The Effect of AI-Enhanced Breast Imaging on the Caring Radiologist-Patient Relationship

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AI in Breast Radiology

- AI has been applied to breast imaging across 2D and 3D mammography, ultrasound, and MRI.
  - The ACR Data Science Institute lists 22 FDA-approved AI systems for breast radiology.

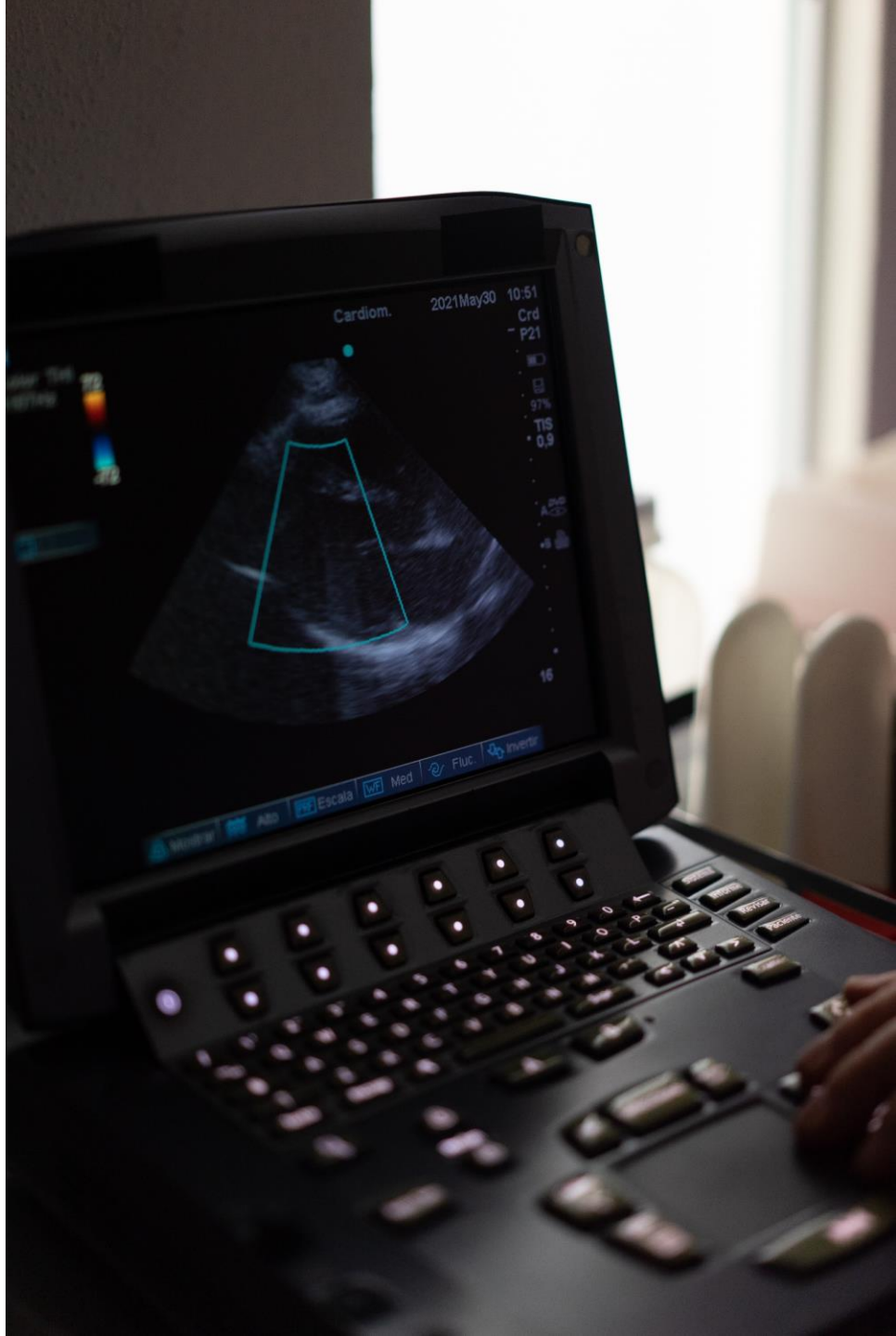
How is clinical use of AI affecting the relationship between radiologist and patient?

Clinical Framework

The 21st Century Cures Act[1]

Assumptions

- All AI systems are diagnosis (CADx) or detection (CADe) systems.
- The patient is aware of the use of AI.
- The radiologist is involved with image acquisition, analysis, and communication of results.



1. 21st Century Cures Act, in *H.R.34*. 2016.

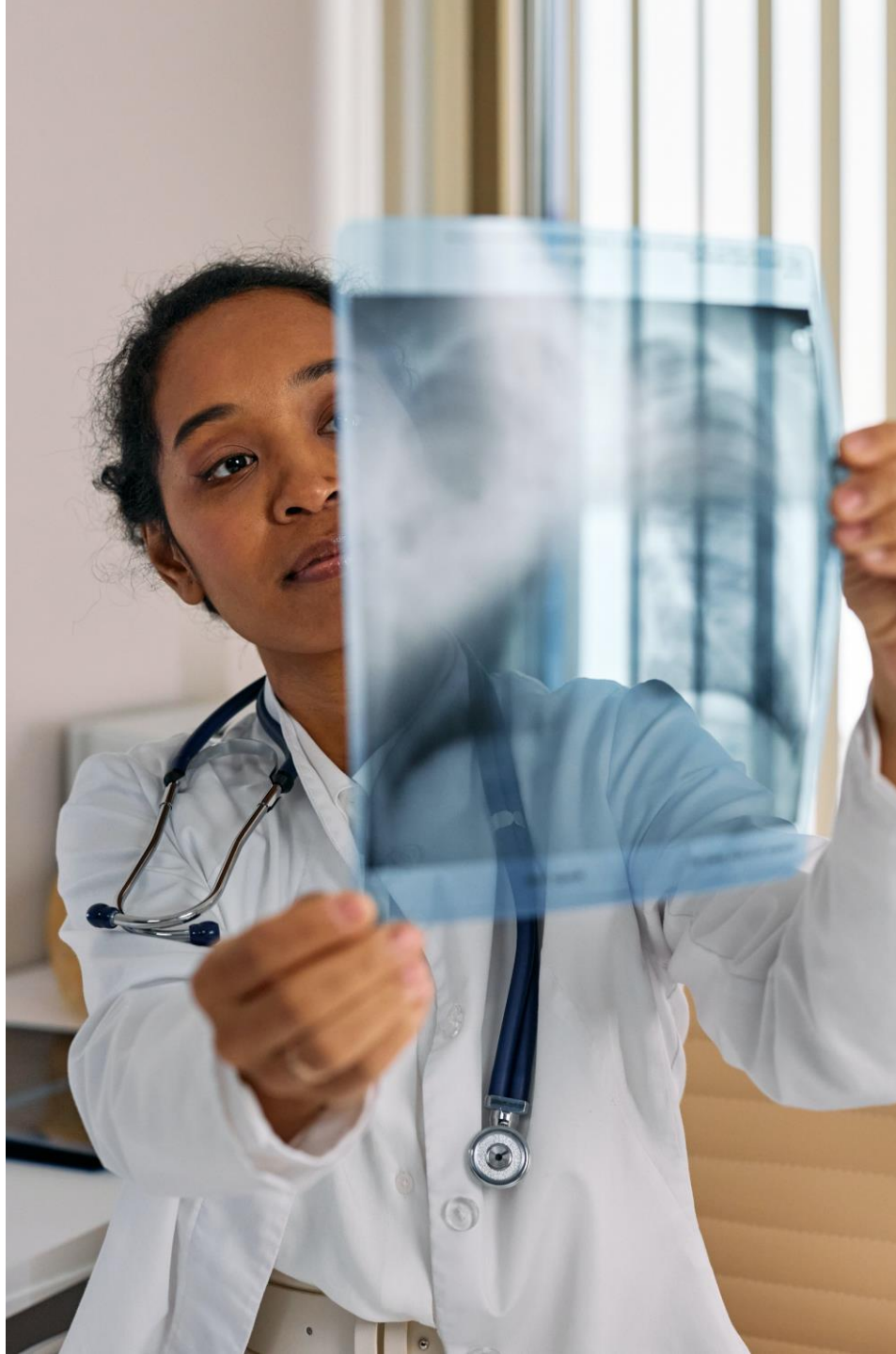
Ethics of Care

- Moral responsibility derives from our nature as embodied, interdependent, relational beings.
- We all experience some level of vulnerability during our lifetimes that puts us in need of care from others.
- Medical care is “necessary” care; one typically cannot provide it for oneself[2].
- There is an inherent power imbalance in radiologist-patient relationships.

Why Care Ethics?

Care ethics is an ethical framework that supports shared decision-making in radiology.

The integration of AI into the patient-centered breast radiology practice need not disrupt the formation or maintenance of a caring radiologist-patient relationship.



Tronto's Framework for Care[2]

- Four reciprocal elements of care are necessary for the construction of every caring relationship.
  - **Attentiveness:** The need for care is recognized so caring can begin.
  - **Competency:** The needed care is administered well.
  - **Responsiveness:** Caring is adjusted based on the communicated needs of the cared-for.
  - **Responsibility:** The caregiver assumes responsibility for the results of their care.

2. Tronto, J.C., *Consent as a Grant of Authority: A Care Ethics Reading of Informed Consent*. 2008, Cambridge University Press. p. 182-198
3. Dalmiya, V., *Why Should a Knower Care?* Hypatia, 2002. **17**(1): p. 34-52.
4. Noddings, N., *Caring: a relational approach to ethics & moral education*. 2nd ed. 2013, Berkeley: University of California Press.

Attentiveness

- Exam-time AI can disrupt the interaction between radiologist and patient.
- Over-interaction with AI impacts patient trust in their radiologist.

The caring radiologist keeps AI interaction to a minimum or relegates AI to non-real-time use.

Competency

- AI has been shown in research settings to outperform breast radiologists in examining imaging.

- Accepting that AI provides more accurate diagnoses comes with risks:
  - Skill erosion
  - Damage a patient’s trust in radiologist competency
  - Challenge radiologist epistemic authority

How Can Radiologists Demonstrate Competency?

When the patient receives AI results independently:

- Providing adequate medical framing of AI decisions.

If the radiologist and the AI system **agree**:

- Becoming a communicator of AI results.

If the radiologist and the AI system **disagree**:

- Re-establishing epistemic authority.

Responsiveness

- The patient is responsible for communicating their response to administered care.
- The radiologist is responsible for:
  1. Adjusting care
  2. Communicating care adjustment

- Responsiveness is achieved only through recognizing care as dialogic.

Risks to Responsiveness after AI Integration

- AI decisions are not *a priori* centered around patient value-systems
- AI cannot accept feedback from the patient

Radiologists display responsive care when they modify their communication of AI results to both the epistemological position and emotional state of their patient.

Responsibility

- Reliability vs. Trustworthiness
  - AI cannot add to radiologist trustworthiness
  - Consistency vs. goodwill in decisions

The radiologist is responsible for the effects AI may have on their patient and thus must engage in AI safety and monitoring protocols.

Responsibility

Radiologists' *responsibility* for patient care need not erode with the use of AI but can evolve to include more humanistic, non-medical aspects of care, resulting in clearer radiologist-patient communication and improved patient outcomes.

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Tronto's Framework for Care[2]

- Four phases of care:
  - **Caring about:** Identifying caring needs.
  - **Caring for:** Accepting responsibility for administering care.
  - **Caregiving:** Meeting the identified caring need.
  - **Care-receiving:** Is the caring need met?

2. Tronto, J.C., *Consent as a Grant of Authority: A Care Ethics Reading of Informed Consent*. 2008, Cambridge University Press. p. 182-198