
- In addition to the 3 partners, there are 2 employed radiologists. All are board certified.
- The center typically performs 12,000 exams, collects revenue of \$6M and has practice expenses of \$4M annually, allocates \$500K towards capital purchasing each year. Because of the COVID-19 pandemic the center operated at a loss \$1.2M in 2020 and was break-even in 2021.
- Operational programs for the center were described as “acceptable, with several opportunities for improvement,” with recommendation for changes in the domains of management, scheduling, operating hours, and revenue cycle.
- ACR accreditation was not renewed last year for CT or MRI at the RSP Imaging Center.
- Current assets include a capital fund with \$1M in accrued cash value.

Can a deal be reached? If so, what are strawman negotiated terms for MUH to purchase the RSP Imaging Center and RSP to join the MUH group of hospital-based radiologists?

- ***Transaction model – full acquisition or merger/joint venture?***
- ***All-in cost for the transaction?***
- ***Does the agreement include a capital upgrade plan?***
- ***What is the disposition of the radiologic technologists and office staff?***
- ***Any employment assurances for the RSP radiologists or employees by the MUH radiologist group?***

In this case, you will take the role of the MUH team (the CEO, CFO and Radiology department head) or the RSP team (one of the 3 managing partners). As a part of the exercise, the MUH team and RSP team will first meet separately and then the two groups will meet for the negotiations.

Questions to consider for both groups before your negotiation:

1. What is the primary goal of this negotiation?
2. What are the principal points of self-interest for MUH and for RSP? Which are tangible and which are intangible? How would you prioritize these?
3. Describe the ZOPA and the reserve value for this negotiation. What is your team’s BATNA?
4. Develop 2 separate proposals that your group would be willing to accept.
5. How will you gauge the success of your negotiation?

Case Study #5

“Academic Radiology Departments Relationships with Industry”

Matthew A. Barish, MD

Judy Yee, MD

Case 5

Academic Radiology Departments Relationships with Industry

Matthew A. Barish, MD and Judy Yee, MD

For the following series of vignettes, you (along with the members of your table) are asked to place yourself into the role of a member of your Department's Executive Council. You are responsible for providing guidance to your Department Chair in each of the following scenarios. Your Chair has rarely gone against the Executive Council's recommendation so your decisions carry considerable weight.

This session's executive committee's meeting will focus on your department's (or an individual in your department) relationship with industry.

Scenario 1:

Your department is currently expanding both your clinical inpatient and outpatient MR facilities. You need to purchase several new MRI scanners. You currently have a mix of two MRI vendors (Admiral Eclectic (AE) and Mho MRI) but the majority of current scanners are from AE. Overall, your Radiologists are equally satisfied with both vendors' offerings. Pricing, site costs, operational costs and build-out are similar but **definitely** favor AE. AE machines currently enjoy a faster throughput in your department based on shorter protocols, tech familiarity with the platform, and shared protocols across all of the scanners.

However, you currently have a strong MR research program already in place, including several MD and PhD faculty, physicists, and physicians from outside the department. Nearly all of this research is conducted on Mho MRI scanners. This research is partially funded by Mho MRI and is based primarily on novel research sequences and/or coils available only on Mho machines. Mho MRI would agree to upgrade the current scanners to the latest software as part of the purchase of the new MRI scanners to keep all on the same platform.

You are currently finalizing the RFP and bid process.

Discussion (5 minutes)

1. Which vendor(s) would you favor to fill the contract?
2. Should you try to split the purchase between the vendors?
3. How much should your current research relationship influence your vendor choice(s) for your new MRI scanners?
4. Should you tailor the RFP to favor one vendor over the other?

By the way:

One of your PhD's just received a fundable score on a large NIH grant but only possible to carry out the grant on a specific vendor platform. Should this change your decision?

Scenario 2:

You are a member of the Senior Executive Committee of your Radiology Department at Tulittle Munny University. Dr. Anita Buck, a junior member of the department has been doing research in Artificial Intelligence and has been approached by a company (SkyNet) wishing to collaborate with her. They have offered to pay her \$100 per anonymized Head CT (including the redacted report) plus an hourly consulting rate to identify (fully outline) pathology in the images. In addition, SkyNet agrees to allow the use of software developed to detect intracranial hemorrhage in a research setting and for clinical use once 510k approval is obtained. The license will be for unlimited time during the research phase and for 3 years following 510k approval. At that point, the license will need to be purchased “at list price minus a 25% discount. Additional support and service agreement must also be purchased at the same terms”. Dr. Buck has told SkyNet she does not think there will be any problem and has been informally consulting for the company on her own time without compensation. She is asking for the Executive committee to allow her to go forward and begin working with the company.

1. Do you feel that the executive committee should make this decision or is this up to Dr. Buck alone?
2. What additional information would the executive committee need to know before discussing the potential collaboration?
3. Are there any red flags that already exist?
4. SkyNet sends details of the proposed agreement letter (see attached appendix)? Any concerns?

Scenario 3a:

Your facility is currently dissatisfied with its current PACS vendor. In an effort to keep your business, your current PACS vendor, recently upgraded your PACS system to the latest version. Although significantly improved, the CIO and hospital administration decides to change vendors to better integrate with the EMR and other hospital IT infrastructure. Immediately following the project kick-off, the new PACS vendor, Periphicity, wishes to come on-site with clinical applications and back-end engineers to document current workflow and IT procedures and processes in order to tailor the new system to the department, IT support and institutional needs. Periphicity asks to pair clinical applications personnel with various radiologists and technologists to understand and document current processes.

1. Does the committee have any concerns or issues with the process?

During the review period, several employees of Periphicity ask to understand how the old PACS vendor solved some key workflow issues. They ask if they can be paired with those hospital users with admin privileges to replicate some of the complex workflows. They begin to document the workflows, frequently with screen captures or cellphone pictures (HIPPA deidentified) of the current PACS menus, set-up functions, admin consoles, advanced features, and configuration files.

2. Does the committee have any concerns or issues with the process?
3. Do you notify the current PACS vendor of your processes?

Several of your current PACS vendor support personnel object to the competitor’s employees seeing detailed workings of the upgraded system and refuse to perform any support services while the new PACS vendor personnel are present.

4. How do you handle this?

Scenario 3b:

You recently purchase a new MRI scanner from a vendor you have not worked with previously. All is working well in most areas, however, many of the radiologists are dissatisfied with the quality of the diffusion images. They feel the quality of the diffusion is substantially better on the competitor's scanner. Several of your radiologists meet with the new vendor's clinical applications personnel and with their physicists to improve the quality of the scans.

1. Does the committee have any concerns or issues with any of the following requests?
 - a. The new vendor physicist asks for sample images from the competitor so they can understand the needs of the Radiologists.
 - b. They ask for a full set of images, DICOM format, (HIPPA compliant) performed on the original vendor scanner?
 - c. They ask to sit with the technologist at the competitor MR console during a patient or phantom scan.
 - d. They ask to scan a phantom on the competitor console while they access the competitor console.

Scenario 4:

The department is interested in hiring a new section head of Abdominal Imaging. You are looking for a mid-level career Radiologist with excellent clinical, administrative and research skills. You have several candidates, but have effectively narrowed it down to two very equal candidates, Dr. Andre Prenoor and Dr. Supe Cleen. One of the search committee members, Dr. Bize Baddi, has some concerns about one of the candidates because of certain entrepreneurial statements Dr. Prenoor made during the interview process. Dr. Baddi prints out a report of Dr. Prenoor's CMS Open Payments Data for the committee to review.

Year	Company	# Payments	Total Amount	%
2016	PFIZER INC.	115	\$359,145.00	99.1%
2016	GE HEALTHCARE	2	\$3,280.00	0.9%
2015	PFIZER INC.	11	\$46,625.00	84.5%
2015	ASTRAZENECA	2	\$6,000.00	10.8%
2015	EMD	1	\$1250.00	2.4%
2015	CELGENE	1	\$1300.00	2.2%
2015	COOK	1	\$32.20	0.1%

1. Should the executive committee or search (hiring) committees regularly review the data available in the CMS Open Payments database?
2. Should the results be used in hiring decisions?
3. Does research or other support in the CMS database reflect positively or negatively on the candidate?
4. Should the executive committee regularly review all current Radiologist data in the CMS Open Payments database?
 - a. If so, for what purpose?
 - b. What would you do with this info?

Scenario 5 (if time):

Dr. Bize Baddi, has some concerns about one of the Radiologists in your department. Dr. Baddi reports that one of your radiologists, Dr. Dreamy, has been seen frequently having dinner with a member of the management team of a company with whom you are currently doing business. Dr. Dreamy voluntarily reports that a social non-professional relationship has developed between the two of them.

1. Should the executive committee discuss this topic at all?
2. Is there a conflict of interest?
3. At what point (if ever), should a Radiologist (or other employee) disclose a social relationship with a vendor employee?
4. Most COI reports only ask for spouse or significant other relationships be reported. At what point should this be reported?
5. Should the executive committee recommend any notification to the company?
6. Does the individual radiologist need to be excluded from purchasing discussions involving the company's products?
 - a. What if the Radiologist is the department's expert in this particular area?
 - b. What if the Radiologist only advises but is excluded from final purchasing decisions?

Appendix

SKYNET DIAGNOSTICS INC. AGREEMENT

Account Name: Tulittle Munny Outpatient Centers

1. **Scope of Services.** SkyNet Diagnostics Inc. (“SkyNet”) hereby engages Tulittle Munny Outpatient Centers to be a consultant, and Tulittle Munny Outpatient Centers (hereinafter “Consultant”) accepts the engagement to provide services to SkyNet as described in more detail in Section 1 of Schedule A attached hereto (“Services”). In performing Services under this Agreement, **Consultant will report and be responsible to the SkyNet employee designated on Schedule A** and/or such other person(s) as may be designated by SkyNet. Consultant will faithfully perform the Services contemplated herein.
2. **Fee for Services.** In consideration of the Services rendered hereunder, SkyNet agrees to provide Consultant the fee indicated in Section 4 of Schedule A. The consideration provided herein (“Consideration”) will be the **sole form of a fee for services provided by SkyNet to Consultant in connection with the Services rendered hereunder.** Consultant and its employees, agents and representatives hereby **waive any right to royalties, additional fees or any other form of compensation** whatsoever from SkyNet for performance of the Services set forth on Schedule A.
SkyNet is entering into this Agreement with the understanding that any Consideration provided under this Agreement is intended solely to compensate Consultant for the Services stated in Schedule A.
3. **Consultant’s Representations and Obligations.**
 - a. Consultant represents that it has the requisite and necessary experience, equipment, facilities and personnel to perform the Services hereunder. Consultant represents and warrants to SkyNet that neither the entering into of this Agreement nor the performance of any obligations hereunder will conflict with or constitute a breach of any obligation of Consultant, under any other agreement or contract to which Consultant is a party or any other obligation by which Consultant is bound.
 - b. Consultant agrees not to reveal to any outside sources at any time during the term of this Agreement and for a period of ten (10) years thereafter, without SkyNet’s prior written consent, any matter learned in connection with performing the Services hereunder which could, in any manner, adversely affect SkyNet’s business, unless required by law to do so.
 - c. Consultant agrees to keep all necessary records relating to the performance of Services hereunder. Consultant further agrees that it will, at any time at SkyNet’s request, provide to SkyNet copies of any and all memoranda, books, papers, letters, notebooks, reports and any and all other data and information resulting from the performance of Services listed hereunder.
 - d. Consultant warrants that the provision of all Services hereunder will be in accordance with all applicable laws (including those related to equal employment opportunity).
 - e. Consultant acknowledges that any trade secret information, any copyrightable work product and any and all other intellectual property rights developed, derived from or otherwise generated by Consultant in performing Services hereunder **will be owned by and belong exclusively to SkyNet and will be deemed “works for hire”** (as that term is commonly understood and specifically defined under 17 U.S.C. §101). In the event such work product is not deemed to be a “work for hire,” Consultant hereby assigns to SkyNet the ownership of all rights, title and interest in such material, including, without limitation, inventions (whether patentable or unpatentable) and copyrightable work product, and SkyNet will have the right to obtain and hold in its own name, without obligation of any kind to Consultant, patents, copyrights, or other protection which may be available or become available with respect to such items. Consultant further agrees to give SkyNet and its designees or assignees all assistance reasonably required to perfect such rights, title and interest.
 - f. Consultant agrees to use the **Stroke Detector®** (hereinafter, “Device”) provided as Consideration under this Agreement in accordance with the User’s Guide and other product literature, and not to make any modification or alteration to the Device or otherwise take any action which would invalidate the manufacturer’s warranty.
4. **Disclaimer.** Except for indemnification obligations as provided under Section 8 of this Agreement, SkyNet specifically disclaims and Consultant waives any claim against SkyNet for liability of any type for any damages (whether special, direct,

or indirect, consequential, incidental or otherwise), relating to the Device provided under this Agreement, including, without limitation, expenditures, or loss of profits or projected profits.

5. Confidentiality. Consultant (and its employees, agents and representatives) will hold confidential and will not, directly or indirectly, disclose, publish nor use for the benefit of any third party or itself, any confidential or proprietary information of SkyNet, without first having obtained SkyNet's written consent to such disclosure or use; "confidential or proprietary information" includes without limitation know-how, scientific information, clinical development data, formulations, methods and processes, specifications and all other intellectual property. This restriction will not apply if the information has become public knowledge without fault on the part of Consultant (or its employees, agents or representatives).

Notwithstanding anything in this Agreement to the contrary, SkyNet reserves the rights to review the contents of any publication relating to any SkyNet product, including but not limited to the Device, in advance and to comment upon, but not make any editorial changes in, the results and conclusions set forth in the proposed publication. In no event may any confidential or proprietary information (as defined above) be published without SkyNet's prior written consent. SkyNet reserves the right to delay the publication of any material containing such information. Consultant agrees that any publication will acknowledge the efforts and contributions of any SkyNet personnel involved in accordance with customary scientific practice. Consultant agrees that SkyNet may freely use, copy and disseminate any publication without further obligation to Consultant.

6. Term; Termination. This Agreement will become effective as of the date this Agreement is fully signed by both parties and will continue for the term specified in Schedule A. The obligations of Sections 3(b), 4, 5 and 8 will survive any expiration or termination of this Agreement.

Except as otherwise specified in Schedule A, this Agreement may be terminated by either party without cause upon one (1) year's prior written notice.

If either SkyNet or Consultant breaches any representation or any of the terms of this Agreement, the other party will have the right to terminate this Agreement upon thirty (30) days' prior written notice to the defaulting party specifying the default; provided, however, if such defaulting party cures the default within such thirty (30) day period, this Agreement will continue in full force and effect as if no default had occurred.

7. Independent Contractor. Consultant is an independent contractor and does not have the authority to bind SkyNet in any manner without the express written authorization of SkyNet.

8. Indemnification; Insurance.

- a. General – by SkyNet. SkyNet will defend, indemnify and hold Consultant harmless from and against any and all damages, losses, costs and expenses (including reasonable attorneys' fees) arising out of any third party suit, action or proceeding for bodily injury, death or property damage related to Consultant's Services hereunder, *if and to the extent* such injury, death or damage is caused by SkyNet; provided, however, that SkyNet's obligations hereunder will not apply in the event that any such injury, death or damage was caused in any manner by Consultant or any of its directors, officers, employees or agents. The term "cause" includes without limitation Consultant's failure to follow instructions and/or protocols issued by SkyNet, Consultant's failure to follow any applicable governmental or institutional requirements, or any acts of negligence or willful misconduct by Consultant.

- b. General – by Consultant. Consultant will defend, indemnify and hold SkyNet harmless from and against any and all damages, losses, costs and expenses, (including reasonable attorneys' fees) arising out of any suit, action or proceeding relating in any manner to Consultant's performance of Services hereunder, unless and to the extent that such injury or damage is caused by any acts of negligence or willful misconduct by SkyNet.

- c. Indemnity for Infringement of Intellectual Property. SkyNet will indemnify and hold Consultant harmless from and against any and all claims alleging that the Device and any patent, trademark, copyright or other intellectual property relating thereto (hereinafter, "Intellectual Property") furnished by SkyNet as Consideration violate any third party's United States patent, trade secret or copyright, except to the extent that such claims arise from Consultant's modification or alteration of the Device or Intellectual Property or from Consultant's use of such Device in a manner inconsistent with the provisions set forth in this Agreement. However, SkyNet's liability hereunder shall be conditional upon

Consultant providing SkyNet with timely written notice of any such claim or threat thereof, and the full and exclusive authority for, and information for and assistance with, the defense and settlement thereof. If such claim has occurred, or in SkyNet's opinion is likely to occur, Consultant agrees to permit SkyNet, at SkyNet's option and expense, either to procure for Consultant the right to continue using the Device or Intellectual Property, or to replace or modify the same so that it becomes non-infringing. If neither of the foregoing alternatives is reasonably available, SkyNet may immediately terminate its obligations (and Consultant's rights) under this Agreement with regard to such Device or Intellectual Property or terminate this Agreement in its entirety (to the extent SkyNet is not able to provide the Device without such Intellectual Property).

- d. Notice; Counsel; Cooperation. Upon notice of any claim for which a party wishes to seek indemnification hereunder, such party will promptly notify the other in writing of the assertion of any such claim. Failure to provide such notice which substantially prejudices the indemnifying party's ability to defend such claim may invalidate any obligation of indemnification. Notwithstanding the foregoing, any party seeking to be indemnified will be nevertheless entitled to retain separate counsel at its own expense to participate in such matter; however, the indemnifying party will have sole case management authority; provided, however, Consultant, in the event acting as the indemnifying party, may not compromise or settle any matter without SkyNet's prior written consent, which may not be unreasonably withheld. Any party seeking indemnification will fully cooperate with the indemnifying party.
 - e. Insurance. SkyNet and Consultant agree to maintain insurance or a program of self-insurance in the types and with coverage limits adequate to fulfill their respective obligations hereunder, and upon written request, will provide the other party with proof of such insurance.
 - f. Survival. This Section 8 shall survive the termination or expiration of this Agreement.
9. Notices. Any notice required or permitted to be given hereunder must be in writing and must be either (i) delivered personally by hand, (ii) sent by registered or certified mail, or (iii) sent by a recognized qualified overnight delivery service. All such notices must be sent postage prepaid to the address of each party set forth herein or to such other address or addresses as are designated in writing in the same manner:
10. Miscellaneous. Any waiver, alteration or modification of any of the provisions in this Agreement or cancellation or replacement of this Agreement will not be valid unless in writing and signed by the parties. This Agreement (including Schedule A) contains the entire agreement between the parties hereto pertaining to the subject matter hereof, and supersedes all prior and contemporaneous agreements. The invalidity or enforceability of any term, provision, clause, or any portion thereof, of this Agreement will in no way impair or affect the validity or enforceability of any other provision of this Agreement, which remains in full force and effect. Consultant will not, without the prior written consent of SkyNet, assign or transfer this Agreement or any rights or obligations hereunder. SkyNet may assign or transfer this Agreement to a successor or affiliated organization; provided that in the case of any such assignment or transfer, the assignee or transferee will be bound by the terms and obligations provided in this Agreement.
11. Fair Market Value. The parties acknowledge and agree that the Consideration provided by SkyNet under this Agreement constitutes fair market value for the Services provided by Consultant under this Agreement.
12. No Requirement to Purchase. Consultant acknowledges that the Consideration provided under this Agreement is solely intended to compensate it for providing the Services. There is no requirement or pre-condition under this Agreement or any other agreement that Consultant purchase any items or services from SkyNet in exchange for receiving the Consideration.
13. Choice of Law. This Agreement, and all matters arising directly or indirectly hereunder, shall be governed by, and construed in accordance with the laws of the State of Confusion without regard for principles of conflicts of laws.

SCHEDULE A
CENTER OF EXCELLENCE AGREEMENT SERVICES SPECIFICATIONS

1. SERVICES TO BE RENDERED:

Consultant agrees to:

- I.
- a. Provide a minimum of 1000 Head CTs with all pathology identified in the images categorized as directed.
 - b. **Serve on the SkyNet speaker's bureau**, delivering a minimum of one (1) talk per device and/or program during the term of this Agreement. *
 - c. Act as an education site for the DEVICE, and facilitate visits for interested parties, with a minimum of twelve (12) visits per device during the term of this Agreement; average approximately one (1) hour per contact. *
 - d. **Participate in medical advisory board meetings** and provide general feedback and counsel on product development/roadmap, strategic planning and general input to market changing events and/or plans.
 - e. Report potential user issues, concerns or "bugs" and provide written feedback on SkyNet products, including but not limited to the DEVICE.
 - f. Designate individual(s) that would serve as a **site champion to address SkyNet** or customer inquiries and questions about SkyNet products, including but not limited to the DEVICE, either by way of phone calls and/or e-mail within a pre-arranged and mutually agreeable process (twenty-four (24) hours per device during the term of this Agreement, i.e. approximately forty (40) minutes per month per device per year).
 - g. Participate in clinical evaluations and/or clinical trials per a mutually agreed upon process that is consistent with national clinical trial practices.*
- OR
- II. Generate a minimum of one (1) white paper per device during the term of this Agreement, highlighting its experience, use and benefits of DEVICE in routine clinical settings.

* Consultant may provide these Services in greater or lesser amounts or frequency; provided, the aggregate fair market value of all such Services remains the same.

2. TERM:

Three (3) year term commencing on the date this Agreement is fully signed by both parties.

3. DESIGNATED SKYNET EMPLOYEE FOR REPORTING PURPOSES:

Dr. David Bown
Vice President of Marketing
SkyNet Diagnostics Inc.

4. NATURE AND TYPE OF CONSIDERATION:

SkyNet will pay \$100 per Head CT (including the redacted report) plus an hourly consulting rate of \$ _____ to identify pathology in the supplied images.

In exchange for testing of the DEVICE and for services outlined in Schedule A 1b-g OR Schedule A II, SkyNet agrees to allow the use of the DEVICE developed to detect intracranial hemorrhage in a research setting and for clinical use once 510k approval is obtained. The license will be for the length of this agreement for research use and for clinical use for 3 years following 510k FDA approval. At that point, the license will need to be purchased at list price minus a 25% discount. A separate support and service agreement must also be purchased at the same terms.

ACCEPTED AS SCOPE OF PROJECT

Case Study #6

“Designing the Academic Mission in an Era of Constraints”

Reed A. Omary, MD, MS

Lori A. Deitte, MD

Robert Ryu, MD



The Power of Design Thinking in Medical Education

Lori A. Deitte, MD, Reed A. Omary, MD, MS

A goal of medical education should be to optimize educational experiences of our learners. How can we better understand their experiences and design educational activities that inspire them to learn? Design Thinking is a powerful process that consists of five iterative phases: empathize, define, ideate, prototype, and test. Empathy with the user experience is at the core of Design Thinking. This helps define the right problem so that the right solutions can be developed. In this article, we share our experiences with using Design Thinking in radiology education. As educators, we are constantly learning and innovating. Design Thinking provides a powerful process and a growth mindset to help develop creative solutions as we move forward. We invite you to join us in this discovery quest for innovative solutions in medical education through the Design Thinking process.

Key Words: Medical Education; Design Thinking; Curriculum Design; Radiology Education; Radiology Residency; Ultrasound Curriculum; Graduate Medical Education.

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INTRODUCTION

Imagine you are an early career radiology faculty member asked to develop a 2-week required radiology course for third-year medical students. You are honored to have the opportunity to develop this course but have limited experience in curriculum development. You schedule a meeting with more experienced radiology faculty to brainstorm about the curriculum. The group decides that the course should include daily conferences on imaging modalities, appropriateness criteria, and/or radiograph image interpretation as well as 2-hour blocks in the subspecialty reading rooms each morning and afternoon.

You spend months preparing conferences for the course and cannot wait for it to start. Finally, the first day arrives. You deliver the first two conferences and then direct the medical students to their assigned subspecialty reading rooms.

After the course is completed you are excited to receive the first set of evaluations. Imagine your disappointment when you read student comments that the 2-hour reading room blocks are often “boring” and that students are afraid to ask questions because they might “disturb the clinical flow.”

Although you have already invested much time and energy into developing this course, you decide to reconsider the approach. One of your colleagues recently attended a Design Thinking workshop and agrees to help you use a Design

Thinking approach to redesign the medical student radiology reading room experience.

Instead of brainstorming with faculty about course content, you start by having conversations with medical students to better understand their experiences in the reading room. You learn that the first challenge for students is feeling welcome and finding someone to sit with. Students share that they do not have defined reading room roles or responsibilities and often end up sitting passively listening to radiologists dictate, which can be boring. Students express concern that asking too many questions slows radiologists down and disturbs the workflow.

You use this information to better understand “pain points” of the medical student reading room experience. This helps you reframe the question from “What content is important for the course?” to “How might we make the medical student reading room experience more engaging?” You and your colleague then invite medical students, residents and faculty to a Design Thinking session to ideate about creative solutions that can be prototyped and tested. This experience whets your interest in the Design Thinking process and future applications in medical education.

THE DESIGN THINKING PROCESS

The term “Design Thinking” has been present since at least 1987 (1) and has a long history of use in engineering (2), business and management (3–5), and health care (6). More recently, Design Thinking has been used in education (7–9). The literature includes a wide variety of books, scholarly articles, and articles in mainstream media. Design Thinking blends a mindset for empathy with a process of iterative human-centered design. Overall, the objective is to help foster innovation in fields that deliver a product and/or service.

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How is Design Thinking different from other types of brainstorming? A typical brainstorming session often involves a group discussion to develop creative solutions to a problem. Group participants can range from extroverts with a tendency to dominate the discussion to introverts who have creative ideas but may be hesitant to speak up. In contrast, with Design Thinking, every participant has an equal voice. Rapid-fire ideas are initially created in silence by each participant on post-its, which are then placed on a wall or whiteboard for group viewing. The group then votes on the ideas and determines which “big ideas” to further develop. This approach gets around pre-existing biases or mindsets by bringing diverse voices into the process. Simple questions such as “why”, “what if”, and “how might we” are asked to define a more interesting question and develop superior solutions (10).

Although variants of the Design Thinking process can be applied to different settings, all share a common goal of designing human-centered solutions to enhance the user experience. For this paper, we will focus on the five-phase Design Thinking model used at the Hasso Plattner Institute of Design at Stanford (11). In this model, individual ideas are communicated on post-its, and every participant is encouraged to generate as many ideas as possible.

The five Design Thinking phases are:

- 1 Empathize
- 2 Define
- 3 Ideate
- 4 Prototype
- 5 Test

Empathize

In the design process, the user is the person that the application, product or service is designed for. In medical education, the user is the learner. Empathy and understanding the user experience are at the core of Design Thinking. In fact, the empathy phase helps differentiate the Design Thinking process from other types of brainstorming or problem solving. The user experience refers to the emotions, attitudes, and overall satisfaction of the user when interacting with a product or service. In our medical student course example, the user was the medical student and empathy building was facilitated through conversations with students about their reading room experiences. Other potential methods include: directly observing the user experience, asking for feedback, listening to user stories, meeting with focus groups, and analyzing each step of the user experience.

Another method that we have utilized to understand the user experience involves creating a persona and an empathy map. For example, the persona “Catherine Smith is a fourth-year medical student from Alabama interviewing for a radiology residency slot in Massachusetts. She describes herself as shy but curious with a desire to make a positive impact on others. This is her first radiology interview experience and she’s not sure what to expect.” Based on this persona, each member of the

Design Thinking group writes their ideas on post-its, one idea per post-it, representing what they think Catherine “says, thinks, does and feels” as she prepares for the interview day. The post-its are placed on a four-quadrant board called an empathy map (Fig 1), which is then used to help identify issues that might impact Catherine’s interview experience.

Define

Understanding the user experience from different perspectives helps frame the problem in a user-centered manner. With our medical student radiology course example, after having conversations with multiple medical students, the problem was reframed from a content centered focus to a reading room experience centered focus. A goal of this phase is to define the right problem so that the right solutions can be developed. This often results in asking a “how might we” question: “How might we make the medical student reading room experience more engaging?”

Ideate

The goal of the ideate phase is to generate a broad range of ideas nonjudgmentally. Ideas are communicated on post-its and all perspectives are welcome. Participants are encouraged to go beyond the usual solutions and explore creative options. Providing constraints can help spark novel ideas. In our medical



Figure 1. Example of a four-quadrant empathy map to help understand the user experience. The post-its reflect ideas about what the user says, thinks, does and feels. (Color version of figure is available online.)

student course example, consider the following constraint: an attending radiologist can only dedicate 10 minutes to teach medical students during their 2-hour reading room block. Solutions might include providing a simulated environment for medical students to dictate preliminary reports to review with the radiologist, pairing medical students with an ultrasonographer or another technologist to participate in the acquisition of imaging exams to review with the radiologist, and assigning cases for medical students to review on their devices and then discuss with the radiologist.

This initial divergent phase encourages people to think divergently to generate as many ideas as possible, no matter how crazy. This is followed by a convergent phase of ideation when participants group ideas with a similar theme together and vote on the grouped ideas, ultimately identifying two or three ideas that are then carried forward for further development in the prototype phase (8). In the divergent phase, we create choices (“no ideas are bad”); however, in the convergent phase, we make choices (“let’s select only the best ideas”).

Prototype

The goal of the prototype phase is to experiment with developing the best possible solutions for the identified problems. This is the action phase. Quick inexpensive prototypes are developed, tested, and refined or discarded based on user feedback. A prototype can be a physical object that the user can interact with or a role-playing scenario that involves the user. A mantra of Design Thinking is to “fail fast” before becoming too invested in a single solution.

Test

The test phase provides an opportunity to solicit feedback from the user. The goal is to better understand and empathize with the user experience to refine the prototype, resulting in better solutions. This is an iterative process. In our medical student example, we might prototype a simulated environment for medical students to dictate reports and make modifications based on feedback. Or we might decide that this is not the best solution and move on to another prototype to engage students in the reading rooms.

DESIGN THINKING IN MEDICAL EDUCATION

We have used Design Thinking in our department and education programs for three years. Staff, medical students, residents, and faculty have all participated in Design Thinking sessions hosted by our department. A recent session focused on redesigning the radiology resident ultrasound experience. This was initially prompted by a review of comments on resident surveys and ultrasound rotation evaluations. Conversations with residents confirmed a desire to redesign the ultrasound experience to be more engaging.

A Design Thinking approach was used to ideate about potential solutions. Residents and faculty were included.

Participants identified resident “pain points” and subsequently generated rapid-fire ideas on post-its for redesigning the resident ultrasound experience. The group voted on these ideas and identified the following top “big ideas”: (1) Ultrasound boot camp, (2) Simulated scanning sessions with standardized patients and ultrasound-guided procedure sessions, (3) Procedure time with nurse practitioners to learn basic ultrasound-guided procedures such as thoracentesis and paracentesis, and (4) Updated noon conference content and format. New resources were developed including an introductory video on ultrasound transducer selection and scanning techniques. A 1-week boot camp was designed that included activities and resources, such as a compendium of relevant articles and practice cases for ultrasound call preparation. New hands-on ultrasound experiences were introduced into the rotation and at the simulation center. The rotation was restructured to include procedure time with nurse practitioners. Noon resident conferences were updated to be more relevant and engaging. These changes have been in place for two years now with slight modifications in resident conferences and the timing of the simulation experiences based on resident feedback via conversations and conference evaluations.

In our experience, this Design Thinking approach has several advantages over a more traditional hierarchical top-down approach for designing education experiences. Design Thinking starts with empathy for the user (learner). Every participant has an equal voice. The voices of introverts are amplified, and power differentials are neutralized. This approach results in a mindset of empathy, inclusion and empowerment, ultimately fostering the development of superior solutions.

CALL TO ACTION

A goal of radiology education should be to optimize educational experiences of our students and trainees. How can we better understand their experiences and design educational activities that inspire them to learn? Design Thinking is a powerful process that places the user experience front and center. This iterative approach engages the user with developing and refining solutions.

Empathy with the user experience is at the core of Design Thinking. This helps define the right problem so that the right solutions can be developed. All voices are “heard” through ideation with post-its. All proposed ideas are initially considered and then narrowed down by consensus to a smaller number of ideas that are carried over to the prototype phase. The Design Thinking process embraces a “bias towards action”. The prototype and test phases allow designers to “fail fast” and refine the prototype or move on to the next idea.

For those of you who have already participated in a Design Thinking experience or workshop, we invite you to try Design Thinking techniques in education. It’s not necessary to include all five steps in a single session. Perhaps start with inviting interested residents to your next

departmental education meeting and use post-its to “hear” everyone’s ideas during a discussion on the resident education experience.

For those of you who have not yet participated in a Design Thinking experience, we invite you to give it a try. Initially, you may feel a little out of your comfort zone, which is true of many growth experiences. However, Design Thinking soon becomes a mindset, a new way of problem solving and finding innovative solutions to problems in education.

As educators, we are constantly learning and innovating. Design Thinking provides a powerful process and a growth mindset to help develop creative solutions as we move forward. We invite you to join us in this discovery quest for innovative solutions in medical education through the Design Thinking process. What will you do?

ACKNOWLEDGMENT

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Keynote Speaker

“Transformational Leadership Through A
Coaching Lens”

Neil M. Rofsky, MD

Case Study #7

“Academic Radiology Expansion into Regional Practice”

Jocelyn D. Chertoff, MD, MS, FAUR

Academic Radiology Expansion into Regional Practice

Jocelyn D. Chertoff, MD, MS

Country Mouse

Dr. Hermione Granger is the recently appointed chair of an academic radiology practice in a very rural state, with extreme weather, long distances between towns, and limited internet services. There is a new CEO, Dr. Gryffindor, who is very concerned about reimbursement and the poor contribution margin of the last few years, and is taking an aggressive approach to consolidation and commoditization of medical services. He is happy with what Radiology is doing but wants to see more of it. Both Dr. Gryffindor and Dr. Granger are aware of the delicate balance between fee for service and capitation and are trying to maximize the benefits of the current system but be poised to manage if/when the system becomes more capitated.

At the academic medical center, located next to a college town with excellent schools and high expectations for quality care, the Radiology Department is small, but subspecialized, offering a full range of services. During the day, most reads are by subspecialists. From 5pm to 9pm, there is an Interventional Radiologist on call for IR, and a Neuroradiologist in house reading neuroradiology. There are two non- neuroradiology, non-IR Radiologists who reads everything else, prioritizing the stat and emergency cases, one from 5-7PM and one from 5-9 PM. When there is a highly subspecialized case that they are not comfortable reading, they either do a preliminary read or call for help. From 9 pm to 8 am there is an Emergency Radiologist who reads almost everything and an IR Radiologist on call. On the weekend, there is an Interventional Radiologist on call, and a Neuroradiologist and two or three non- neuroradiology, non-IR Radiologists who determine their own schedule to cover from 8 am to 9 pm, and an Emergency Radiologist from 9 pm to 8 am. There is always an IR resident on call, and an on-call resident in house. The department has 43 Radiologist (but fewer FTEs there is a range of 0.4 to 1.0 FTE) at the main hospital, 20 residents, 3 ACGME-accredited fellows and 1-2 non- ACGME-accredited Imaging fellow. They are currently and frequently recruiting.

The AMC has had a long standing relationship with Hogsmeade Hospital, where one Radiologist is on site 5days/week. This relationship and contract will soon expire. At 3 very distant hospitals (the Durmstrang Group), there were two Radiologists, working 1.6 FTEs, with 1.2 FTEs are on site, the rest being read by teleradiology. Due to retirement and attrition, filling the on-site staffing has become a very difficult problem and Dr. Granger is trying to think outside the box. Most of the work is being done by teleradiology, to the dissatisfaction of the site, despite continued excellent turn-around time and 24/7 reads. At Beauxbatons Hospital , there is a Radiologist on site 4 days/week, or 0.8 FTE, spending 0.2 FTE at the AMC, with the nonstaffed day read by teleradiology. At Quidditch Hospital , there are two Radiologists, 2.0 FTEs, with teleradiology coverage for vacation. All of these locations are covered from 5 pm to 8 am, and on the weekends by teleradiology at the AMC, with assigned participation by the regional Radiologists to assist. Vacation and other coverage is accomplished either through travel or teleradiology, delineated by contract. All of these locations have Emergency Departments. None of these have the same IT systems as the AMC, and all have required individual management to allow the

AMC Radiologists to read their studies off the integrated worklist. Hogsmeade cases still have to be read off a stand alone work station, to the great dissatisfaction of the radiologists.

In the last year, four additional hospitals were added to the system. This was previously covered by a local private practice. That group had 5 Radiologists with one at each site every day, and one always away or on vacation. They used a nighthawk service, and did final reads the next day. The 4 hospitals shared a PACS, which was almost out of storage. They did not have voice recognition, and due to the delay in the final report, their workflow included a great deal of direct, undocumented communication. The change has required close attention to the culture, practice and workflow of the group,

All of the regional radiologists are hired and paid by the AMC where they are members of the active clinical staff and have appointments at the Hogwarts School of Medicine. They send anything they are not comfortable reading to the AMC. The Durmstrang group hospitals pay a flat fee for the reads, adjustable every 3 years, while in the others the AMC has taken on the professional billing.

There are three small departments in the southern part of the state, with 1, 2 and 3 Radiologists each, all of which are part of the AMC system, none of which are open nights or weekends and none of which have an Emergency Department. They previously functioned as largely independent private practices, but they are becoming integrated into the Radiology department and they are currently supervised by Dr. Granger, through her Associate Director, Dr. Weasley, who works at one of these locations. While they read most of the work generated locally, they send excess or subspecialty cases to each other or to the AMC via teleradiology as needed. These can be read from the integrated worklist. Dr. Granger expects is not responsible for the technical of the practice, and sees little data. Despite her responsibility for the professional component, 5 of the 6 radiologists are “grandfathered”, and do not share in after hour coverage responsibilities. They have more vacation and 3 have a highly advantageous compensation plan.

Dr. Gryffindor and Dr. Granger agree on the strategy of the AMC Radiology department leadership managing and growing the outreach work and they plan to repeat this process throughout the state and possibly adjacent states as well.

There are two other complex areas of change right now:

1. The compensation plan was changed to one that is entirely determined by RVUs, with a reduction in nonclinical time. Dr. Granger is concerned that this will lead to anxiety, abandonment of low RVU work and poor patient care in the academic environment and resentment in the regional practices.
2. The research and academic components of the medical school and the medical center are being closely scrutinized and funding is uncertain.

Additionally:

1. There is a large hospital currently affiliating with the AMC. They have a 2.5 person private practice Radiology group, while the rest of the professional staff is either employed, or soon to

be, by the AMC. The AMC wants Dr. Granger to manage this group, although their contract specifically exempts them from any direction by the AMC. The relationship with the AMC has markedly increased imaging volumes, for which they receive the professional billing. Dr. Granger has begun discussions with and about this group.

With the recent changes, the total imaging volume has grown from ~420,000 to ~500,000 exams.

City Mouse

Dr. Jean-Luc Picard is the Chairman of an Academic Medical Center (AMC) in Vulcan, a major metropolitan city that has six Medical Schools and five health systems. Dr. Picard's Department has historically been responsible for imaging services at two hospitals owned by his medical center in Vulcan. Two years ago his AMC acquired a community hospital in Argus, a suburb of Vulcan accessible by public transportation. Dr. Picard's department is also responsible for imaging services at several imaging centers in Vulcan and Argus. Total volume at the hospitals and imaging centers is approximately 1.2 million exams per year. Dr. Picard's department consists of approximately 130 academic radiologists divided into 9 subspecialty sections. Each section covers the hospitals and the imaging centers located in Vulcan or Argus through a combination of onsite radiologists and teleradiology.

Two of the hospitals are level 1 trauma centers, one in Vulcan, and one in Argus. The department's emergency radiology section covers the emergency departments in Vulcan and Argus from the hours of 7 PM to 8 AM with the other subspecialty sections covering from 8 AM to 7PM. The emergency radiology section consists of 16 faculty, 4 traumatologists, 6 neuroradiology fellowship trained radiologists and 6 body fellowship trained radiologists. There is no onsite radiologist at the hospital in Argus in the evening and overnight hours- cases are covered via teleradiology and a "virtual consult" system.

All of the imaging centers and hospitals in Vulcan and Argus are on the same IT infrastructure. The Department has a well-established quality and safety infrastructure with common and standardized policies, workflows, and protocols across all of its imaging sites. The department has a strong GME program with 40 residents and 27 fellows.

The AMC has recently completed an acquisition of a large community based hospital with an associated residency located in Alpha Centauri . Travel time from Vulcan to Alpha Centauri, depending on traffic, can take between 1 and 2 hours and there is limited public transportation accessibility. This hospital historically had an in-house radiology department with 30 radiologists divided into subspecialty sections but the subspecialties divisions are much broader and less rigid than at the academic medical center. For example, all radiologists are responsible for interpreting all radiographs and all radiologists other than neuroradiologists and interventionalists are responsible for reading all body cases on call. The current Radiology Chairman has announced that he will be leaving when the acquisition is complete. The hospital has a very busy level 1 trauma center. The residency consists of 20 residents. Dr. Picard has been told by his Dean, Dr. Kirk, that he will be responsible for the community hospital's radiology department once the acquisition is complete. His mission is to make sure that the patient experience and quality of imaging is identical at the community hospital and the AMC. Imaging volume at the hospital is approximate 300,000 cases per year. The hospital is a busy level 1 trauma center. The IT infrastructure at this hospital is currently independent of the IT infrastructure of the rest of the AMC.

The long string of legislative and CMS mandated reimbursement decreases have led to an extremely unsettled environment for independent imaging centers in and around Vulcan. Several centers have closed while others have been acquired by national imaging center "chains". Dr. Picard has recently completed the acquisition of two separate groups of imaging centers in Alpha Centauri that consist of

13 imaging centers with a total volume of 500,000 exams per year. Collectively between the two groups, there are approximately 60 radiologists. All are fellowship trained and although they try to read primarily within their subspecialty, they are not divided into subspecialty sections and routinely read all types of images. Each imaging center group has separate RIS, PACS and voice recognition systems.

The revenue received by the department for its services depends on whether the imaging sites are “owned” by the AMC’s Hospitals or the Faculty Group Practice of the AMC. All “faculty group practice” owned sites are considered part of the department. This translates into the department paying all the salaries and other costs of imaging at the sites, performing the global billing for the sites and collecting all the imaging revenue from the sites. The department bills for and collects only for professional services performed at all AMC owned sites.

Dr. Kirk is very supportive of Dr. Picard’s entrepreneurial ventures but with the caveat that brand protection and standardization of patient experience is paramount. He has told Dr. Picard that he has to ensure that there is no difference in quality and patient experience at any imaging site that is run the by the AMC and that he will hold Dr. Picard personally responsible for any lapses in quality or damage to the brand.

Case Study #8

“Academic Health Center Staffing: Making DEI Part Of The Conversation”

Marta E. Heilbrun, MD

Jamlik-Omari Johnson, MD

AUR Management Course

Case 8: Academic Medical Center Staffing: Introducing DEI to the equation

Presenters: Marta Heilbrun, MD & Omari Johnson, MD

Task: Address staffing in your hospital-based radiology practice in a multi-hospital, urban integrated Academic Health System (AHS), BestOf Healthcare. You are being asked to define mechanisms/shift staff or resources to provide 24-hour faculty coverage at all hospitals.

Background: Paradox, the city where BestOf Healthcare is located, is in the top 10 of US cities for the number of Fortune 500 company headquarters and in the top 15 of all large cities for starting a new business. Paradox's violent crime rate is in the top 25 of all major cities in the US. More, 20% of the urban population lives in poverty, although that number has been declining with investment in urban renewal/gentrification. Paradox is in the top 5 cities for income inequality, ranking #1 in 3 of the most recent 10 years. The city hosts multiple professional franchise sports teams, including MLB, NBA, WNBA, NFL, NHL, and MLS. The MLB team is a recent World Series winner, and the NBA team makes it to the finals regularly but has not won in years.

BestOf Healthcare is part of a private university, Fabulous University (FabU), which consistently has a top 20 ranking for NIH research funding.

The Mission, Vision, Value statements of BestOf Healthcare are as follows:

Mission: Improving the health of individuals and communities at home and throughout the world.

Vision: Be the leading academic health science center in transforming health and healing through education, discovery, prevention and care.

Values

- We exemplify excellence, innovation and collaboration.
- We treat everyone with respect, caring, and compassion.
- We embrace diversity, equity, and inclusion.
- We steward our resources responsibly to optimize value.
- We serve with integrity.

Your radiology department provides comprehensive radiology clinical staffing for 3 hospitals that serve the city. The department has 11 clinical divisions with 100 faculty radiologists. The training program has 56 residents, including DR/IR, and 20 fellows. There are a handful of physician extenders who work primarily in IR. The department self-funds 2 of the resident positions/year (8 total) and 16/20 of the fellow positions.

The major characteristics of the 3 hospitals are presented in Table 1. Table 2 describes patient characteristics of the 3 hospitals. InnerCity Hospital is in the downtown area. University

Hospital is on the same campus as the FabU's School of Medicine (SOM), the undergraduate school and other graduate schools. Suburban Hospital is in the area with the highest socioeconomic indicators. InnerCity Hospital is on a separate EMR/PACS from the other BestOf Hospitals.

InnerCity Hospital is a training site for BestOf Healthcare as well as the SOM at Excellence University (ExU), a Historically Black College and University (HBCU). All attending physicians at InnerCity have faculty appointments from either FabU or ExU. ExU has residency programs for core programs, including Internal Medicine, Surgery, ObGyn, Family Medicine, but not Radiology or many subspecialties. There are no radiology faculty in ExU's SOM and there are no radiology rotations for ExU's medical students or housestaff.

As a department, the BestOf Healthcare's faculty's average clinical productivity is at the 65th %ile based on the AAARAD survey and salaries are targeted to the 55th %ile for private AHS radiology practices. Faculty receive approximately 70% of expected non-clinical time, including academic and administrative time, as well as time for meetings and vacation, however that number was 85% 5 years previously. All divisions are actively recruiting. All faculty have academic appointments and are expected to be promoted based on academic productivity/reputation. The AHS has recently created a mechanism to recognize those who serve primarily the clinical mission.

The residency program is consistently ranked in the top 10 in national surveys. The ABR core exam first time pass rate is 85%. Between 50-60% of trainees stay on to do their fellowships with BestOf Healthcare. There is buzz that the trainee call burden is on the high end and that it might be limiting other learning opportunities. Specifically, within the last year, trainees have raised concerns about the volumes at InnerCity Hospital, especially in the ED during the after-hours and weekend shifts, putting patients at risk and leading to resident and faculty burnout. The overnight clinically significant resident discrepancy rate has been trending upwards at InnerCity Hospital. An easier system was put in place to record discrepancies, and faculty are now provided feedback and encouragement in relation to their use of the resident report reconciliation tool.

In the current state, InnerCity Hospital is covered by faculty from 7AM until 1AM and has 24-hour trainee coverage. University and Suburban Hospitals have 24-hour faculty coverage. University Hospital has 24-hour trainee coverage as well. Table 3 describes the shift distributions and Table 4 describes the volumes, TAT and rate of trainee involvement in radiology reporting.

Data Describing the 3 Hospitals

Table 1: Services/clinical characteristics for the 3 Hospitals

	InnerCity Hospital	University Hospital	Suburban Hospital
Safety Net designation	X		
Level I Trauma	X		
Comprehensive Stroke Center	X	X	
Level I Emergency Cardiac Care			X
Burn Unit	X		
NCCN Designated Cancer Center		X	X
Major Organ Transplant Programs	Kidney	Heart, Liver, Lung, Kidney, Pancreas	Heart, Kidney

Table 2: Patient Characteristics for the three hospitals

	InnerCity Hospital	University Hospital	Suburban Hospital
Payor Mix			
Medicare	30%	35%	45%
Medicaid	30%	10%	10%
Commercial	15%	50%	35%
Uninsured/Self-Pay	25%	5%	10%
Self-Reported Race			
Black	70%	30%	10%
White	10%	60%	50%
Asian	5%	15%	20%
Other	15%	5%	20%

Table 3: Trainee to Faculty Shift distributions for the 3 hospitals

	# Daytime Shifts		# Weekday Afterhours Shifts		#Weekend Shifts		Totals/ Location
	Faculty	Trainee	Faculty	Trainee	Faculty	Trainee	
InnerCity Hospital	12	20	1	4	3	8	48
University Hospital	25	26	2	2	2	4	61
Suburban Hospital	20	3	2	0	3	0	28
Totals/Shift	57	49	5	6	8	12	

Table 4: Volumes and Turn Around Time for the 3 hospitals
(Excluding Breast, IR, Peds and Nucs)

	InnerCity Hospital	University Hospital	Suburban Hospital
Avg Monthly Volume			
Overall	19330	16500	10200
CT	6500	4600	3600
MR	780	1400	1000
US	1550	1500	1000
XR	10500	9000	4600
% read with trainee	60%	40%	10%
ED TAT Complete to Final	5 hours	45 minutes	35 minutes

Additional Facts/Issues

- Few faculty are hired specifically to staff InnerCity Hospital. Each division is responsible for deploying faculty to coverage sites.
 - InnerCity Hospital's leadership has repeatedly stated a preference for faculty who provide care there to have it be the place where the majority (>50%) of their effort is allocated.
- Approximately 70% of faculty have home workstations (HWS). Of these, 20% have HWS that work for all hospitals, 5% have HWS for only InnerCity Hospital, and the remainder have workstations that only work for University and Suburban Hospitals.

- Remote workstations for InnerCity Hospital are in multiple reading rooms at University Hospital.
- Faculty salaries and benefits are established at a department level, such that there is rank based base-salary equity, regardless of which hospital is the primary practice site for an individual radiologist.
- Incentive pay is variable.
 - Faculty with significant clinical and administrative effort allocated to InnerCity are eligible for approximately 10% less of the clinical incentive, because this is allocated from the physician group practice that only recognizes effort allocated to University and Suburban Hospitals.
 - Faculty with significant non-clinical effort (e.g. Funded Research or Administrative responsibilities) are eligible for a smaller pool of the clinical effort, but usually make it up in the other portions of the incentive plan related to academic and service metrics.

Faculty Biosketch Information

BIOSKETCH – Matthew A. Barish, MD

Dr. Barish graduated Summa Cum Laude from Boston University with a BS in Biomedical Engineering; he graduated Alpha Omega Alpha from Boston University School of Medicine. During his Residency at Boston Medical Center, he was Senior Chief Resident. His fellowship in Abdominal Imaging, with an MRI focus, was completed at Yale-New Haven Hospital, CT. Following fellowship, Dr. Barish was appointed Assistant Professor of Radiology at Boston University School of Medicine where he held the positions of Section Head of Abdominal Radiology, Director of MRI, Director of Radiology Operations, Director of Quality Assurance, Assistant Residency Program Director, Clinical Service Coordinator and Vice Chair of Radiology.

Dr. Barish was the Chief Medical Officer of Voxar Ltd, one of the largest providers of 3D software integrated directly into the PACS. He has two patents for co-developing two novel techniques for image processing.

Dr. Barish was the founder and director of Brigham and Women's Hospital's 3D and Image Processing Center. This center streamlined the 3D processing for the Department of Radiology as well as providing additional direct services to the departments of neurosurgery, orthopedics, vascular and cardiothoracic surgery. Subsequently he was appointed as Assistant Professor of Radiology at the Harvard Medical School as well as appointed to the position of Specialist, Business Development for the Department as well.

At the Dana Farber / Harvard Cancer Center, Dr. Barish established the Tumor Imaging Metrics Core, a new DF / HCC Core Facility, receiving the Partners Radiology Research Committee 2004 Collaborative Research Grant, between the Massachusetts's General Hospital (MGH) and Brigham and Women's Hospital.

Dr. Barish co-authored one of the first comprehensive peer-reviewed qualification studies of CT Colonography, published in the NEJM. Dr. Barish developed the first physician training course in CTC in 1998, is the founder of the Hands-on Training Course at the American College of Radiology Education Center and has trained over 600 practicing Radiologists and Gastroenterologists in the reading of CT Colonography and Virtual Colonoscopy.

Dr. Barish was the Vice Chair of Radiology Operations, Director of MRI, and co-Chief of Body Imaging in the Department of Radiology at Stony Brook University Hospital and School of Medicine. He held the academic title of Associate Professor of Clinical Radiology. In 2000, Dr. Barish moved to Northwell Health as the Vice Chair of Informatics, Radiology Service Line, responsible for the technology infrastructure for Northwell's 22 hospitals and 19 outpatient-imaging facilities.

BIOSKETCH – Jocelyn D. Chertoff, MD, MS, FAUR

Dr. Chertoff is Professor of Radiology and of Obstetrics and Gynecology at Dartmouth Hitchcock Medical Center. She is Chair of the Department of Radiology and Vice President of the Regional Radiology Service Line. She was the Program Director for the Diagnostic Radiology Residency for 17 years. She is past Chair of the Board of Directors of the Hitchcock Foundation. Dr. Chertoff recently joined the Board of Directors of Varex Imaging Corporation.

She grew up in New York City and graduated from Brown University, then from University of Vermont College of Medicine. Following a Transitional Internship at Hartford Hospital and a Pediatric Internship at University of Connecticut Health Sciences Center, and after spending two years in a physician shortage area in New York State, and serving as the Medical Director for Vermont EMS, she returned to the Medical Center of Vermont for a Residency in Radiology and a Fellowship in Cross-Sectional Imaging. She came to Dartmouth-Hitchcock Medical Center after completing her training in 1991. She was a 2003-2004 Fellow of the Hedwig van Ameringen Executive Leadership in Academic Medicine (ELAM) Program for Women, and she received a Master's degree from the Center for the Evaluative Clinical Sciences at Dartmouth College in 2005. She completed a Master's of Health Care Delivery Science a joint Master's program between the Tuck School of Business at Dartmouth College and The Dartmouth Institute.

Dr. Chertoff is particularly interested in workforce issues in Radiology, in Gastrointestinal Imaging, in resident education, in issues for women physicians, and in faculty development. She serves on multiple institutional and national committees, and is Past Chair of the AAMC Group on Women in Medicine and Science, Past President of the Association of Clinician Educators in Radiology (ACER), of the Association of Program Directors in Radiology (APDR) of the Association of University Radiologists (AUR) and the New Hampshire Radiological Society.

BIOSKETCH – Lori Deitte, MD, FACR, FAUR

Dr. Deitte is Professor and Vice Chair of Education of the Department of Radiology, as well as the Vice President for Continuous Professional Development, at Vanderbilt University Medical Center (VUMC) in Nashville, Tennessee. Lori is a devoted educator, mentor and sponsor who enjoys inspiring others to believe in themselves and be empowered to pursue successful careers.

BIOSKETCH – Kristen K. DeStigter, MD, FACR

Dr. DeStigter is the John P. and Kathryn H. Tampas Green and Gold Professor and Chair of Radiology at the Larner College of Medicine at the University of Vermont and the Radiology Health Care Service Chief for the University of Vermont Health Network. She received her MD from Case Western Reserve University School of Medicine, and completed her diagnostic radiology residency and fellowship in Body Imaging/Women's Imaging at University Hospitals Cleveland. She has expertise in world health, specializing in lower-middle income economies (LMICs).

With a career focused on education, Dr. DeStigter was program director of the diagnostic radiology residency program at the University of Vermont for 12 years and served as President of the Association of Program Directors in Radiology (APDR). During her tenure, Dr. DeStigter received three University of Vermont teaching awards. For 7 years she sat on the Accreditation Council for Graduate Medical Education (ACGME) Residency Review Committee for Radiology. Formerly, she was President of the Vermont Radiological Society for 5 years, initiating the first resident and fellow section and winning three awards from the American College of Radiology for legislative progress at the State level. She was an invited member of the New England Roentgen Ray Society Executive Committee, focusing on resident education. She is a recipient of the Radiological Society of North America (RSNA) 2016 Outstanding Educator Award, given to one individual each year. She is the 2020 recipient of the APDR Lifetime Achievement Award. She is a frequent invited speaker at both national and international conferences, lecturing on topics germane to global health.

Dr. DeStigter's research interests and accomplishments include unique applications of ultrasound in rural medicine, the application of AI/ML to democratize rural imaging, the provision of integrated medical imaging services in under-served communities, medical education in diagnostic radiology, and global advances in women's health care. She is a champion of many projects for safety and quality of care in clinical radiology. In the international community, Dr. DeStigter leveraged her knowledge and experience through her participation as a member of the World Health Organization Referral Guidelines Development Group as part of the International Radiology Quality Network. Dr. DeStigter is past Chair of the RSNA Committee on International Radiology Education (CIRE) and was a member of the RSNA Education Committee. She also serves on the American College of Radiology (ACR) Foundation's International Outreach Committee. She chairs the AUR International Relations Committee. She is an invited member of the Executive Committee of the Lancet Commission on Diagnostics, focusing on access to essential diagnostics in LMICs and resource-constrained areas in high-income countries, with a Report published in the Lancet in 2021. Her publications focus on global health, and she is an invited reviewer for several journals. In her role as Chair of Radiology she exposes medical students and residents to service learning, and advances global health research.

Drawing upon her experience in international radiology, education, and leadership, Dr. DeStigter co-founded a nonprofit organization, Imaging the World, in 2008 that specializes in integrating low-cost ultrasound programs into remote health clinics where radiologists, technologists and the usual infrastructure required of imaging systems are lacking (www.imagingtheworld.org). Through her work over the last fourteen years, clinical facilities in rural Uganda and Malawi have access to reliable ultrasound imaging, close to home for many patients. The program is supported by grant awards, including from the Bill & Melinda Gates Foundation. In 2016, Dr. DeStigter received the American College of Radiology Foundation Global Humanitarian Award for her work improving medical imaging and access to care. In addition, she received a Certificate of Recognition from the Uganda Society for Advancement of Radiology and Imaging (USOFARI) for providing invaluable resources towards improving breast cancer diagnosis and management in Uganda. More recently, she received the 2018 University of Vermont Citizen of the World Award from the Larner College of Medicine. She was the 2020 Keynote Speaker for the Opening Ceremony of the RSNA, speaking on, "The Power of Radiology to Drive Collective Action and Transform Global Health."

BIOSKETCH – Marta Heilbrun, MD, MSCI

Dr. Heilbrun is the Vice Chair for Quality in the Emory Department of Radiology and Imaging Sciences. She completed medical school at the University of Utah, did a Preliminary Surgery Internship at Stanford, a Diagnostic Radiology Residency at Wake Forest/North Carolina Baptist Hospital and fellowship training in abdominal imaging and outcomes back at the University of Utah. Her initial career was built at the University of Utah, where she developed as an abdominal imager with expertise in GU diseases and as an outcomes/health services researcher and educator, eventually becoming the Diagnostic Radiology Program Director.

She has been in the Emory Department of Radiology and Imaging Sciences since 2017 as the Vice Chair for Quality. Dr. Heilbrun leads Quality and Safety initiatives throughout the entire Emory Healthcare Organization. Activities of her team include Lean Management, Safety Culture, Standard Work Development, Policy Management, Accreditation Readiness, and more. Her team at leads the Emory Radiology departments' implementation of Emory Healthcare's quality improvement platform and Lean Transformation Journey - Emory EmPower.

She is a nationally recognized leader in Quality Improvement and Informatics. She has studied medical decision making, evidence-based guidelines, and the potential insights available through medical and healthcare data mining. She believes that the most appropriate, personalized, and patient centered care is provided when the insights from front-line workers and metrics are used to break down barriers. Systems will improve how we care for our patients and communities when we embrace standard work as a foundation of change culture. She is a leader in the national conversation about radiology reporting, including content, interoperability standards, AI integrations and the value proposition for the care radiologists provide enabled by the systems in which radiologists work.

Dr. Heilbrun first became involved with the AUR during residency, as the recipient of the inaugural Radiology Alliance for Health Services Research (RAHSR) – Harvey L. Neiman Award in 2005. She subsequently received the General Electric-Association of University Radiologists Radiology Research Academic Fellowship (GERRAF) award from 2007-2009. She has served the AUR in multiple leadership roles and has been on the Board of Directors since 2012.

BIOSKETCH – Christopher P. Hess, MD, PhD

Dr. Hess is Professor and Chair of the Department of Radiology & Biomedical Imaging at the University of California, San Francisco (UCSF). He completed his residency and fellowship in Neuroradiology at UCSF after obtaining undergraduate, master's and doctorate degrees in electrical engineering at the University of Illinois working in signal and imaging analysis and magnetic resonance imaging. His clinical interests revolve around imaging evaluation of dementia, epilepsy and neurovascular disease, and his research interests are in MRI and in computational neuroimaging.

Dr. Hess is a Fellow of the American Institute for Medical and Biological Engineering, the International Academy of Medical and Biological Engineering and the American Society of Functional Neuroradiology. He has published broadly in clinical and scientific journals, is a regular member of NIH study sections, and has lectured nationally and internationally in neuroradiology and imaging science. He holds leadership responsibilities in the *Radiological Society of North America*, the *American Society of Neuroradiology*, the *AAMC Council of Faculty and Academic Societies*, and the *International Society for Magnetic Resonance in Medicine*

BIOSKETCH – Alexander Norbash, MD

Dr. Norbash is Chair and Professor of Radiology at the University of California, San Diego, (UCSD) in the School of Medicine, appointed in 2015. He practiced as an interventional and diagnostic neuroradiologist from 1994 through 2015 and currently is actively practicing as a diagnostic neuroradiologist. His translational research interests include engineering collaborations creating novel tools and materials for endovascular neurologic therapies, and interventional robotics. Management topics of greatest familiarity include leadership, strategic planning, teamwork, and healthcare reform. He is the founding faculty director for Blue LINC in 2015, now HealthLink <https://healthlink72.wixsite.com/uc-san-diego-health/home> a team-based biodesign certificate course that includes students from the schools of engineering, business, and medicine. Prior responsibilities include his service as UCSD Associate Vice-Chancellor for Diversity, Equity and Inclusion with principal responsibilities for Climate and Professional Development across the university campus from 2017-2020.

After receiving his medical degree from the University of Missouri-Kansas City 6 year BA/MD program, and completing his radiology residency at St. Francis Medical Center and the University of Pittsburgh, he completed fellowships in Diagnostic and then Interventional Neuroradiology at Stanford University, joining the Stanford faculty from 1994-1998, and subsequently the Massachusetts General Hospital from 1998-2000. He served as Director of Diagnostic and Interventional Neuroradiology at the Brigham and Women's Hospital from 2000-2004, and founded the Endovascular Neurosurgical and Interventional Neuroradiology practices at the Brigham and Women's Hospital. He received a Master's Degree in Health Care Management from the Harvard School of Public Health in 2004. He served as Chair and Professor of Radiology at Boston University School of Medicine from 2004-2015, where he also served as Assistant Dean for Diversity and Multicultural Affairs from 2011-2015.

He is immediate past-President of the American Roentgen Ray Society, and immediate past Vice-President of the American College of Radiology. He is past-President of the Society of Chairs of Academic Radiology Departments, and previously served as President of the Massachusetts Radiological Society, and President of the New England Roentgen Ray Society. He was the founding Chair of the American College of Radiology (ACR) Head Injury Institute, is a past Chair of the ACR Board of Chancellors Neuroradiology Commission, and is a Fellow of the ACR. He is a founding board member of the ACR Radiology Leadership Institute (RLI), and has chaired the national annual summer RLI summit for the past seven years. He has developed a number of endovascular tools and products which are in clinical usage, has cofounded 5 start-up companies including an Imaging Core Laboratory, and has given over 500 lectures and invited presentations on six continents.

BIOSKETCH – Reed A. Omary, MD, MS, FAUR

Dr. Omary is the Carol D. and Henry P. Professor and Chair of the Department of Radiology at Vanderbilt University Medical Center (VUMC) in Nashville, Tennessee. He has more than 20 years of experience as a practicing interventional radiologist, scientist and educator. Reed is an avid mentor who enjoys inspiring individuals and organizations alike to innovate.

BIOSKETCH – Pablo R. Ros, MD, MPH, PhD, FAUR

Dr. Ros received his MD and PhD, from the Autonomous University of Barcelona, Spain in his native city. He completed his Residency and Fellowship at Mount Sinai Medical Center/University of Miami, in Florida. He obtained a Master of Public Health (Health Care Policy and Management) at the Harvard School of Public Health in 1998.

After completing his training Dr. Ros became Chief of Gastrointestinal Radiologic Pathology at the Armed Forces Institute of Pathology (AFIP); later, continued his association with the AFIP as a Visiting Scientist. He became in 1987 The Founding Director of the Division of Abdominal Imaging at the University of Florida (UF) and Director of Magnetic Resonance Imaging. At UF Dr. Ros was promoted to Professor of Radiology and appointed Associate Chairman.

In 1998, Dr. Ros was appointed Professor of Radiology at Harvard Medical School and Executive Vice Chair at the Brigham and Women's Hospital. In Boston, he also served as Director and Chief Operating Officer of Partners Radiology (Partners Healthcare integrates the Brigham and Women's Hospital and the Massachusetts General Hospital) and Chief of Radiology at the Dana Farber Cancer Institute.

Dr. Ros became the Theodore J. Castele University Professor and Chairman of the Department of Radiology at Case Western Reserve University and Radiologist-in-Chief of the University Hospitals Health System in 2009. In addition, he served as President of the Clinical Chairs Council and the Board for University Hospitals Cleveland Medical Center. Dr. Ros was appointed Founding Director of the UH Diagnostics Institute in 2017, which encompasses the Departments of Genetics, Pathology and Radiology. Currently serves at CWRU as Professor of Radiology and Pathology.

Dr. Ros has served or serves as President, Committee Chair or in the Board of Directors of several Radiological Societies, such as The Radiological Society of North America (RSNA), Association of University Radiologists (AUR), Interamerican College of Radiology (CIR), Society of Gastrointestinal Radiologists (now SAR), American College of Radiology and New England Roentgen Ray Society. He is a Fellow of the American College of Radiology, the Society of Abdominal Radiology, the Society of Computed Body Tomography and MRI and Honorary Fellow of the European Society of Gastrointestinal and Abdominal Radiology. He has received Honorary Memberships for the National Radiological Societies of Switzerland, Belgium, Argentina, France, Mexico, Germany, Cuba, Ecuador and Japan.

His over 300 publications and 20 textbooks are primarily in Abdominal and Oncologic Imaging focusing on liver, pancreatic, mesenteric and gastrointestinal cross-sectional imaging with pathologic correlation. Other research areas include Magnetic Resonance Imaging, the development of liver specific and oral contrast agents for MRI, CT and PET-CT imaging and Radiology Services Research. He holds eleven editorial positions including former Associate Editor of Radiology and Consultant to the Editor in the same journal.

Dr. Ros founded the AUR's Radiology Management Program in 2002 and has served as Program Chair or Director since then. The program has over 500 alumni with many Department Chairs and Vice Chairs among them.

BIOSKETCH – Judy Yee, MD, FACR

Dr. Yee is Professor and University Chair of Radiology at the Albert Einstein College of Medicine and Montefiore Health System. Prior to this role she was the Vice-Chair of Radiology and Biomedical Imaging at the University of California, San Francisco (UCSF). She was also Chief of Radiology and Director of the 3D Imaging Lab at the San Francisco VA.

Dr. Yee is widely known as an accomplished abdominal radiologist with a research focus on CT Colonography (CTC, also known as Virtual Colonoscopy), as well as bowel, liver and pancreatic imaging. She has performed multiple landmark studies and is considered a pioneer in the field of CTC which is used for colorectal cancer screening and diagnosis. Dr. Yee has published extensively and she has served as the principal investigator of numerous funded research projects. Dr. Yee is the editor and primary author of a textbook entitled “Virtual Colonoscopy” and she holds a patent on Enhanced Virtual Colonoscopy.

Dr. Yee is an experienced leader and provides valuable service to many organizations. She served as the President of SAR (Society of Abdominal Radiology) from 2015-2016. She is Chair of the American College of Radiology Colon Cancer Committee. She is a Founding Member of the Colon Cancer Foundation Advisory Committee. She is a member of the Global Radiology Leaders Board for Health4The World. She is Chair of the Diversity, Equity, and Inclusion Committee for the Society of Chairs of Academic Radiology (SCARD), a Board member and Co-Chair of the DEI Committee for the New York State Radiologic Society and a member of the DEI Committee for RSNA. She is an Associate Editor of JCAT and on the Editorial Board of Abdominal Radiology and Past Editorial Board Member of Radiology, AJR and RadioGraphics. She is a fellow of the American College of Radiology, the Society of Abdominal Radiology and the Society of Advanced Body Imaging. Dr. Yee has also been appointed to the Board of Directors of the Association of University Radiologists in 2021.

Dr. Yee is the recipient of multiple awards including the Excellence in Teaching Award from the Academy of Medical Educators, Visiting Professorship Award from the SAR, Best Speaker Award of the American Roentgen Ray Society, and the UCSF Outstanding Faculty Mentoring Award. She received the 2019 Honorary Fellow Award of the European Society of Gastrointestinal and Abdominal Radiology (ESGAR) in recognition of her global contributions to the field. Dr. Yee is the first woman to receive this honor in the 30 year history of ESGAR. Dr. Yee was also awarded Honorary Fellow of the British Society of Gastrointestinal and Abdominal Radiology (BSGAR) in 2022 in recognition of her contributions to the field of abdominal imaging and diversity, equity and inclusion.

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