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THE CASE STUDY: A VALUABLE LEADERSHIP DEVELOPMENT TOOL

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Case Method Teaching

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What is the case method?

Why use it?

What is a case?

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What Is the Case Method?

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Origins of Case Method

19th Century innovation by dean of Harvard Law School.

Students demanded that the dean be fired!

Harvard Business School adopted method in 1920s.

Students there were more docile: they did not ask that the dean be fired.

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Origins of Case Method

Method has spread widely across universities globally and disciplines, including medicine.

One member of a family of methods called active learning.

Examples of other active learning methods: problem-based learning and flipped classroom.

Characteristics of the Case Method

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Case Instructors…

Facilitate student thinking rather than tell them what to think.

Ask guiding questions to help students explore a case and develop their thinking about it.

Ask many types of questions such as open ended, clarifying, challenging, supporting, comparing.

Talk less, students talk more.

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Case Students…

Must prepare material before class and be motivated to discuss it in class.

Collaborate with each other and the instructor to give meaning to the case.

Learn primarily from each other.

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Cases…

Usually do not have objectively correct answers.

But certain conclusions are far better than others: they are supported by case evidence.

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Why Use the Case Method?

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Problem with Higher Education

Provide students with only half the education they need.

Lectures and textbooks teach concepts, theory, and frameworks efficiently.

But students do not learn how to **use** that knowledge as they will in the real world.

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Is the critical knowledge in your field most valuable as theory or as a way to make a difference in the real world?

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If it's the latter, application of knowledge needs to be practiced.

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Preferably in way that no one is hurt.

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Are situations in which you apply knowledge highly structured or not?

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Less structured = more practice required

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Knowledge is not enough.

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I got my degree from Universidad de Fútbol.

Universidad de Fútbol

I listened to many great lectures on how to play futbol.

I watched videos and saw demonstrations by expert players.

I took the tests and received perfect scores on all of them.

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However, I never practiced.

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Do I know how to play fútbol?

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Cases are a practice field for students.

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Consider…

We do not allow a doctor to practice on her own until she has practiced applying her knowledge for years.

Yet, in many fields, students are not asked to apply their knowledge in any situation that closely resembles the real world.

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Research-Based Reasons for Using Cases

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What students do in class is much more important than what teachers do.

Cases require students to do something in the classroom: make meaning from a case.

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Varying the conditions of learning makes learning harder for students but results in better learning long term.

Cases vary the conditions of learning because every case is different, even when the domain of knowledge (e.g., finance) is the same.

Changing Nature of Work

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Rise of Thoughtful Work

In advanced economies, the content of work is increasingly about analytical and creative thinking and social skills.

It is increasingly less about procedure and repetition.

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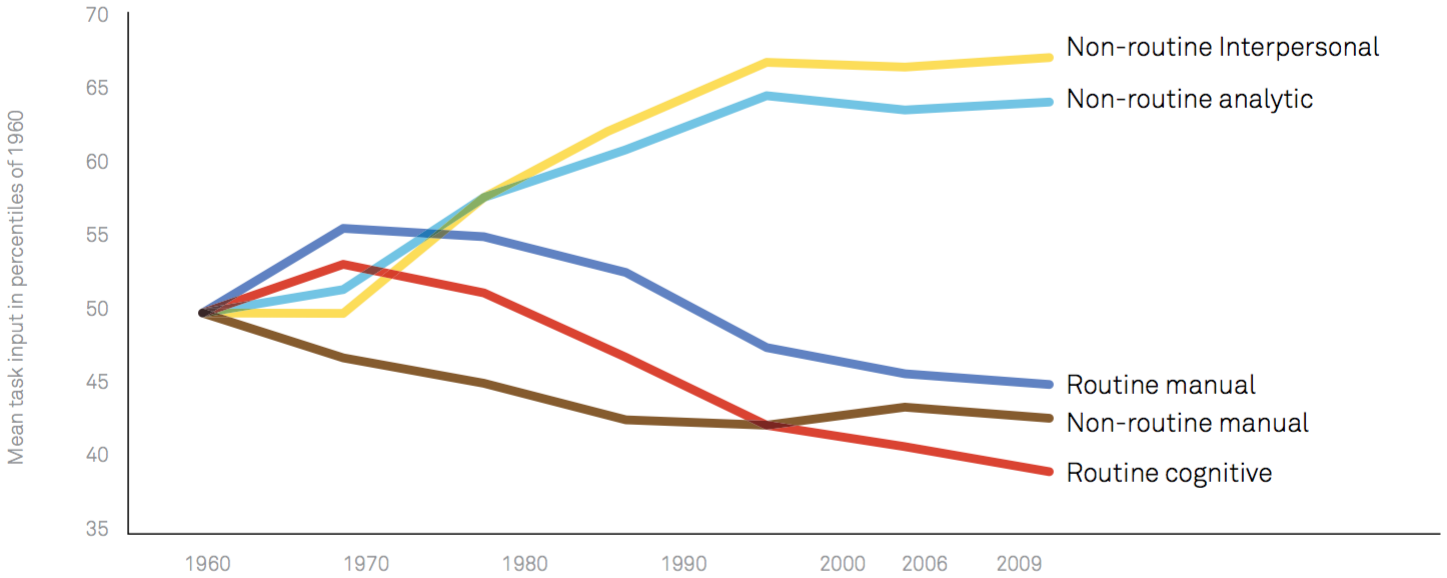
Figure 1 **Non-routine Tasks on the Rise in the U.S. Labor Market**



Source: David H. Autor and Brendan M. Price. "The Changing Task Composition of the US Labor Market: an Update of Autor, Levy and Murnane (2003)". MIT Mimeograph, Massachusetts Institute of Technology, 2013.

"The top five skills companies now seek, according to a LinkedIn analysis, are creativity, persuasion, collaboration, adaptability and time management. Their popularity outstripped more than two dozen hard skills."

—Axios, 3/29/2019

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What Is a Case?

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Textbook	Case
Conclusions	Information only, no conclusions
Linear organization	Organized disorganization
Explains meanings	Reader constructs meaning

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A Case Is...

A simulation of the real world.

Meaningless beyond the information it states about a situation.

Given meaning by the reader and people who discuss it.

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A key concept of active learning is having students construct meaning.

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Finally, dilemma for facilitators:

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At the end of a discussion, do you tell the students your opinion about the case?

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Your opinion =
the right answer

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Students have to learn how to think for themselves.

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Thank you!

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Implementing Cone Beam CT in a Community Hospital

Written by Dongxu Wang[1], Gabbie Meis[2], William Ellet[3] on behalf of AAPM Medical Physics Leadership Academy Working Group

This is a work of fiction intended to discuss the implementation of Cone Beam CT in a community hospital. Names and positions were randomly generated. Any resemblance to individuals, places, or practices, real or fictitious, is purely coincidental.

Dr. Jessica Garner had been working at Concord Hospital[4] for two months and she was still having trouble adjusting. The patients, doctors, and staff she worked with welcomed her into their community with open arms. She had been born and raised in Concord, MT and returning to it with her family was in every sense of the word a homecoming. But her years of professional training in San Francisco had left an indelible mark on her and she was having a hard time accepting the medical technology limitations she now faced.

Dr. Garner had chosen Concord, MT over a handful of open positions. After visiting the area for her interview, she knew this would be the place where she would be most comfortable settling down and raising her two young boys, and fortunately, her husband agreed. A post-interview stop at the local grocery store offered held doors and warm smiles as she picked up snacks and drinks for the long drive back to the Bay Area. She would be the first full-time, hospital-employed medical physicist at Concord, and she was determined to use her academic research for good. She appreciated that the hospital had decided to hire a staff medical physicist instead of relying on a physics consultant who stopped by once a week.

Dr. Garner was eager to implement the cone-beam computed tomography (CBCT) on the Varian 21EX Linear Accelerator (linac). The Varian 21EX had been a staple in radiation therapy treatment in the hospital's cancer clinic. She knew the standard care of three-dimensional image guided radiation therapy (IGRT) with CBCT could easily be delivered by the Varian 21EX equipped with the on-board imager. In

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4 Concord, MT is intended to be representative of a rural, upper Midwest community hospital. Any associations with actual practices anywhere is purely coincidental and unintentional.

her office Dr. Garner sat down in the comfortable nylon chair the hospital had purchased for her. She used a disinfectant wipe to clear off the thin layer of dust that had collected along the top of the computer monitor and on its stand.

She had just finished the CBCT acquisition on the linac. Everything worked fine. Now she was ready to load the CBCT in MOSAIQ on an office workstation. She clicked on the 'Review' button and there was no response. She waited, knowing the computer was significantly slower than the GPU-equipped one she had used at her previous employer, a high-ranking research hospital in San Francisco. At Concord Hospital, she was a little disappointed that the computer workstation assigned to her had low specifications. She was told it met the hospital's IT specifications, and everybody else had the same computer.

Five minutes passed and the CBCT he had acquired finally showed up in MOSAIQ. However, she couldn't scroll the image slices, move, or zoom. The image on the screen froze. She gave up and pressed "Ctrl+Alt+Dlt."

At Dr. Garner's previous position, CBCT had been common and was the go-to method for image-guided radiation therapy. She was puzzled that this hospital, which had the foresight to hire a full-time medical physicist, used computers with such poor performance. The absence of CBCT due to computer performance had to be a mistake. She decided to check with Mark Robinson, the on-site Medical Dosimetrist, who had done a lot of patient-specific quality assurance (QA) previously.

Dr. Garner found Mark upstairs in his small office, patiently waiting for a plan optimization to finish. Not wanting to startle him, Dr. Garner rapped her knuckles along the doorframe to announce her arrival. After they exchanged greetings, Dr. Garner asked whether there had been problems with CBCT review in MOSAIQ.

Mark sighed. "It's been like this forever. We've never used it successfully. We tried a few times before, but the computers couldn't handle it."

"Isn't there something we can do to fix that? A simple computer update or a new computer for the system? CBCT is commonplace. It's strange that it's not being used here."

Mark nodded, but his facial expression conveyed resignation. "I've been here for 18 years, and we seem to always have low-end computers for office work."

"But this isn't office work. It's high-tech medical work!"

"I completely agree!" Mark said. "Maybe you can change this. If you'd like, we can put in a request for new equipment, but the clinical supervisor is wary of any

additional investments in computers, and the IT department has specific requirements about which programs we're allowed to run. With those restrictions, I'm not sure if we'll be able to do much. But maybe you'll make the difference. They hired you to do the high-tech work in the first place."

Dr. Garner couldn't help noticing that his tone of voice didn't sound hopeful.

Concord Hospital's junior Radiation Oncologist, Dr. Aaron Mitchell, had joined the practice a year before Dr. Garner. He finished his residency in the same research hospital as Dr. Garner and felt blessed to be given the opportunity to practice not far from where he grew up. In the past year, he had not only convinced the hospital to hire a full-time medical physicist but was also able to recruit Dr. Garner, his residency physics mentor in San Francisco.

However, Dr. Mitchell was beginning to wonder if he had settled for the easiest option. The equipment he worked with felt clunky in comparison to the first-rate machines at his previous hospital. He had turned down an offer at his resident hospital, wanting to slow things down a bit to return to his family. After a year in Concord, Dr. Mitchell was disappointed and found himself in frequent disagreement with his senior practicing partner, Dr. David Bell.

Dr. Bell's treatment methods were straightforward, reflecting his 30+ years of practice, but Dr. Mitchell wanted to be innovative and try new treatment methods he learned during residency. However, the technology in Concord did not always allow that, and on other occasions, Dr. Bell shot him down with a stock comment: "Now, that's not how we do things here." He knew Dr. Bell had many more years of experience than he did but felt Dr. Bell was simply waiting to retire, going through the motions of practice and assigning the same treatments he had for years.

Dr. Mitchell desired to get along with his senior partner, but he didn't want to become complacent. It came down to what was best for his patients, and he knew he could and should do better by them. He checked his watch and realized he had two minutes to make it to Dr. Bell's office for their consultation with Dr. Garner.

Dr. Bell had just sat down in his office chair, the old, worn-out springs creaking into position. It was difficult not to feel obsolete when his young colleagues were often recommending new treatment regimens. Dr. Bell believed his methods were effective, within the constraints of the technology at the hospital. Dr. Mitchell would send him email after email with articles from medical journals about new methods, despite his request for printed copies of the articles. Dr. Garner also cluttered Dr. Bell's inbox with new ideas for equipment and technology, occasionally citing his own research in San Francisco. (Although he would never admit it to his younger colleagues, Dr. Bell wasn't especially comfortable with technology and even struggled with his office computer. The 'ping' that sounded when his email program received a new message annoyed him, but he hadn't yet discovered how to turn off the sound.) Dr. Bell typically read a few of the articles Dr. Mitchell emailed to him. The studies often came from hospitals with more impressive equipment than Concord could ever hope to afford. His retirement was not far off. His younger colleagues would soon have their turn.

The two were now sitting in his office for their biweekly meeting. Dr. Garner carried her laptop and a thin notebook, while Dr. Mitchell had brought a pocket-sized, leather-bound book in which he would take notes.

Dr. Garner began the conversation. "The Varian 21EX is not working at its full potential--we're not using cone-beam computed tomography."

"Well, is that important?" said Dr. Bell.

"I'd say so," said Dr. Garner. "AAPM has produced a survey showing that CBCT is the standard practice for IGRT. It's not being used here because our computers are too slow. They freeze or crash before we can review the results."

Dr. Mitchell barely resisted the urge to roll his eyes. Of course, the computers were too old to run something of that caliber. They were probably less expensive than his own ergonomic chair. "If we're not administering CBCT," he said, "we're not capturing the charges related to CBCT. I think the additional revenue would easily cover the cost of purchasing new computers."

"You're up on the research, I assume. CBCT leads to better treatment outcomes?"

There was an awkward silence that Dr. Garner broke. "There isn't definitive research evidence that it does, at least not yet. But we're sure it's a step in the right direction. In San Francisco, the doctors and patients preferred the upgrade."

Dr. Bell nodded. "OK, but I read in an article you sent me that CBCT is only useful for 40 percent of cancer cases and will improve results in a small percentage of the 40 percent. Can you prove that the cost is worth the benefit here?"

"That's a fair question," said Dr. Mitchell.

"Shouldn't we let the deep-pocketed treatment centers figure this out before we plunge ahead and spend dollars we don't have?"

"I don't think the costs are going to be prohibitive for us and we could be saving lives that would be lost otherwise," said Dr. Garner. "It might be just two or three a year, but in community this size, that makes a big difference."

No one said anything for a while.

“I don't want to seem cold hearted," said Dr. Bell. "But won't our therapists and dometrist have to be trained on the new equipment? That's going to be a significant cost for the hospital. I've seen it many times before. The implementation of new technology is much harder and more expensive than the vendor says it will be."

“I believe it’s what’s best for the hospital and for the patients,” Dr. Garner answered. “You can have better than 2 mm accuracy in target alignment with CBCT!”

“I say go for it,” said Dr. Mitchell.

Dr. Bell shrugged in response. “I think what we have works fine, but if you two agree, I don't want to stand in the way. I hope you're ready for a fight, though."

Dr. Mitchell and Dr. Garner spoke at almost the same time, "What do you mean?"

Dr. Bell looked serious. "IT isn't going to give in on expensive new computers easily. They'll be afraid that every practice in the hospital will want one. Administration will just see the cost side of upgrades and training--and mistakes. They'll see you as hotshot doctors from California who want the best, whatever it costs."

Dr. Bell paused for a moment. "This is on you--I'm not leading the charge. And I've got to give you fair warning that you'll have to make it very simple for old folk like me to use this new technology. Otherwise, I can't promise I'll prescribe it.”

Dr. Garner returned to her office to think about the conversation. She genuinely believed that using CBCT for IGRT was better for patient care and treatment outcomes. Given this new information, what does Dr. Garner think about Dr. Bell's perspective? Should Dr. Garner try to persuade Dr. Bell to make the changes she and Dr. Mitchell are proposing? What else should she consider?

- Dr. Bell
  - The younger doctors feel he needs renewed motivation
  - Is defensive against perceived challenge to his practice methodology
  - In his own mind, he is the only one weighing practicality versus the latest and greatest
  - In part, the younger doctors were brought in for change. Dr. Bell should be aware that change must come with the practice transition
  - Possible avenue to change is to provide Dr. Bell with a concrete road map forward.
  - Not necessarily the roadblock in the situation
  - He is more aware of the realities of the hospital budget

- The Younger Generation
  - There is an adjustment period from going from a large well funded institution to a community institution with limited resources and staff
  - It is important to remember a substantial investment has already been made in the CBCT upgrade to begin with. Failing to invest in the computers and training is to void the original investment
  - Seek aid from Dr. Bell's colleagues to provide peer pressure / opinions
  - Balancing respect for Dr. Bell's accomplishments versus their own training
  - If the revenue will replace the cost, why not move forward?
  - Strategize methods to excite Dr. Bell about the technology
  - Using current trend of improving safety culture as an avenue forward
  - There are more factors to consider than simple tumor cure. Also need to consider quality of life and co-morbidities that can be mitigated with new technology
  - Consider phased rollout of technology with concrete measurables to demonstrate forward progress and generate team buy-in

- Further Notes
  - The younger generation should have known to some extent that these sorts of issues would be present when they were recruited to this location
  - The young generation was drawn to the slower pace and family values. This is an example of situation that is in confrontation with the values that drew them to this community. Balance of personal and professional values
- Action Items / Path Forward
  - Dr. Garner did not get a direct “no”. Start there and move forward with measurable goals
  - Find shareable middle ground. Do not rush to full roll-out
  - Vendors are often very willing to stage a technology demonstration to convince
    - Conversely purchase or loan a higher end computer to demonstrate feasibility
  - Financial revenue and cost analysis should be incorporated into any solution
  - Clinical supervisor for the Radiation Oncology Department should be included in the discussion.
  - Purchase of all quality Assurance mechanisms and technology

- Action Items / Path Forward
  - Generate creative dialog to bring Dr. Bell around to where the solutions can come from him
  - Case can also be made to show how project implementation fulfils the current base investment in the technology that has already been made.
  - Appeal to more streamlined workflow
  - Persuasion can also be more effective if the younger doctors take some time to build trust before introducing process upheaval.
  - Follow up reading for our audience: John Kotter (author) “Leading Change” or also “That’s not how we do it here!: A story of how organizations rise and fall – and can rise again.”

- Reflection on Session:
  - This process can be a good prep for ABR part 3 for our Residents and Trainees
  - It can be key to realize there is more to our field than the solutions to technical problems
    - Professional practice involves “soft skills”
      - Leadership
      - Conflict resolution
      - Persuasive speaking
      - Project management with clear goals
  - It can be good for a practicing professional to practice considering perceptions and values other than their own.
  - Further informational materials from MPLA will include style guides for writing and submitting your own case study to share with the AAPM community
    - Hoping to award SAMS credits for participating individuals
  - These can be used to lead residents and trainees into further growth

- Future Ideas:
  - Integrating different philosophies into the clinical practice
  - Ethical considerations
    - Mistakes
    - Safety
    - Billing
    - Etc.
  - Managing Personal relationships
    - Perceived workload imbalances
    - Lining up personal strengths with tasks
  - How to say “no”
    - Effective self awareness of time and talents within yourself and department
  - Communication within the team
    - Cultural differences
    - Team building
  - Manpower / Staffing appropriately within the department