

2019 ACR-RBMA Practice Leaders Forum

Artificial Intelligence In Radiological Practice: What Radiologists Need To Know - A Contrarian View

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Disclosures

I have no relevant financial disclosures for this presentation.

Tremendous Hope for Artificial Intelligence in Radiology

Artificial Intelligence in Radiology

- Will decrease errors
- Will increase efficiency
- Will serve as a solution to declining reimbursement
- Will add value to the radiology report
- Will insure the future of our specialty by adding expertise and standardization

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AI and Radiology Errors

- Why are we sure that AI will decrease errors?
- Are computers error free?
- Do computers crash?

Computers and Mistakes

- “Computers don’t make mistakes, as such, but they can make errors.
- When your laptop crashes, it has gone into an error condition where it fails to run the computer code effectively.
- If anything, the ‘mistake’ is that of the human who produced ineffective code or faulty hardware.”

<https://www.sciencefocus.com/science/can-computers-make-mistakes/>
Accessed 12/18

Autonomous Vehicles

- Carmakers have been claiming that autonomous vehicles, or AVs, will start filling the roads by 2020 and take over by 2030. Instead, AVs are pumping the brakes, as their futuristic technology has faltered in the unpredictable chaos of real-world roads.
- (Some prototypes) would still flunk driver's ed.
- AVs sometimes react to parked cars as if they're moving, and they get overwhelmed passing through construction zones. They're shaky at challenging maneuvers like turning left against oncoming traffic.

<https://theweek.com/articles/807864/when-selfdriving-cars-take-over>

AI and Errors

- How do we know AI will decrease errors?
 - Playing chess or a quiz show game is different than actually using clinical judgement and experience.
- Does our “subjective” clinical judgement improve over time?
- And what if AI does not increase errors? What if AI just simply has overly high sensitivity and low specificity?

AI and Incidental Findings

- So, in the future will you need to comment on every renal, hepatic, or splenic lesion that the AI detects?
- Even if that lesion is too small to characterize and you know it's almost certainly benign?
- Or will you need to comment on every mass that AI detects with low level echoes on ultrasound...even though you know it's a cyst?

Low Sensitivity

- Or what if the sensitivity of AI is too low and our miss rate increases because over time there could be some rare instances where we inadvertently over rely on the technology and let our guard down?

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AI and Efficiency

- What if AI is like working an early first year resident, except that everything the AI program tags is now part of the permanent medical record, so you if you disagree with the AI, you are now held accountable by the public...
- Could that influence your efficiency?

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If AI Works Should We Be Reimbursed the Same?

- Even if AI works the way we want it to, why should payers reimburse us the same amount to interpret a case if a computer is helping us?
- We could eventually hear the argument that says your CPT code should be worth less when a computer does some of the work.
- Recollection from the RUC committee: “Why should we value the code the same if you have a prior exam? That should make it easier for you. You just have to spot the differences.”

AI and Reimbursement

- And if AI truly helps decrease us interpret a case, isn't it folly to expect that our reimbursement will not be adjusted accordingly?
- The dominant component of the work RVU is time

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AI and Value – Customer Experience

- “AI is a powerful business tool that is supporting companies and their customer service strategies. It’s creating a better customer experience.
- Today’s version of AI in the customer support world is good for very narrowly focused tasks, such as helping a customer quickly change a billing address or updating credit card information.
- (The) best recommendation for today’s version of AI is to have it support the customer service representative (CSR).”

<https://www.forbes.com/sites/shephyken/2017/12/17/will-ai-take-over-the-world/> Accessed 12/18

Thinking About AI and Value

- So if you have to call up a company to change your address or credit card number, would you rather speak to a person or a machine?
- And what if you have another question?
- How many in the audience have screamed at their phones yelling “representative” or pressing zero over and over again while in voice recognition purgatory?

Americans Worried About Autonomous Vehicles

- Americans remain deeply skeptical about their (Autonomous Vehicle (AV)) safety... In March, an...AV going 40 mph...fatally struck a 49-year-old pedestrian crossing the street in the dark when the vehicle's perception system got confused by the bicycle she was wheeling.
- Klaus Fröhlich, BMW's head of research and development, puts it...candidly: "Everyone in the industry is becoming more and more nervous that they will waste billions of dollars."

<https://theweek.com/articles/807864/when-selfdriving-cars-take-over>

AI and Perception

- So if AI works the way we want it to, will clinicians and / or the public value our expertise to the same degree?
- Could we be seen as outsourcing to a computer.....
- Is there the same skill level in that?
- How are radiologists perceived now?

“Perception is Reality” ...Coined by Lee Atwater

- Perception is reality. (A)political strategist...coined this phrase in the 1980s, and election campaigns ever since have...played out according to this tenet.
- Lee Atwater, the man responsible for the phrase, worked on George Bush Senior's campaign in 1988, in which Bush turned round a 17-point deficit to claim the White House.
- Atwater died three years later... but his creed lives...Forget the facts: if you can make people believe something, it becomes, if you like, a de facto fact.
- If people are made to believe that AI is doing much of the radiology work....

<https://www.independent.co.uk/voices/comment/perception-is-reality-the-facts-wont-matter-in-next-years-general-election-9829132.html> Accessed 12/2018

Radiology and Perception

- So, the incorrect perception of radiologists could in the future be that they are....
 - Compensated to an advantage by the RBRVS system
 - Shift workers who are allowed to sit all day and not interact
 - And (in the future) have a computer doing their work
- What could that mean for radiology in the long term.....

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Massive Disruption from Autonomous Vehicles

- The effects of AI are unknown, but think about other industries....
- “Nearly 2 million Americans drive heavy trucks for a living, and another 1.7 million drive buses, taxis, and delivery vehicles. Driverless cars could put all of those people out of work.
- Livery drivers (could) also lose jobs when (people) can rely on driverless fleets. Many other professions, from driving instructors to drive-through attendants, (could) also face massive disruption.

<https://theweek.com/articles/807864/when-selfdriving-cars-take-over>

Loss of Trucker Jobs

- A University of California, Berkeley, study predicts nearly 300,000 U.S. truckers will lose their jobs over the next 25 years to autonomous rigs.

<https://theweek.com/articles/807864/when-selfdriving-cars-take-over>

Disruption by Autonomous Vehicles

- Auto insurance
- Body Repair Shops
- Car Salespeople
- Car Dealerships
- Hotels off interstate exits
- Restaurants off interstate exits
- Tourist stops off interstate exits

Adopted from Terry O'Reilly Podcast Under the Influence

AI is Disruptive Technology

- Has PACS helped radiology?
- Has Voice Recognition helped radiology?
- Have electronic medical records helped radiology?

- Depends on who you ask.....

Reconsidering AI in Radiology

- So, as you listen to folks touting the revolutionary power of AI, consider also that AI could one day have the potential in some cases to:
 - Increase errors if it doesn't work the way it's supposed to
 - Alter radiology reimbursement
 - Alter radiologist efficiency
 - Alter the perception of a radiologist's value
 - Lead to loss of a profession?

Revolutions

- “(R)evolutions seem never to be entirely for the better or the worse, but somehow manage to combine both.”

<https://www.economist.com/special-report/2006/04/20/what-sort-of-revolution>
Accessed 12/18

Unintended Consequences

- The law of unintended consequences... is that actions of people—and especially of government—always have effects that are unanticipated or unintended.
- Economists and other social scientists have heeded its power for centuries; for just as long, politicians and popular opinion have largely ignored it.

<https://www.econlib.org/library/Enc/UnintendedConsequences.html> Accessed 12/18

AI Will Require Complete Reinvention

- “AI is what economic historians consider a “general-purpose technology” ...inventions like the steam engine, electricity, and the internal-combustion engine.
- Eventually they transformed how we lived and worked. But businesses had to be reinvented, and other complementary technologies had to be created to exploit the breakthroughs. That took decades.”

<https://www.technologyreview.com/s/611482/the-productivity-paradox/>
Accessed 12/18