2021 AUR

Radiology Management Program

Program Syllabus

AUR Radiology Management Program
(All times are in Eastern)

May 4-6, 2021

Tuesday, May 4

5:00-6:00pm — Management Networking (Include self-introduction of Faculty and Attendees and virtual course mechanics including Zoom rooms for case discussions for small groups).

Wednesday, May 5

11:00am — Tech check and run through with all speakers and Digitell producer

12:00-1:00pm — Welcome and Overview and Case 1
The Hunger Games: Productivity Bases Compensation Plan for Academic Radiologists
Pablo R. Ros, MD, MPH and Kristen K. DeStigter, MD

1:15-2:15pm — Case 2 & Discussion
Practice Quality Improvement: Where Do I Start?!?
Aine M. Kelly, MD, MS and Paul P. Cronin, MBBCh

2:30-3:30pm — Case 3 & Discussion
Friend or Foe? Managing Complex Relationships with Healthcare Partners and Competing Practice Groups
Nicholas M. Beckmann, MD and Manickam Kumaravel, MD

3:45-4:45pm — Case 4 & Discussion
Negotiation: Wholistic Approach and Virtual Interactions
Christopher P. Hess, MD, PhD and Anthony Grise

Thursday, May 6

10:00am — Tech check and run through with all speakers and Digitell producer

11am – 12:00pm — Case 5 & Discussion
Designing the Academic Mission in an Era of Constraints
Reed A. Omary, MD, MS and Lori A. Deitte, MD

12:00 – 1:00pm — Case 6 & Discussion
Academic Radiology Departments Relationships with Industry
Matthew A. Barish, MD and Judy Yee, MD

1:00 – 2:00 pm — Case 7 & Discussion
Building a Culture of Wellness and Resilience
Carolyn C. Meltzer, MD and Cheri L. Canon, MD

2:00 - 2:30 pm	Annual Alumnus Oration ***TIME- The Wisest Counselor of Them All*** *Christoph Wald, MD, PhD*
2:30 - 3:30 pm	Case 8 & Discussion ***Academic Radiology Expansion into Regional Practice*** *Jocelyn D. Chertoff, MD, MS, FAUR and Michael P. Recht, MD*
3:30-4:00pm	Keynote Address ***Leadership & Identity: Forging the Future:*** *Reed A. Omary, MD, MS*
4:00- 5:00pm	Closing remarks *Jocelyn D. Chertoff, MD, MS, FAUR*

Table Assignments

Case Study Discussion

Case Study #1
"The Hunger Games: Productivity Bases Compensation Plan for Academic Radiologists "

Table #1
- Matthew Bucknor, MD
- Judah Burns, MD
- Erin A. Cooke, MD
- Mark A. Sultenfuss, MD

Table #2
- Sachin Dheer, MD
- Alessandro Furlan, MD
- Theodore R. Hall, MD
- Joy A. Haven, PhD, MBA
- Stephen Hobbs, MD, FSCCT
- Shaun A. Wahab, MD

Table #3
- J. J. Paul Jacobson, MD, MPH
- Paul Nikolaidis, MD
- Gregory Lehmann, MHA
- Jamlik-Omari F. Johnson, MD
- David S. Pryluck, MD, MBA
- Jonelle Thomas, MD, MPH

Table #4
- Abouelmagd Makramalla, MD
- Vincent M. Mellnick, MD
- James T. Lee, MD
- Maryam Rezvani, MD
- Andrew Rosenkrantz, MD
- Matthew E. Zygmont, MD

Table #5
- Andrew J. Gunn, MD
- Mari Hagiwara, MD
- Elaine S. Gould, MD
- Susan Hobbs, MD, PhD
- Jonathan O. Swanson, MD

Case Study #2
"Practice Quality Improvement: Where Do I Start?!?"

Table #1
- Mari Hagiwara, MD
- Elaine S. Gould, MD
- J. Paul Jacobson, MD, MPH
- Andrew Rosenkrantz, MD
- Susan Hobbs, MD, PhD

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Table #4
- Stephen Hobs
- Alessandro Furlan, MD
- Andrew J. Gunn, MD
- Jonelle Thomas, MD, MPH
- Matthew E. Zygmont, MD

Table #5
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- Jamlik-Omari F. Johnson, MD
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- Paul Nikolaidis, MD
- Shaun A. Wahab, MD
- Maryam Rezvani, MD

Case Study #3
"Friend or Foe? Managing Complex Relationships with Healthcare Partners and Competing Practice Groups"

Table #1
- **Vincent M. Mellnick, MD**
- **Andrew J. Gunn, MD**
- **Abouelmagd Makramalla, MD**
- **J. Paul Jacobson, MD, MPH**
- **Shaun A. Wahab, MD**
- **Gregory Lehmann, MHA**

Table #2
- **Susan Hobbs, MD, PhD**
- **Mari Hagiwara, MD**
- **Jonathan O. Swanson, MD**
- **Matthew E. Zygmont, MD**
- **Paul Nikolaidis, MD**

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- **Theodore R. Hall, MD**
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- **Jonelle Thomas, MD, MPH**
- **Maryam Rezvani, MD**
- **Joy A. Haven, PhD, MBA**
- **Matthew Bucknor, MD**

Case Study #4
"Negotiation: Wholistic Approach and Virtual Interactions"

Table #1
A • **Shaun A. Wahab, MD**
A • **Matthew E. Zygmont, MD**
B • **Erin A. Cooke, MD**
B • **David S. Pryluck, MD, MBA**
B • **Elaine S. Gould, MD**

Table #2
A • **Matthew Bucknor, MD**
A • **Sachin Dheer, MD**
A • **Susan Hobbs, MD, PhD**
B • **Jonelle Thomas, MD, MPH**
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B • **Abouelmagd Makramalla, MD**

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B • **Vincent M. Mellnick, MD**

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B • **Paul Nikolaidis, MD**

Table #5
A • **Maryam Rezvani, MD**
A • **J. Paul Jacobson, MD, MPH**
B • **Judah Burns, MD**
B • **Alessandro Furlan, MD**
B • **Theodore R. Hall, MD**

For Case 4, each table will further breakout into negotiators A and B groups separately for 15 minutes, and then meet together as a table for an additional 20 minutes. We will regroup and discuss outcomes in the main room for the final 15 minutes.

Case Study #5
"Designing the Academic Mission in an Era of Constraints"

Table #1
- **Shaun A. Wahab, MD**
- **Matthew Bucknor, MD**
- **Joy A. Haven, PhD, MBA**
- **Mari Hagiwara, MD**
- **Maryam Rezvani, MD**

Table #2
- **Matthew E. Zygmont, MD**
- **Sachin Dheer, MD**
- **Jonathan O. Swanson, MD**
- **J. Paul Jacobson, MD, MPH**
- **Vincent M. Mellnick, MD**

Table #3
- **Erin A. Cooke, MD**
- **Susan Hobbs, MD, PhD**
- **James T. Lee, MD**
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- **Judah Burns, MD**
- **Abouelmagd Makramalla, MD**

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- **Elaine S. Gould, MD**
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- **Theodore R. Hall, MD**

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- **David S. Pryluck, MD, MBA**
- **Jonelle Thomas, MD, MPH**
- **Andrew J. Gunn, MD**
- **Gregory Lehmann, MHA**
- **Alessandro Furlan, MD**
- **Paul Nikolaidis, MD**

Case Study #6
"Academic Radiology Departments Relationships with Industry"

Table #1
- Andrew Rosenkrantz, MD
- Erin A. Cooke, MD
- Joy A. Haven, PhD, MBA
- Matthew E. Zygmont, MD
- Shaun A. Wahab, MD
- Jamlik-Omari F. Johnson, MD

Table #2
- J. Paul Jacobson, MD, MPH
- Jonathan O. Swanson, MD
- David S. Pryluck, MD, MBA
- Jonelle Thomas, MD, MPH
- Paul Nikolaidis, MD
- Abouelmagd Makramalla, MD

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- Elaine S. Gould, MD
- Gregory Lehmann, MHA
- Judah Burns, MD
- Andrew J. Gunn, MD
- James T. Lee, MD
- Maryam Rezvani, MD

Table #4
- Vincent M. Mellnick, MD
- Susan Hobbs, MD, PhD
- Sachin Dheer, MD
- Mark A. Sultenfuss, MD
- Theodore R. Hall, MD

Table #5
- Matthew Bucknor, MD
- Mari Hagiwara, MD
- Alessandro Furlan, MD
- Stephen Hobbs, MD, FSCCT

For Case 6, tables will breakout for each scenario to discuss. The main group discussion assignments are below:

Scenario 1:
    12:00-12:05 Introduction (3-5 Minutes)
    12:05-12:10 Breakout Room Discussion (5 minutes)
    12:10-12:15 Breakout Rooms 1&2 Report (5 minutes)
Scenario 2:
    12:15-12:20 Breakout Room Discussion (5 Minutes)
    12:20-12:25 Breakout Rooms 3&4 Report (5 Minutes)
Scenario 3a & 3b
    12:25-12:30 Breakout Room Discussion (5 Minutes)
    12:30-12:35 Breakout Room Group 5 Reports (5 Minutes)
Scenarios 4 & 5
    12:35-12:45 Scenario 4 Main Room Discussion (10 Minutes)
    12:45-12:55 Scenario 5 Main Room Discussion (10 Minutes)
Final Remarks
    12:55-1:00 PM Final Remarks

Case Study #7
"Building a Culture of Wellness and Resilience"

Table #1
- Mari Hagiwara, MD
- Abouelmagd Makramalla, MD
- Theodore R. Hall, MD
- Alessandro Furlan, MD
- Jamlik-Omari F. Johnson, MD

Table #3
- J. Paul Jacobson, MD, MPH
- Andrew Rosenkrantz, MD
- Maryam Rezvani, MD
- David S. Pryluck, MD, MBA
- Andrew J. Gunn, MD
- Judah Burns, MD

Table #5
- Joy A. Haven, PhD, MBA
- Susan Hobbs, MD, PhD
- Jamlik-Omari F. Johnson, MD
- Vincent M. Mellnick, MD
- Matthew Bucknor, MD
- Jonelle Thomas, MD, MPH

Table #2
- Matthew E. Zygmont, MD
- Jonathan O. Swanson, MD
- Stephen Hobbs, MD, FSCCT
- Sachin Dheer, MD
- Shaun A. Wahab, MD

Table #4
- Erin A. Cooke, MD
- Gregory Lehmann, MHA
- James T. Lee, MD
- Mark A. Sultenfuss, MD
- Paul Nikolaidis, MD
- Elaine S. Gould, MD

Case Study #8

"Academic Radiology Expansion into Regional Practice"

Table #1
- Matthew Bucknor, MD
- Paul Nikolaidis, MD
- Andrew J. Gunn, MD
- Sachin Dheer, MD
- Jamlik-Omari F. Johnson, MD
- James T. Lee, MD

Table #2
- Vincent M. Mellnick, MD
- Mark A. Sultenfuss, MD
- David S. Pryluck, MD, MBA
- Stephen Hobbs, MD, FSCCT
- Alessandro Furlan, MD
- Maryam Rezvani, MD

Table #3
- Mari Hagiwara, MD
- Charles Burke, MD
- J. Paul Jacobson, MD, MPH
- Erin A. Cooke, MD
- Joy A. Haven, PhD, MBA
- Jonathan O. Swanson, MD

Table #4
- Abouelmagd Makramalla, MD
- Matthew E. Zygmont, MD
- Andrew Rosenkrantz, MD
- Gregory Lehmann, MHA
- Theodore R. Hall, MD

Table #5
- Judah Burns, MD
- Elaine S. Gould, MD
- Jonelle Thomas, MD, MPH
- Susan Hobbs, MD, PhD
- Shaun A. Wahab, MD

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 sub-specialty. 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).

Dt. 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 ≥ 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

"Practice Quality Improvement: Where Do I Start?!?"

Aine M. Kelly, MD, MS
Paul P. Cronin, MBBCh

Practice Quality Improvement: Where Do We Start?!?

Aine Marie Kelly MD, MS, MA and Paul Cronin MD, MS

Dr. Ina Bind, the interim chair of the Lakelands radiology department is worried about the upcoming external review of the radiology department. She fears that this will impact her chances of becoming the next chair of this top 10 academic center.

Body cross sectional imaging (CT and MRI) is understaffed (several FTE`s left this year) and unable to recruit new faculty despite interviewing several people. As a result, they are persistently behind on reporting studies, with massive backlogs of CT`s, and frequently > 200 unread CT cases on the worklist by Friday. At weekends, a couple of faculty moonlight for money, which reduces the list, but by Wednesday, the worklist is huge again! When the moonlighters are off, things get out of control with several hundreds of unread CT cases. On call residents and faculty body CT radiologists are now getting calls out of hours to come in and interpret CT cases, for patients having surgery or clinics the next day. Other divisions like neuroradiology are also understaffed, but they don't have the same issues

There are 14 faculty in body imaging, 10 are fulltime. Six faculty read body imaging each day, with specific assignments (1-Emergency Department, Inpatients, and urgent "STAT" cases, this radiologist is the "Officer of the day" (OD), 2-CT Angiography (including cardiac CT), 3-MRI, 4-Procedures/outside studies for multidisciplinary conferences, 5-offsite satellite clinic and 6-general). The general person is often a senior faculty member as they are not comfortable doing OD (dealing with patient clinical issues, contrast extravasations and reactions and any questions that arise from technologists/, nurses, clinicians or others) or interpreting complex cases (e.g. Transcatheter Aortic Valve Replacement [TAVR] CT, mesenteric CT, or cardiac MRI). The senior faculty (a.k.a. the "grumpy old men"!) are not comfortable performing CT procedures. The offsite satellite clinic faculty read is physically located there to cover contrast and clinical issues, as there are no other medical specialists such as internal medicine or anesthetics or critical care units there. Satellite radiologists have to evaluate and stabilize sick patients before transfer to the Lakeland hospital ED for further care. Consequently, the "grumpy old men" refuse to go to the satellites, even calling in sick if scheduled there.

The biopsy faculty is also out of the room quite a bit, consenting patients, talking with families, and putting electronic orders into the system for analgesia or follow up radiographs. There are between one and four cardiac CT cases daily for the CT angio faculty, so they are busy entering orders for beta blockers and other drugs, or they are out of the room, reviewing patients with chest pain, or trying to prepare the patient for imaging or overseeing imaging set up and performance. In addition, the cardiologists interpret the cardiac part of the cardiac CTs, with the radiologist interpreting the remainder of the structures in the chest. When the cardiologists and their fellows eventually swing by, the radiologist has to sit with them and review the rest of the structures in the chest and teach them.

The faculty assigned to cover body MRI is often called to the MRI scanner, monitoring scanning of MRI cases, which includes evening MRIs. The body MR technologists insist on radiologist monitoring to ensure adequate coverage etc., as some faculty had complained vehemently about the quality of the MRI studies, getting some technologists into trouble. This led to setting up a separate evening body MRI schedule for fellows or faculty to oversee the body MRI cases, with one fellow or faculty coming in late (11am) to compensate for staying later (~8pm). That means that a fellow or faculty is out of the room (in

the MR scanner) for large tracts of the day. From 8am to 11am the MRI technologists call the body reading room frequently to ask another faculty to come over and monitor the MRI cases.

There are huge volumes of CT protocols to work through each day, most of which are done by the OD or occasionally another faculty (if the OD is out of the room). The reading room coordinator checks the patient electronic record for allergy and creatinine/GFR and then assigns protocols to all the faculty to sign. Many senior faculty are unapproachable, and the coordinators are afraid to burden them, so junior faculty get a larger share of the CT protocols.

There is a system of assigning urgency to CT cases, with a red bell symbol indicating urgent cases. Urgency is determined by the referring clinician, allied personnel (or sometimes clerks) who request the CT. On the work list, the reporting radiologists see a sea of red bells (urgent or STAT reads) with a few non-urgent cases. Most if not all of the "STAT" cases are left to the OD to interpret as these cases "belong" to the OD, according to the division director, Dr. Doovery Little and other faculty.

There were so many add on / urgent or emergent CT requests, causing delays approving them, the decision was made to accept and scheduling these CTs automatically. Now, all add on / urgent or emergent CT requests from floors or clinics are scheduled without radiologist input, with the CT study protocoled after scheduling. Sometimes the indication is inappropriate, a contraindication is found or essential information (e.g. allergies or creatinine level) is missing. This causes delays, trying to reach clinicians, correcting study request forms and optimizing protocols, sometimes necessitating the re-assignment of patients into different time slots, and delaying routine scheduled outpatients, leading to much frustration. As a result, most of these "same-day add on cases" are now scanned later in the day (after 4pm), when the routine CT patients are nearly done. Because of this, it falls to the OD to report and stay late for or the already busy on-call radiology residents pick up these add on CT cases.

Back in the CT reporting room, faculty try to keep things under control (putting out fires). The inpatient/ED CT faculty (DOD) is responsible for quality control issues; contrast issues (extravasations or reactions); patient medical issues; and any questions that arise from clerks, technologists, nurses, referring clinicians or patients. They had assigned residents as OD, but they complained to the program director (PD) about missing noon conference, and the PD created a fuss, so residents don't do OD. Senior faculty won't cover OD, as they find it too stressful and complain bitterly to the body division director. The junior faculty assigned as OD is busy with "non-interpretative" issues and queries, which causes them to be out of the reading room for a lot of the time, and not attacking the growing list of red bell (urgent or STAT) studies.

All the time, the CT list keeps growing with more calls from clinicians with patients are in clinic and no CT results available. One vocal clinician, Dr. Reedit Stadt had complained to the office of clinical affairs, and risk management is involved. Now, Dr. Stadt calls the body CT reading room daily with his list of clinic patients, is directed to the OD, and berates the OD radiologist until they report them STAT!

We recommend that you use a device so that you can take notes to share with the breakout group. Assign a note taker and a person to present the groups findings (when the breakout group rejoins the larger group).

1. Pick one problem (or interrelated problems) to focus on initially (if you have time, pick more than one). Why did you choose this problem? What graphical tool would you use to decide and why?

Classify the problem into one of the five categories of PQI projects described by the ABR for MOC:
- Patient safety
- Accuracy of interpretation
- Report timeliness
- Practice guidelines and technical standards
- Referring physician surveys

Think about how the current problems in Body CT Imaging fit into these categories.

Pick a graphical tool or tools from the following commonly available:
- Flow charts / run chart
- Cause and effect diagram / fishbone diagram / ishikawa – for root cause analysis
- Control chart / Shewhart chart
- Check sheets / tally sheets
- Pareto charts
- Histograms
- Scatter diagrams

2. How do you define and assess the problem/s? How will you get this information?

When doing your assessment, it helps to think in terms of the P`s (Purpose, Patients, Professionals, Processes, Patterns) or (People, Plant [materials], Processes).

Information gathering tools that can be used to define problems include:
- Customer surveys
- Safety and environment of care walkabouts
- Process mapping (e.g. value stream maps) or flow charts
- Peer review and error reporting
- Chart reviews (e.g. monitoring compliance to comply with national patient safety goals)
- Brainstorming sessions
- SWOT (strengths, weaknesses, opportunities, threats) analysis

3. **What approach(es) would you would use and why?**

Overall approach(es) that are commonly used in industry and healthcare include:
- Root cause analysis (RCA) / 5 why's
- Failure mode and effect analysis (FMEA)
- PDSA cycles / ABR approach / Model for healthcare improvement
- Lean Improvement (including value stream mapping)
- Kaizen / Microsystem analysis

- Six sigma

4. Outline your quality improvement plan (suggest using an A3)
The components/steps of quality improvement plan include:
- Define the problem - chose information gathering tools to define
- Assemble the team – remember stakeholders (buy in) and champions (ownership)
- Determine the goals
- Assign ownership for components of plan
- Prioritize solutions - assumptions, constraints, risks, scope, costs, benefits
- Develop timelines
- Monitor and measure outcomes / metrics
- Communications (and display visual tools) to update on progress
- Issues to anticipate/contingencies and countermeasures

5. Now that the QI initiative is up and running, how will you assess the impact of the improvement plan? What barriers do you anticipate and how can you overcome them? What will you so to ensure that the quality improvement efforts are sustained?

If plan is not working, questions to ask include:
- Was the selected solution the correct one?
- Was the plan properly executed?
- Was the initial problem attributed to the wrong cause?

If solution is working, disseminate it further within the department and institution
- Communicate and educate the changes effectively
- Standardize
- Re-deploy
- Repeat

Additional things to think about (and to help address tasks)

What problems / issues are fixable? Is there any "low hanging fruit"?

Who can/needs to be involved in fixing the issues? Who should be on the QI or Lean team?

What will you have to do to put your quality improvement plan into place?
The necessary elements for a successful QI initiative are:
- Departmental and institutional leadership /support
- Build consensus and momentum to promote a "just culture" of quality and safety
- Put processes in place to manage customer relations
- Identify and work to continually engage all stakeholders
- Assemble a quality management team (or teams)
- Establish surveillance systems to monitor quality indicators
- Select clearly defined problems
- Promote and reward reporting of events, including near misses
- Have a systematic process for analyzing and managing reported events
- Establish ongoing processes to prevent error and improve safety.

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Case Study #3

"Friend or Foe? Managing Complex Relationships with Healthcare Partners and Competing Practice Groups"

Nicholas M. Beckmann, MD
Manickam Kumaravel, MD

Friend or Foe? Managing Complex Relationships with Healthcare Partners and Competing Practice Groups

Case Scenario

Overview

You are the newly appointed chair of a 65 member radiology department at Camden University, a large academic institution in the center of a major metropolitan area. Camden University is contracted with two healthcare systems: a large county healthcare system, Johnson County Healthcare (JCH) and the second largest private healthcare system in the greater metropolitan region, St. Mary's Healthcare System (SMHS). The Camden University radiology department bills for the professional component of every exam read by its radiologists with additional financial support being provided by each of the two contracted healthcare systems. Camden University does not collect any technical component of the exams. In addition, Camden University collectively negotiates bundled reimbursement contracts for all departments with insurance companies. Overall, the contracts are very good for Camden University; however, there is significant heterogeneity in quality of reimbursement across specialties. Some specialties receive well above the national average for reimbursement while other specialties, like radiology, receive well below the national average for reimbursement. The university pursues bundled contracts as it is beneficial for the entire university clinical operations, but significantly disadvantages the radiology department.

County Hospital Contract

Camden University provides radiology coverage for one JCH county hospitals (Appendix A) as well as seven JCH outpatient clinics. The payer mix for JCH is poor, with a large number of patients being uninsured. Camden University only collects five cents for every dollar billed in the JCH system. However, the contract with JCH is good due to JCH providing almost nine million dollars of baseline support every year with an additional monthly bonus payment if the Camden radiology department exceeds a monthly benchmark value by 10% or more. Conversely, the Camden radiology department can incur a penalty if it fails to achieve 90% of the benchmark RVUs for a given month. In general, the Camden radiology department falls within the 90-110% of benchmark range each month (Appendix B), but Camden Radiology does occasionally fall just shy of 90% of benchmark. The director of management operations keeps close track of the RVU production each month and is generally aware when the department is likely to be short of the expected 90% of benchmark.

JCH pays Camden University for 18 radiology FTEs. The FTEs are distributed among the radiology sections at the discretion of the medical director. Some sections, like musculoskeletal, produce well above expectations for their FTE allotment, while other sections produce well below expected RVU production (Appendix C). The JCH hospital covered by Camden University has 1 MRI, 3 CTs, 2 nuclear medicine cameras, 6 ultrasound rooms, 6 radiography/fluoroscopy rooms, 3 mammography rooms, and 2 IR procedure suits. Outpatient imaging is performed in CT, MRI, and ultrasound until 10pm every day. There is a 48-72 turnaround time for outpatient body CT/MR and

screening mammography. All other outpatient imaging services have a less than 24 hour turnaround time. There is a 6 week backlog on non-urgent outpatient interventional radiology procedures, a 4 month backlog on musculoskeletal steroid injections, and a 12 month backlog on spine-related steroid injections. JCH administration has no interest in investing capital to expand imaging services. There is some room from growth in providing musculoskeletal and spine pain injections, but the increased revenue would amount to no more than 1 FTE. JCH administration is unwilling to increase FTE funding unless Camden Radiology consistently demonstrates RVU production above the 100% benchmark value.

Private Hospital Contract

St. Mary's Health System is comprised of 14 hospitals with 24 outpatient imaging centers (Appendix A, D). Camden University provides radiology services for the flagship hospital (a level 1 trauma center) and a small orthopedic specialty hospital, both of which are centrally located in the city. Camden University also provides radiology coverage for 4 SMHS outpatient imaging centers, three of which are centrally located in the city and one in the periphery of the city. Coverage for the remaining 12 hospitals and 20 outpatient imaging centers for St. Mary's Health is provided by two large national radiology corporations, Innovative Imaging and RadCare.

The payer mix for St. Mary's Health is poor due to Camden University primarily covering the busy downtown level 1 trauma center for SMHS with only a few outpatient imaging centers as well as the poor radiology reimbursement under Camden University's contracts with insurance companies. There are major imaging workflow issues within the hospital. The flagship hospital is large and sprawling, which creates transport issues. There is also a high level of patient acuity. This results in a high volume of STAT exams and routine studies take extended periods to perform due to managing patient monitors and support devices. The flagship hospital MRI department also is saturated with outpatients with special needs such as requiring sedation, specialized protocols (e.g. cardiac MR, MR defecography), and special monitoring for implants. These special needs outpatients create a significant strain on the normal MR imaging workflow for the hospital ER and inpatients. Interventional radiology has similar issues with urgent and emergent inpatient exams conflicting with maintaining a reliable outpatient procedure schedule.

The outpatient imaging center has state-of-the-art equipment and protocols and receives referrals from across the city for high-end imaging. As a result, this imaging center is fully booked for 2-3 weeks in advance. However, patients often complain about having to travel into the center of the city and space limitations makes expansion of this center difficult. The other three imaging centers staffed by Camden University have dated equipment and frequently have monthly productivity slightly below management expectations with each generating less than one FTE of professional revenue. SMHS management has been considering closing one of these underperforming imaging centers, however, Camden University leadership have so far convinced SMHS to leave all three imaging centers open.

The revenue generated from professional fees is inadequate for the Camden University radiology department to provide SMHS with the sub specialization and 24-hour radiology coverage SMHS wants at its flagship hospital. Therefore, Camden University negotiates additional financial

support for radiology with SMHS annually. Over the past five years, SMHS has gradually decreased its financial support for the radiology department (Appendix E). SMHS currently provides almost six million dollars of annual support, but SMHS administration has recently informed the Camden University radiology department they plan to cut the financial support by one million dollars for the upcoming fiscal year. The radiology department regularly struggles to meet budget, and this cut will place the radiology departmental budget deep into the red. The SMHS administration has been told that the radiology department cannot function if they cut funding. However, the administration counters that private radiology practices covering other hospitals in the SMHS are able to function without any financial support.

Expansion of Camden University Healthcare

Over the past decade, Camden University has seen tremendous growth in multiple clinical departments, as private practice groups across the city have chosen to join the academic institution in the face of declining reimbursement rates and rising regulatory requirements. In particular, the orthopedic surgery department has seen an increase from a 10 physician group nine years ago to a group of more than 100 surgeons that now provides almost all orthopedic services for the SMHS 14 hospital system. SMHS has negotiated exclusivity contracts with Camden University for all Camden University physicians to only operate at SMHS hospitals. Camden University also provides most inpatient coverage for SMHS. However, except for the JCH clinics, all outpatient clinics staffed by Camden University physicians are owned by Camden University (Appendix F). The electronic medical record for Camden University clinics is constructed to allow electronic order entry that is immediately sent to SMHS scheduling services for patients to have lab work and imaging studies performed at SMHS owned facilities.

Despite the remarkable growth in other departments, the radiology department has seen only minimal growth in the past decade. A major obstacle to growth is exclusivity contracts that prohibit the Camden University radiology department from providing any radiology services at the St. Mary's hospitals and imaging centers currently covered by Innovative Imaging and RadCare. Camden University is very adept in provision of sub-specialty imaging, but has limitations in provision of general radiology coverage, particularly overnight coverage. SMHS values the prestige of its affiliation with Camden University. However, SMHS has been resistant to provide new hospital and imaging center contracts to Camden University because the university radiology department cannot meet similar productivity and turnaround time metrics as Innovative Imaging and RadCare (Appendix G), and the Camden University model also requires baseline support funding for adding any FTEs. In fact, recently SMHS administration has been pressuring Innovative Imaging to improve its productivity and quality metrics, which is significantly below RadCare due to Innovative Imaging staffing several outpatient imaging centers with low patient volumes and RadCare using propriety software to assist with quality metrics.

Mandate for Growth and Financial Independence

Most Camden University physicians prefer Camden University radiologists to read their diagnostic imaging exams. However, SMHS schedulers routinely disregard requests for patients to be

referred to Camden University staffed outpatient imaging centers, instead typically choosing to schedule patients at the imaging facility closest to where the patient lives or works. Furthermore, while billing charges for Camden University professional fees are lower than competing local private groups, the billing charges by SMHS for the technical component of the exam is significantly higher than all competing imaging centers. This results in many Camden University clinic patients choosing to undergo imaging at non-SMHS facilities. Camden University clinicians are often dissatisfied with the imaging quality and interpretation of exams performed at non-Camden University staffed facilities. Camden University radiologists are often asked for "curb-side consults" on outside exams. In addition, when a significant error is identified in the original report, Camden University radiologists are often asked to contact the interpreting radiologist for an addendum if the report was generate within the SMHS system by one of the two private radiology groups who also cover SMHS. The Camden University radiology leadership has previously presented examples of these changes in diagnoses to SMHS administration in an effort to persuade SMHS to facility referral of Camden University clinic patients to Camden University staffed imaging facilities. SMHS administrations responded with a request that Camden University, Innovative Imaging, and RadCare develop an inter-practice peer review system to better determine quality differences between practices as well as promote general quality improvement.

The president of Camden University has prioritized expansion of university clinical practices across the city. He has encouraged departmental chairs to collaborate with other departments or even other practice groups to develop innovative methods for extending university service lines into the periphery of the metropolitan area. As the newly appointed radiology chair, the university president is hoping you will bring big ideas on how radiology, a historically large revenue generator for the university, can reestablish itself as a reliable profit center for the institution.

Small Group Questions

- What is the best course of action to help your department meet its budget?
- Do you think revenue should be the only metric for determining departmental viability? What other metrics would you recommend?
- Would you consider going and negotiating independent contracts for yourself?
- Would you consider partnering with private practice consortiums?
- What can the Camden University radiology department do to expand its clinical practice? Should Camden University radiology department expand?
- Would you implement an inter-practice peer review process?

Appendix A
St. Mary's Healthcare and Johnson County Healthcare Hospital Locations
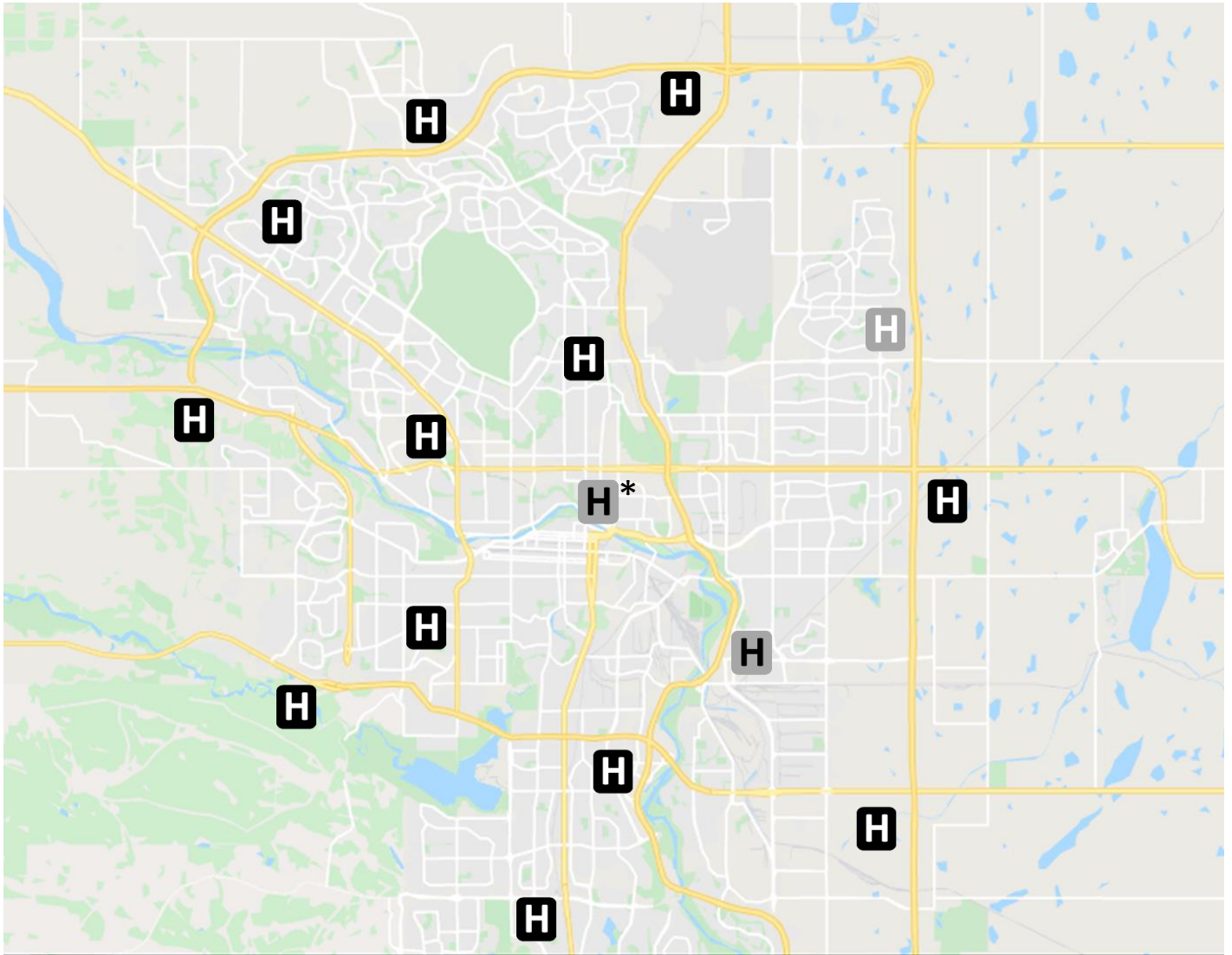
H (gray)	Johnson County Hospital – Camden Radiology Staffed
H (gray)	St. Mary's Healthcare Hospitals – Camden Radiology Staffed
H (black)	St. Mary's Healthcare Hospitals – Non-Camden Radiology Staffed
*	St. Mary's Healthcare Flagship Hospital

Appendix B

## Monthly Camden University Radiology Productivity for Johnson County Health

2018	Expected RVU Production	Actual RVU Production	Percent of Expected RVU Production
January	14,300	12,656	88.5%
February	12,916	11,547	89.4 %
March	14,300	14,901	104.2%
April	13,839	13,327	96.3%
May	14,300	14,329	100.2%
June	13,839	13,742	99.3%
July	14,300	14,486	101.3%
August	14,300	14,843	103.8%
September	13,839	13,341	96.4%
October	14,300	14,929	104.4%
November	13,839	13,659	98.7%
December	14,300	13,628	95.3%
2019			
January	14,300	12,741	89.1%
February	12,916	12,180	94.3%
March	14,300	13,914	97.3%
April	13,839	13,936	100.7%
May	14,300	13,943	97.5%
June	13,839	14,130	102.1%
July	14,300	14,143	98.9%
August	14,300	12,713	88.9%
September	13,839	13,313	96.2%
October	14,300	14,700	102.8%
November	13,839	13,714	99.1%
December	14,300	13,728	96.0%

Appendix C

2019 Camden University Radiology Productivity by Section for Johnson County Health

Section	FTE Allocation	Expected RVU Production	Actual RVU Production	Percent of Expected RVU Production
Breast	2	19,765	19,231	97.3%
Nuclear Medicine	1	6352	5,215	82.1%
Interventional	2	14,244	14,130	99.2%
MSK	1	8164	12,466	152.7%
Neuro	1	12,196	12,855	105.4%
Pediatric	1	5830	3,050	52.3%
Emergency Radiology	3	30,816	35,508	115.2%
Chest	1	8179	7,901	96.6%
Body	6	62,826	52,799	84.0%
Total	18	168,372	163,155	96.9%

Appendix D
St. Mary's Healthcare Outpatient Imaging Center Locations
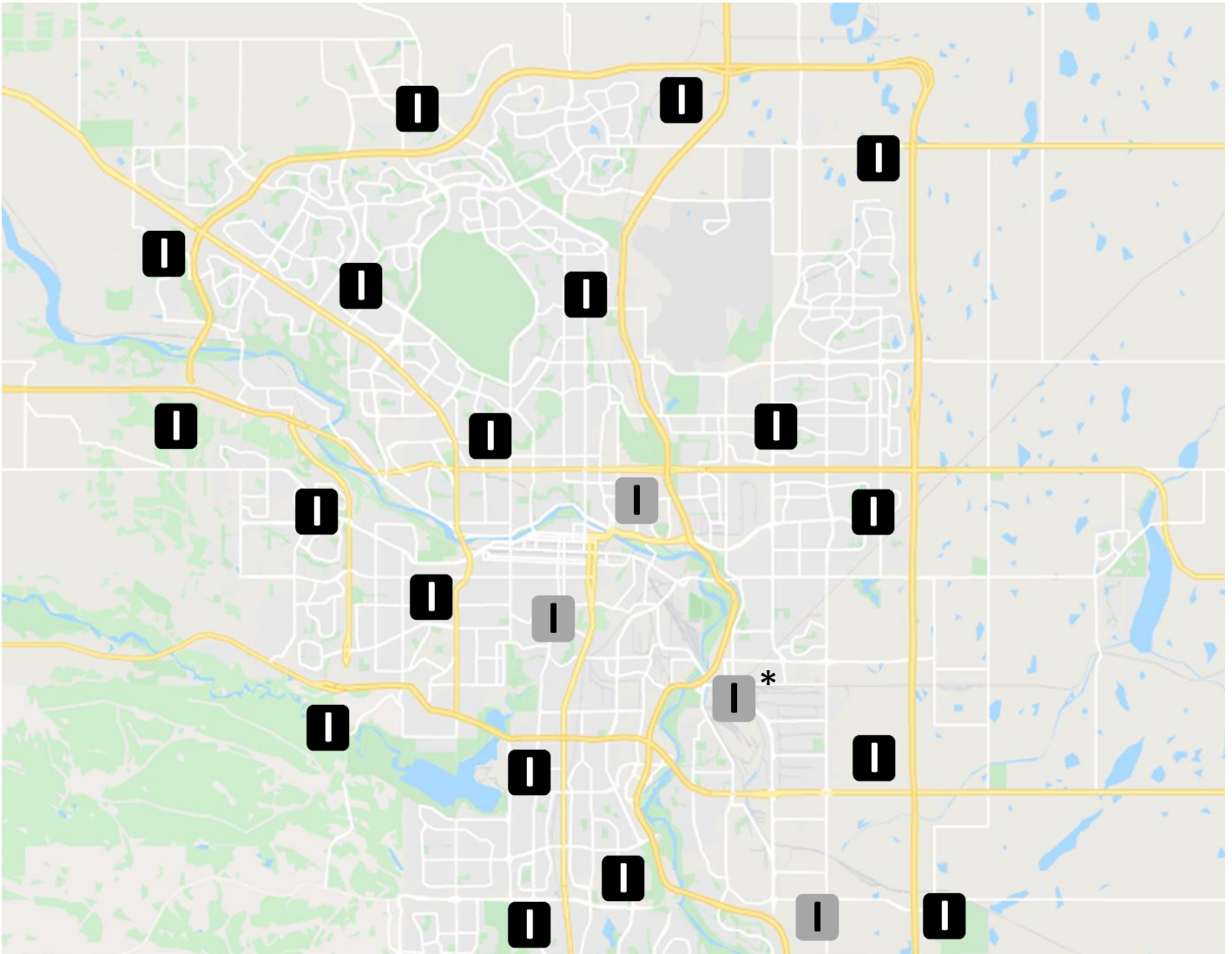
I (gray)   St. Mary's Outpatient Imaging Center – Camden Radiology Staffed

I (black)   St. Mary's Outpatient Imaging Center – Non-Camden Radiology Staffed
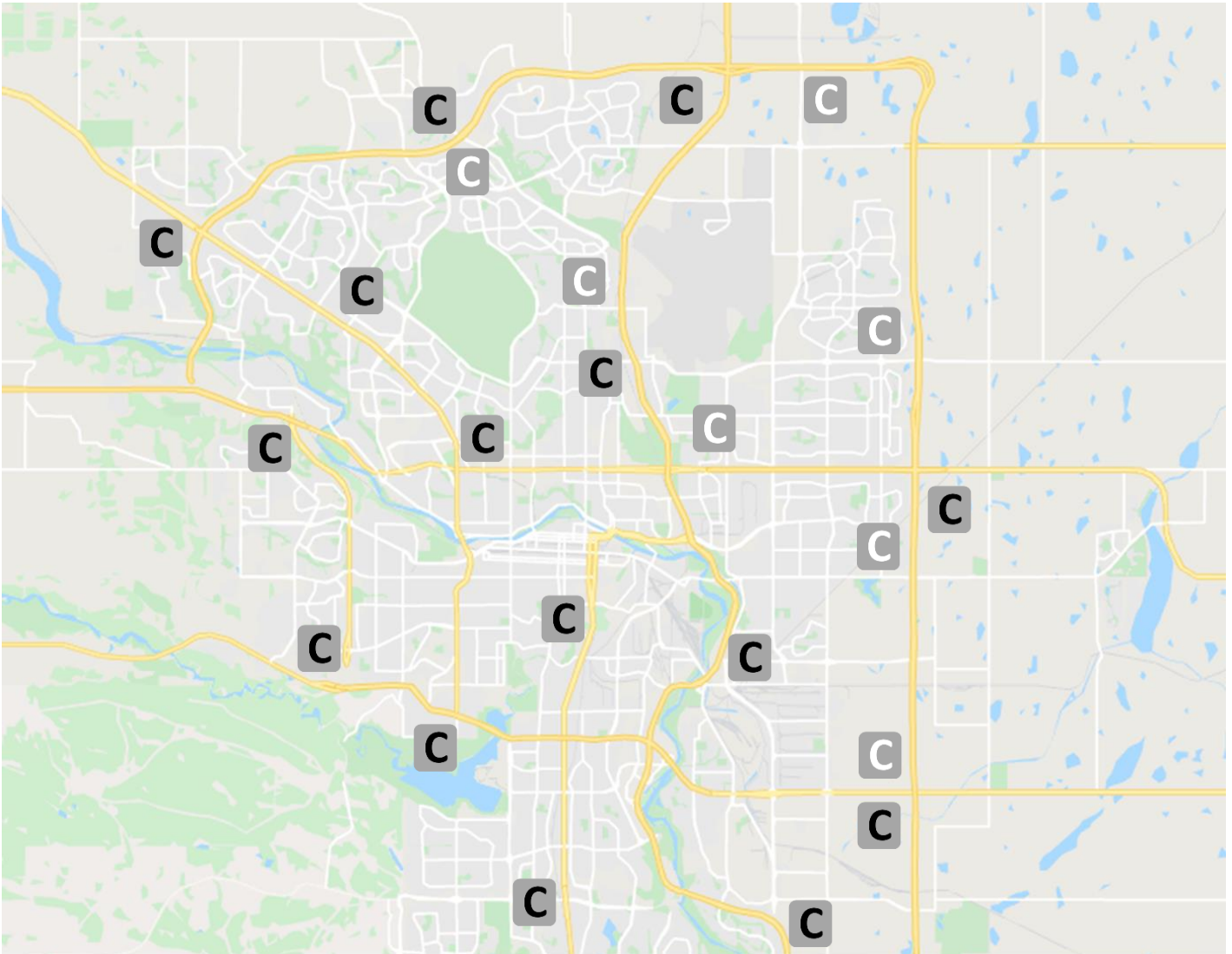
∗   St. Mary's Flagship Outpatient Imaging Center

Appendix E

St. Mary's Healthcare System's Annual Subsidy to Camden University Radiology

Year	Subsidy
2016	$7,000,000
2017	$6,700,000
2018	$6,450,000
2019	$6,200,000
2020	$5,950,000
2021 (projected)	$4,950,000

Appendix F
Camden University Outpatient Clinic Locations

C Camden Outpatient Medicine/Surgical Clinics

C Johnson County Healthcare Clinics – Camden Faculty Staffed

Appendix G

Comparison Metrics of Radiology Groups Covering St. Mary's Healthcare System

	Camden University	Innovative Imaging	RadCare
Mean Report Turnaround Time	8 hours	3 hours	2.75 hours
Mean STAT Report Turnaround Time	4 hours	25 min	18 min
Peer Review Compliance	88%	96%	100%
Patient Satisfaction	92%	98%	98%
Reporting Radiation Dose	95%	97%	100%
Documented Verbal Reporting of Critical Results	98%	98%	100%

Case Study #4

"Negotiation: Wholistic Approach and Virtual Interactions"

Christopher P. Hess, MD, PhD
Anthony Grise

2021 Radiology Management Program

CASE 4 & DISCUSSION

Negotiation: Wholistic Approach and Virtual Interactions

Christopher P. Hess, MD, PhD
Anthony S. Grise, CFCHE

MOUNTAIN HOSPITAL CLINICS AND RADIOLOGY SOLUTIONS GROUP – STRONGER TOGETHER?

Mountain Hospitals and Clinics ("MHC") is a (fictitious) academic healthcare system that serves the three-corner region at the intersection of the states of California, Oregon, and Nevada. MHC is part of the larger (also fictitious) "CONE" network that collectively serves around 250,000 patients. With 45% market share, CONE is the dominant system in the three-state area. It competes with one other (fictitious) large private health system, Three-State Healthcare ("TSH"), which serves around 200,000 patients in the region. CONE, and by proxy MHC, enjoy a favorable payor mix, with approximately 50% private payer contracts for physician and hospital services. There are multiple physician-owned practices in the tri-state area that serve patients from both large health systems, including a private radiology group that owns an outpatient imaging center that is geographically proximate to the MHC.

MHC is known for the full spectrum of medical practice that it provides to its patients, including high-TQ services in oncology, the neurosciences, orthopedics, and cardiology. Considered the primary subspecialty referral center for the region, MHC 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 programs at MHC, there is a busy and growing need for imaging resources. MHC's Radiology group is a hospital-based practice known for expertise in subspecialty radiology and for maintaining a state-of-the-art imaging programs and a popular residency in diagnostic and interventional radiology.

Most of the diagnostic imaging studies for MHC patients are performed at MHC-owned hospitals and clinics. Physicians at MHC preferentially refer internally based on strong reputation of the radiologists,

high-quality imaging services, and the positive patient experience at MHC imaging sites. For the last several years, however, growth in volume has reduced access to MHC resources and patients have had to wait up to 1-2 months to undergo non-urgent, elective examinations. The long wait times have led physicians at MHC to increasingly refer their patients to the private imaging center, which although recognized to have overall slightly lower quality and service is generally able accommodate patients within 1 week of referral. In the first half of 2021, approximately 20% of imaging studies have been referred outside of MHC.

MHC needs to expand its capacity for imaging but also to maintain its brand for quality and do so in a cost-efficient manner. The C-suite leadership of MHC has suggested that the fastest and most cost-effective solution would involve purchasing the local private imaging center. There is a second, alternative option to lease a property close to the main hospital, but this would involve significant up-front investment of capital. To meet the growing demand, it is estimated that 2 new MRI scanners, 2 CT scanners, and 1 PET-CT scanner, 2 mammography units and 4 US systems will necessary. The lease terms are competitive, but the scanners, siting and construction costs are substantial. It will take more than 2 years before the newly designed center could be open to its patients, and more than 5 years before it is profitable. A third party has developed a pro forma for MHC that includes estimates for the up-front capital costs, revenue, operational expenses, and annual profit for the new center.

MHC has set up a meeting with **Radiology Solutions Group, LLC ("RSG"),** a (fictitious) privately-owned Radiology practice, 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 that is approximately 2 miles from the MHC main hospital and secured loans to purchase 2 MRI scanners, 2 CT scanners, 1 PET-CT scanner, 2 mammography units and 4 US systems (which happens to be the same footprint that MHC requires for its expansion). With its loans fully paid off, the RS Imaging Center is now fully owned by the 3 radiology partners. Over the last decade, patient volumes have increased significantly because of growth in the market and a larger number of referrals from MHC and other physicians.

The financial books recently closed for the group, allowing a review of annual revenue, operational expenses, and profit for 2020. It was a challenging year for RSG, 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 eroded from 60% 10 years ago to only 40% in 2020, and revenue per study had consistently declined. The scanners and other imaging resources in the RSG Imaging Center are now 10 years old and have lower image quality than MHC scanners and suffer from increasing downtime. The RSG 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 MHC Radiology colleagues.

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

A third-party consulting firm working with both MHC and RSG has valued the assets of the RSG outpatient imaging center between $9-12M, with no current debt service or other liabilities. The RSG partners feel that the center is worth the higher end of this range. 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 RSG. Their contracts are annual.
- The center typically performs 10,000 exams, collects revenue of $5M, has expenses of $4M, allocates $300,000 towards capital purchasing each year, though because of the COVID-19 pandemic the center operated at a loss $1.2M last year.
- Operational programs for the center were described as "acceptable, with several opportunities for improvement," with cited areas for improvement that included management, scheduling, operating hours, and revenue cycle.
- 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 MHC to purchase the RSG Imaging Center and RS to join the MHC 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 RSG radiologists by the MHC radiologist group?***

In this case discussion, you will take the role of the MHC team (comprised of the CEO, CMO and CFO) or the RSG team (one of the 3 managing partners). As a part of the exercise, the MHC team and RSG team will first meet separately and then the two groups will meet "across the table" for the negotiations. Because of COVID-19, the usual "in person" negotiations have been scheduled on Zoom.

Questions to consider for both groups before your meeting:

1. What is the primary goal for this negotiation?

2. What are the major points of self-interest for MHC and for RSG? 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. What are the metrics that you will use to gauge the success of your negotiation?

Case Study #5

"Designing the Academic Mission in an Era of
Constraints"

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

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.

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 hierarchal 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 for–ward. 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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Additional materials for this case will be distributed live during the meeting.

Case Study #6

"Academic Radiology Departments Relationships with Industry"

Matthew A. Barish, MD
Judy Yee, MD

Case 6
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 physicists 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. <u>Confidentiality</u>. 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. <u>Term; Termination</u>. 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. <u>Independent Contractor</u>. 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. <u>Indemnification; Insurance</u>.

   a. <u>General – by SkyNet</u>. 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. <u>General – by Consultant</u>. 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. <u>Indemnity for Infringement of Intellectual Property</u>. 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. <u>Notice; Counsel; Cooperation</u>. 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. <u>Insurance</u>. 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. <u>Survival</u>. This Section 8 shall survive the termination or expiration of this Agreement.

9. <u>Notices</u>. 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. <u>Miscellaneous</u>. 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. <u>Fair Market Value</u>. 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. <u>No Requirement to Purchase</u>. 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. <u>Choice of Law</u>. 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.

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 #7

"Building a Culture of Wellness and Resilience"

Carolyn C. Meltzer, MD
Cheri L. Canon, MD

Building a Culture of Wellness and Resilience

Carolyn Meltzer and Cheri Canon

You are the chair of a historically thriving radiology department with a faculty of 100 radiologists and 20 researchers. Coming out of COVID-19 pandemic, things are uncertain. After reduced imaging volumes during early months, exam volume has returned in most areas and actually higher than pre-COVID volumes in other areas. A hiring freeze was implemented by the university and you are hopeful that it will be discontinued in the coming few months.

Before COVID, changes in healthcare demand increased productivity at the expense of nonclinical (academic and administrative) time. Funds flow model implementation exacerbated this, as it is a model based primarily upon RVUs. The department compensation model (for distribution of funds flow dollars in the department) is well balanced, covering all three missions. Faculty are feeling increasing stresses, as the clinical workload not only increases in volume but in complexity, as well as the uncertainty of the pandemic. Additionally, most are engaged academic radiologists and have a passion for teaching and/or research. Further complicating the issue is decreased external support for research funding. The department implemented a very strict salary expectation for its funded researchers, requiring a minimum of 85% salary support through extramural funding sources and reduction of salary if this measure dips below 60%. The faculty as a whole is weary and struggling with many pandemic-related issues outside of work.

You have a matrixed leadership organization within the department, with division directors, chiefs for each service site, and several vice chairs. Although some in this group are relatively early in their leadership career, there is a wide breadth of experience. All have historically been very productive. However, you as chair have noticed some of the faculty, including leaders, are demonstrating signs of burnout. Faculty have disengaged, and although remain productive by clinical measures have reduced scholarly effort. Engagement scores have declined for the last several years. Additionally, two of the division directors have become disruptive. One has completely disengaged, which has resulted in loss of faculty and declining morale. The other remains highly driven, although is not spending significant time supporting faculty who are in need.

Your opinion as a chair is that your faculty is showing signs of burnout, and many of the other chairs have expressed similar concerns. You hold a series of focus groups to learn about their challenges, which are many. Themes emerge that include: 1) the informatics infrastructure is not very well integrated; 2) there is increasing frustration around the "friction" to accomplish academic goals (e.g., tedious IRB process, lack of sufficient support for the growing regulatory burden for clinical research, many meetings with little action, etc.); and 3) enormous impact of the pandemic. Yet as the chair, you feel somewhat helpless to address many of the real problems. The institution has invested in experts to discuss physician resilience.

Questions for Discussion:

1. What are some short-term steps within the department that you can take to mitigate faculty burnout?
2. What would be your "asks" of the School of Medicine dean and healthcare system CEO, given the fiscal constraints of the institution?

       a.   What data would you bring to support your request?

3.   What other strategies would you consider in addressing the issues raised by your faculty?

4.   How do you plan for emerging from a pandemic and preparing for the next?

Case Study #8

"Academic Radiology Expansion into Regional Practice"

Jocelyn D. Chertoff, MD, MS, FAUR
Michael P. Recht, MD

Academic Radiology Expansion into Regional Practice

Jocelyn D. Chertoff, MD, MS and Michael P. Recht, MD

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.

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.

Keynote Speaker

"Leadership & Identity: Forging the Future"

Reed A. Omary, MD, MS

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- Faculty Roster
- Biosketch Information

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Radiology Management Program

Aine M. Kelly, MD

Áine was born in Galway City, Ireland, and completed medical training, in Trinity College, Dublin, Ireland. Following this, she completed internal medicine residency and endocrinology fellowship in Dublin, Ireland, prior to entering radiology. Áine trained in radiology (Leeds Bradford Training Scheme, West Yorkshire, UK) and did fellowships in cardiothoracic radiology and body magnetic resonance imaging (University of Michigan, Ann Arbor, Michigan). She completed Masters Degrees in Clinical Research Design and Statistical Analysis, and in Higher Education (with Medical Concentration) while working full time.

Áine currently works in Emory University Department of Radiology and Imaging Sciences, Atlanta, Georgia, as Assistant Program Director for the Radiology Residency, Co-director of the Senior Medical Student Elective and Professor of Cardiothoracic Imaging.

Áine has received numerous commendations for her teaching efforts, both view box and conference teaching and received the Alliance for Clinical Educators Lifetime Achievement in Education Award in 2019. She served as an American Board of Radiology oral board examiner and item writer for the Exam of the Future. Áine served as Deputy Editor for Academic Radiology for five years from 2012-2018, and reviews for multiple major medical and radiological journals.

She is author of over 80 peer and non-peer reviewed articles, 1 book (Evidence Based Emergency Imaging) and 9 book chapters with a focus on evidence based medicine, quality and safety. Áine had external funding on several grants, serving as PI on 3 national radiology society grants (RSNA, ARRS and AUR) and co-PI on several others, including the National Lung Cancer Screening Trial (NLST). She has given 33 invited international presentations, 41 invited national presentations, 45 invited local presentations, presented 21 abstracts and 18 posters. Her main clinical and research interest's focus on evidence based medicine and imaging, quality and safety, mentoring and faculty development, and promoting wellness (including allyship, upstander training, workplace equity and promoting anti-racism).

Áine is past president of the Radiology Alliance for Health Services Research, past president of the Alliance of Clinician Educators in Radiology, and the Alliance for Medical Student Educators in Radiology, and served on the board of directors of the Association of University Radiologists for almost a decade.

In her free time, Áine enjoys cooking, (physically distanced, safe) socializing, amateur piano, planning to exercise, hand knitting, machine and hand-sewing, acrylic painting, keeping a reflective journal, creative novel writing, screenplay writing, creating cartoons, learning mindfulness and attempting meditation, watching PBS TV or streaming movies, reading business and psychology, mentoring/guiding/counselling friends and colleagues, as well as learning new languages, travelling and meeting new people.

Nicholas M. Beckmann, MD

Dr. Nicholas Beckmann obtained a bachelor's degree in Biology and doctorate of medicine from the University of Kansas. He completed residency training in diagnostic radiology and fellowship in Sports, Orthopedic, and Emergency Imaging at the University of Texas Health Science Center in Houston, Texas. He is currently an associate professor in the musculoskeletal section of the Department of Diagnostic & Interventional Imaging at the University of Texas McGovern School of Medicine. He is the program director of the Sports, Orthopedic, and Emergency Imaging fellowship as well as the radiology medical director for the Memorial Hermann Orthopedic and Spine Hospital.

Manickam Kumaravel, MD

Manickam "Nicks" Kumaravel, is based at the University of Texas Health Science center in Houston. He is a Professor of Radiology and Orthopedics and is the Chief of the Musculoskeletal section. His clinical training includes a residency in Orthopedics and Trauma with surgical board certifications from the United Kingdom. He is a team doctor with the NFL Texans.

Nicks is a keen educator with an interest in radiology education for high school, medical school students and for residents, fellows, and practicing radiologists in the United States and also as part of international outreach programs.

Christopher P. Hess, MD, PhD

Dr. Hess completed his residency and fellowship training in Neuroradiology at the University of California, San Francisco 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 high field and diffusion MRI and in computational neuroimaging. He 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, has published broadly in clinical and scientific journals and lectured nationally and internationally in these areas.

Reed A. Omary, MD, MS

Reed Omary, MD, MS, 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.

Judy Yee, MD

Dr. Judy 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. 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 a fellow of the American College of Radiology, the Society of Abdominal Radiology and the Society of Advanced Body Imaging.

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.

Cheri L. Canon, MD

Cheri L. Canon, M.D., FACR, FSAR, FAAWR is a Professor and Witten-Stanley Endowed Chair of Radiology in the UAB School of Medicine, as well as Chief Clinical Officer for UAB Medicine Ambulatory Practice. She sits on the UAB Medicine Joint Operating Leadership Council, the senior leadership team for the health system. She served as an oral examiner for the American Board of Radiology (ABR) for eleven years, a member of the Board of Trustees, and now sits on its Board of Governors. She was the vice chair of the American College of Radiology (ACR), chancellor on the board, and previously served as the chair of the ACR Commission on Education. She is the President of the Society of Chairs of Academic Radiology Departments (SCARD) and the co-creator of LEAD, a women's leadership development program jointly developed by SCARD and GE Healthcare. Additionally, she sits on the boards of directors for the Association of University Radiologists, the Society of Abdominal Radiology, and the Academy of Radiology Research Academic Council. She is active in the Birmingham community, is a member of the Birmingham Rotary Club, and is the immediate past president for MOMENTUM, a Birmingham women's leadership organization.

Carolyn C. Meltzer, MD

Dr. Meltzer is the William P. Timmie Professor and Chair of Radiology and Imaging Sciences, Executive Associate Dean of Faculty Academic Advancement, Leadership and Inclusion, and Chief Diversity Officer at Emory University School of Medicine. She is a neuroradiologist and nuclear medicine physician whose translational research has focused on serotonin-mediated brain function in normal aging, dementia, and other late-life neuropsychiatric disorders. She is also involved in oncologic imaging research and, while at the University of Pittsburgh, oversaw the clinical evaluation of the world's first combined PET/CT scanner. Dr. Meltzer has authored approximately 200 publications and lectured nationally and internationally.

Reflective of her commitment to academic medicine, Dr. Meltzer has served in numerous national leadership roles and professional and advisory boards including the administrative board of the AAMC Council of Faculty and Academic Societies, Advisory Council for the National Institute for Biomedical Imaging and Bioengineering, American College of Radiology Board of Chancellors, Association of University Radiologists Board, Radiological Society of North America R&E Foundation Board, and Executive Committee of the International Society of Strategic Studies in Radiology. Current roles include President-Elect of the Society for Chairs of Academic Radiology Departments, Trustee of the RSNA Board, and member of the AAMC Group on Women in Medicine and Science Steering Committee. Dr. Meltzer is a past president of the American Society of Neuroradiology and Academy for Radiology and Biomedical Imaging Research. Her contributions to academia have been recognized with the AUR Gold Medal, ASNR Outstanding Researcher Award, ASNR Gold Medal, and RSNA Outstanding Contributions in Research Award. Highly engaged in professional and leadership development and promoting inclusion, Dr. Meltzer has individually mentored more than 60 pre and post-doctoral trainees and junior faculty. Under her leadership, the Emory Radiology Leadership Academy was founded and has now graduated over 100 professionals.

Jocelyn D. Chertoff, MD, MS, FAUR

Chair of Radiology, Dartmouth-Hitchcock

VP Regional Radiology Service Line

Past President of AUR, APDR

Professor of Radiology and of Obstetrics and Gynecology, Geisel School of Medicine at Datmouth

Anthony Grise, Sectra

Anthony Grise received his B.S. in Electrical and Computer Engineering from the University of New Hampshire, Durham, NH. In his early career, Mr. Grise worked for Digital Equipment Corporation in a variety of engineering and technical roles before taking a sales executive position within Digital's healthcare organization. His primary role was to provide account management to the Harvard Teaching Hospitals in Boston, MA.

In 1995, Mr. Grise joined a start-up company. eMed Technologies, which was focused on developing early stage teleradiology and PACS software, helping to transform radiology departments from analog film to digital systems. Mr. Grise held various positions during his time with eMed, serving in a senior level management roles up until the purchase of eMed by Merge Healthcare in 2005. While at Merge, Mr. Grise held senior level management positions which included; Vice President of Sales, Vice President of Business Development and General Manager, Surgical Solutions.

Mr. Grise joined Sectra, Inc. in June of 2014 and has served as the Vice President of Sales for Sectra's U.S. market. Mr. Grise has been instrumental in increasing Sectra's market share in the U.S. and helping to grow awareness of the Sectra brand in the market. Mr. Grise has a long history in Medical imaging and is focused on increasing the effectiveness of healthcare by helping to deliver new technologies to the healthcare market.

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