

“The Current State of Supply and Demand Imbalance in Radiology and it’s Downstream Consequences: An Academic Perspective”

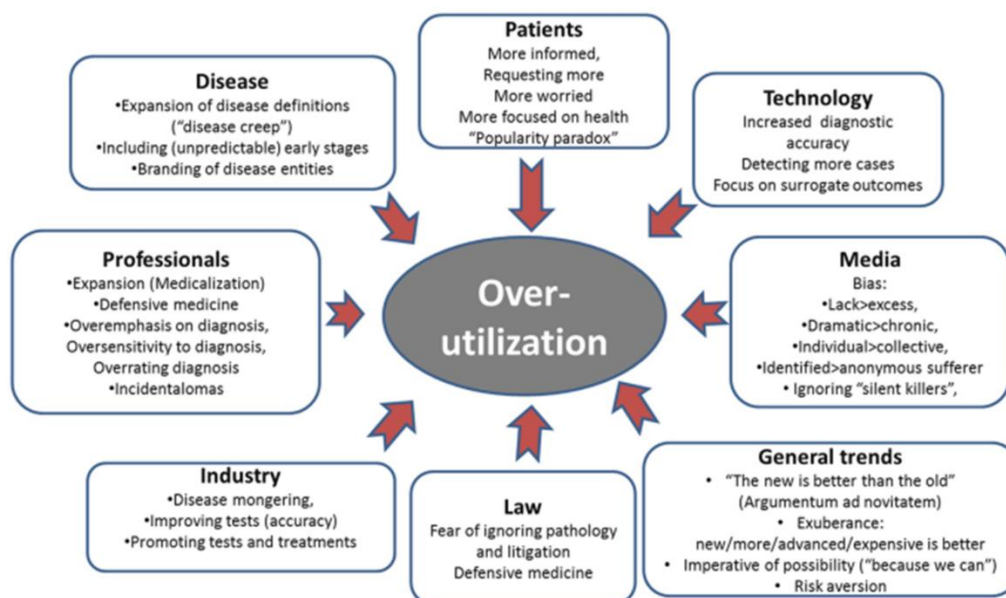
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I. Demand for Imaging is increasing exponentially

- Aging population with higher disease prevalence drives increased imaging volumes
- Epidemic of over-testing, especially in Emergency Departments also drives imaging volumes
- High degree of waste & low-value imaging utilization, (30-50%), e.g., CT for simple headache
- Complex problem, with many factors contributing
- Opportunistic Screening and pursuit of low-value incidental findings likely to worsen the demand
- ACR-AC and Clinical Decision Support have had little impact on demand growth—clinicians generally resist and find ways to circumvent these
- Currently 100 Million CT Scans are done in EDs annually, increasing by > 11 million each year
- Most ER physicians agree that too many studies are ordered, many being medically unnecessary
- A great deal of “shotgun” imaging is done, without a clear diagnostic hypothesis and in many cases without an H&P having first been performed;
- Low Efficacy for Diagnostic Imaging by Fryback & Thornbury Model (no data on patient outcomes from imaging)
- Overuse is financially rewarded under our current system.
- This figure illustrates the multiple factors involved:

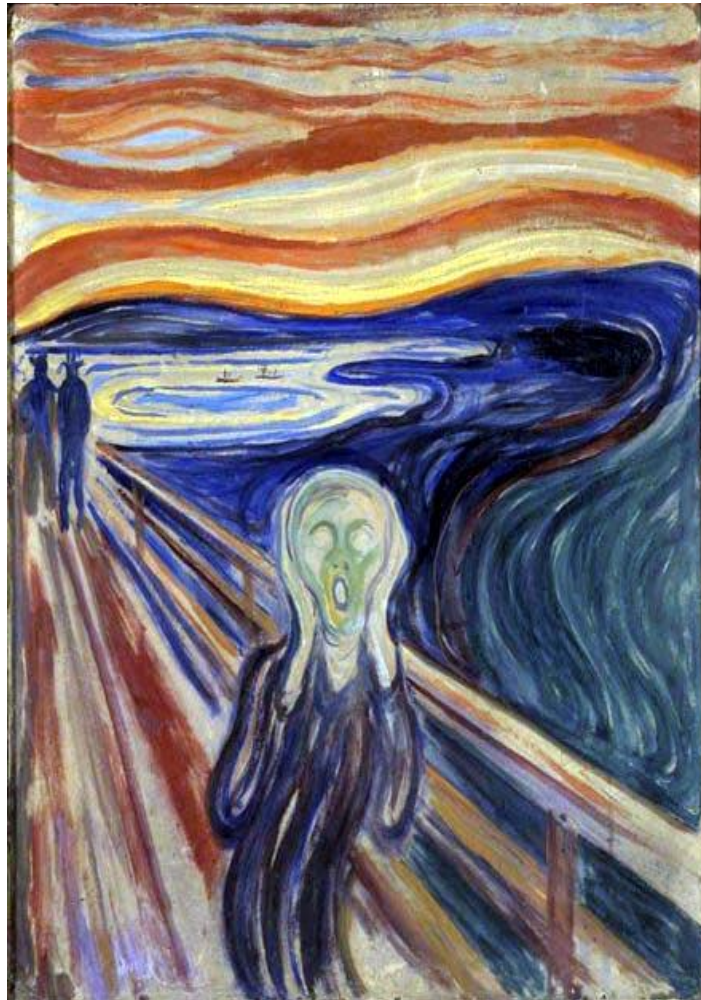


II. Supply of Radiologists (capacity) is declining

- The “Great Resignation” has led to a wave of radiologist retirements
- Current average age of practicing radiologists in the US is >51 years
- Limitations on the training pipeline – not keeping up with attrition
- Workforce shifts toward part-time & remote work – diminishing capacity
- Increasing concern for “work-life balance,” burnout, etc. – further diminishing capacity

III. Result of Demand/Capacity Mismatch:

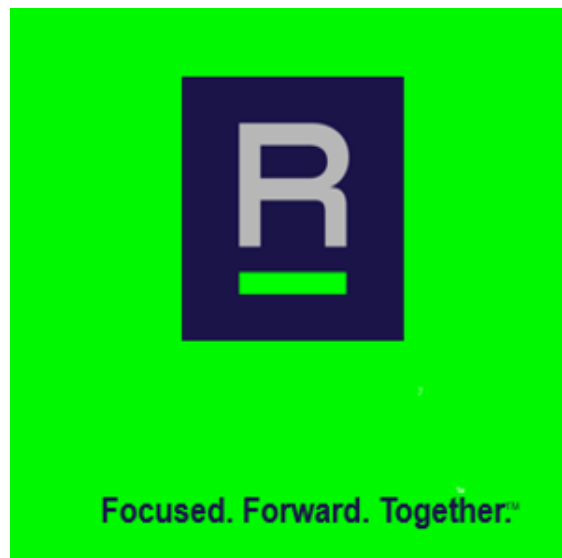
- RTAT is driven up, especially for routine/non-STAT examinations
- Patient access is threatened – long wait times and delayed care
- Backlogs of unread cases in many practices—practices falling short of their metrics
- Pressure for CMS to cut reimbursements across the board to contain exploding costs
- Outcomes Efficacy of Imaging, per Fryback & Thornbury Model, is low (and falling)



This Image Summarizes our Current State

IV. Potential Solutions

- Most urgent need is for better outcomes data to evaluate the value of imaging for specific clinical questions. Such data must be used to help eliminate the 30-50% wasteful use.
- Evidence-based guidelines which incorporate outcomes data as well as individual patient risk factors (Bayesian reasoning) and not only the ability of imaging to detect a particular disease entity if present—such revised guidelines should also clearly state under which circumstances no imaging should be done.
- Consider the potential role of the radiologist as “gatekeeper.”
- Incorporate resource-limited diagnostic reasoning, with less reliance on testing and greater tolerance for diagnostic uncertainty, into medical education nationwide.
- Develop the role of radiologist as consultants—to try to temper unrealistic clinician expectations that imaging will resolve any and all diagnostic questions.
- Payment reforms should create *disincentives* to wasteful overutilization (this would be a 180-degree reversal of the current state).
- Tort reforms would help in states where achievable; nationally, our professional societies could also take steps to censure “rogue” expert witnesses whose testimony is outside of accepted guidelines—in an effort to make the practice of following utilization guidelines a medicolegal “safe harbor” for clinicians, allowing them to withhold excess imaging.
- Increase training positions within existing radiology residency programs by finding alternate funding streams (e.g., integrated health systems, health insurers)
- Streamline “alternate pathways” for foreign-trained (English-speaking) radiologists to enter US practice.
- Strike a better balance between the “general radiologist” and subspecialists, to increase efficiency of our existing workforce.
- Increase radiologist efficiency by means of improved IT systems and integration of AI, especially AI that improves the efficiency of noninterpretive tasks.



References:

- Siewert, B., Bruno, M.A., Fleishon, H., Hublall, R., Slanetz, P.J., *et al.* “Summary of the 2022 ACR Intersociety Meeting, *JACR* 2023; May; 20(5):479-486. doi: 10.1016/j.jacr.2023.03.005
- Santavicca, S., Hughes, D.R., Fleishon, H.B., Lexa F., Rubin, E., *et al.* “Radiologist-Practice Separation: Recent Trends and Characteristics.” *JACR* 2021; Apr; 18(4):580-589
- Kanzaria HK, Hoffman JR, Probst MA, Caloyeras JP, Berry SH, Brook RH (2015) “Emergency physician perceptions of medically unnecessary advanced diagnostic imaging.” *Acad Emerg Med* 2015; 22:390–398
- Davenport, M.S. “Incidental Findings and Low-Value Care.” *AJR* 2023; 221(1):117-123
<https://doi.org/10.2214/AJR.22.289>
- Smith-Bindman, R., Miglioretti, D.L. and Larson, E.B. “Rising Use of Diagnostic Medical Imaging in a Large Integrated Health System.” *Health Affairs* 2008; 27(6): 1491-1502
- Shrank, W.H., Rogstead, T. L., Parekh, N. “Waste in the US Health Care System: Estimated Costs and Potential Savings. *JAMA* 2019; 322(15):1501-1509
- Bruno, M.A., Fotos, J.S., Pitot, M., Franceschi, A.M., Neutze, J.A., *et al.* “Factors Driving Resistance to Clinical Decision Support: Finding Inspiration in Radiology 3.0” *JACR* 2022; 19:366-376.
- Fryback, D.G., Thornbury, J.R. “The Efficacy of Diagnostic Imaging.” *Med Decis. Making* 1991; 11:88-94.

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