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KARNATAKA RADIOLOGY EDUCATION PROGRAM

CLINICAL RESEARCH – BRIDGING IMAGING & INNOVATION

SESSION – 15 – ETHICAL DILEMMAS IN RADIOLOGY PRACTICE & RESEARCH



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ETHICAL DILEMMAS IN RADIOLOGY PRACTICE & RESEARCH



- ✓ ETHICS IS THE FOUNDATION OF MEDICAL PRACTICE.
- ✓ RADIOLOGY PRESENTS UNIQUE ETHICAL DILEMMAS DUE TO TECHNOLOGICAL ADVANCEMENTS, PATIENT PRIVACY CONCERNS, AND RESEARCH CHALLENGES.
- ✓ **CORE ETHICAL PRINCIPLES IN RADIOLOGY**
 - ✓ **AUTONOMY** – PATIENT'S RIGHT TO INFORMED DECISIONS.
 - ✓ **BENEFICENCE** – ACTING IN THE BEST INTEREST OF THE PATIENT.
 - ✓ **NON-MALEFICENCE** – "DO NO HARM."
 - ✓ **JUSTICE** – FAIR DISTRIBUTION OF HEALTHCARE RESOURCES.



THE INCIDENTAL FINDING DILEMMA

- ✓ A ROUTINE MRI FOR HEADACHES REVEALS A SUSPICIOUS MASS.
- ✓ THE PATIENT WAS NOT EXPECTING THIS AND MAY NOT WANT TO KNOW.
- ✓ **ETHICAL CONFLICT:** SHOULD YOU DISCLOSE AN INCIDENTAL FINDING THAT MAY LEAD TO PATIENT ANXIETY OR UNNECESSARY INTERVENTIONS?



THE INCIDENTAL FINDING DILEMMA


- ✓ **ASSESS THE FINDING:** VERIFY THE SIGNIFICANCE OF THE INCIDENTAL FINDING. CONSULT WITH COLLEAGUES OR SPECIALISTS IF NECESSARY TO DETERMINE THE POTENTIAL IMPLICATIONS.
- ✓ **PATIENT COMMUNICATION:** APPROACH THE CONVERSATION WITH SENSITIVITY. EXPLAIN THE NATURE OF THE FINDING AND THE POTENTIAL IMPLICATIONS, EMPHASIZING THAT IT WAS UNEXPECTED AND REQUIRES FURTHER EVALUATION TO DETERMINE ITS SIGNIFICANCE.
- ✓ **PROVIDE SUPPORT:** OFFER RESOURCES FOR SUPPORT, SUCH AS COUNSELING OR PATIENT ADVOCACY SERVICES, TO HELP THE PATIENT PROCESS THE INFORMATION AND MAKE INFORMED DECISIONS.
- ✓ **DOCUMENT THE DISCUSSION:** ENSURE THAT THE CONVERSATION AND THE PATIENT'S RESPONSES ARE THOROUGHLY DOCUMENTED. THIS MAINTAINS TRANSPARENCY AND ACCOUNTABILITY IN THE DECISION-MAKING PROCESS.

THE OVERUSE OF IMAGING ISSUE

- ✓ EXCESSIVE CT SCANS CAN INCREASE CANCER RISKS.
 - ✓ DEFENSIVE MEDICINE VS. PATIENT SAFETY.
 - ✓ **SCENARIO:** A PATIENT INSISTS ON A CT SCAN DESPITE CLINICAL GUIDELINES ADVISING AGAINST IT.
- QUESTION:** SHOULD YOU ORDER THE SCAN TO SATISFY THE PATIENT OR ADHERE TO ETHICAL MEDICAL PRACTICE?



THE OVERUSE OF IMAGING ISSUE

- ✓ **EXPLAIN CLINICAL GUIDELINES:** CLEARLY COMMUNICATE TO THE PATIENT WHY CLINICAL GUIDELINES ADVISE AGAINST THE CT SCAN. HIGHLIGHT THE POTENTIAL RISKS, SUCH AS INCREASED RADIATION EXPOSURE AND THE ASSOCIATED CANCER RISKS.
 - ✓ **ALTERNATIVE DIAGNOSTICS:** EXPLORE ALTERNATIVE DIAGNOSTIC METHODS THAT ARE SAFER AND STILL EFFECTIVE. THIS CAN HELP ADDRESS THE PATIENT'S CONCERNS WITHOUT RESORTING TO UNNECESSARY SCANS.
 - ✓ **PATIENT EDUCATION:** PROVIDE COMPREHENSIVE INFORMATION TO HELP THE PATIENT UNDERSTAND THE REASONING BEHIND YOUR RECOMMENDATION. EMPHASIZE THAT THEIR HEALTH AND SAFETY ARE YOUR TOP PRIORITIES.
 - ✓ **INFORMED DECISION:** IF THE PATIENT STILL INSISTS ON THE CT SCAN AFTER UNDERSTANDING THE RISKS AND ALTERNATIVES, DOCUMENT THE CONVERSATION AND ENSURE THEY ARE MAKING AN INFORMED DECISION.
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ARTIFICIAL INTELLIGENCE IN RADIOLOGY – ETHICAL CONSIDERATIONS

✓ AI IS REVOLUTIONIZING DIAGNOSTICS, BUT ERRORS AND BIAS EXIST.

✓ WHO IS RESPONSIBLE IF AI MISDIAGNOSES A PATIENT?

✓ **SCENARIO:** AN AI SYSTEM INCORRECTLY FLAGS A NORMAL SCAN AS CANCEROUS, LEADING TO UNNECESSARY PROCEDURES.

QUESTION: WHO IS ACCOUNTABLE—THE AI DEVELOPER OR THE RADIOLOGIST WHO RELIES ON AI?



ARTIFICIAL INTELLIGENCE IN RADIOLOGY – ETHICAL CONSIDERATIONS

- ✓ **RADIOLOGIST'S ROLE:** AS MEDICAL PROFESSIONALS, RADIOLOGISTS MUST USE THEIR CLINICAL JUDGMENT AND EXPERTISE IN CONJUNCTION WITH AI OUTPUTS TO MAKE ACCURATE DIAGNOSES.
- ✓ **DEVELOPER'S ROLE:** AI DEVELOPERS HAVE A RESPONSIBILITY TO CREATE RELIABLE AND ACCURATE SYSTEMS, CONSTANTLY IMPROVING ALGORITHMS TO MINIMIZE ERRORS AND BIASES.
- ✓ **SHARED RESPONSIBILITY:** ENSURING PATIENT SAFETY INVOLVES COLLABORATION AND ACCOUNTABILITY FROM BOTH RADIOLOGISTS AND DEVELOPERS, WITH TRANSPARENT COMMUNICATION AND CONTINUOUS IMPROVEMENT.

PATIENT PRIVACY & DATA SECURITY



- ✓ RADIOLOGY IMAGES CONTAIN PERSONAL HEALTH INFORMATION (PHI).
- ✓ RISKS OF UNAUTHORIZED ACCESS, AI DATA BREACHES, AND RESEARCH EXPLOITATION.
- ✓ **SCENARIO:** A RADIOLOGY RESIDENT SHARES AN INTERESTING X-RAY ON SOCIAL MEDIA (WITHOUT PATIENT IDENTIFIERS).

QUESTION: IS THIS A PRIVACY BREACH?



PATIENT PRIVACY & DATA SECURITY

- ✓ **EVALUATE THE IMAGE:** DETERMINE IF THE IMAGE CONTAINS ANY IDENTIFYING INFORMATION, EVEN INDIRECTLY. SOME UNIQUE OR UNUSUAL FINDINGS MIGHT BE RECOGNIZABLE TO OTHERS.
- ✓ **OBTAIN CONSENT:** IF SHARING THE IMAGE IS NECESSARY FOR EDUCATIONAL PURPOSES, OBTAIN EXPLICIT CONSENT FROM THE PATIENT. THIS ENSURES TRANSPARENCY AND RESPECTS THEIR AUTONOMY.
- ✓ **INSTITUTIONAL POLICIES:** FOLLOW THE GUIDELINES AND POLICIES OF THE MEDICAL INSTITUTION REGARDING SHARING MEDICAL IMAGES AND INFORMATION ON SOCIAL MEDIA.



RESEARCH ETHICS IN RADIOLOGY

- ✓ INFORMED CONSENT IN IMAGING RESEARCH.
- ✓ USE OF ANONYMIZED PATIENT DATA FOR AI TRAINING.
- ✓ **SCENARIO:** A NEW AI-BASED TOOL NEEDS LARGE AMOUNTS OF RADIOLOGY DATA.
- QUESTION:** SHOULD HOSPITALS USE PATIENT IMAGES WITHOUT EXPLICIT CONSENT FOR RESEARCH?



RESEARCH ETHICS IN RADIOLOGY

✓ **PATIENT CONSENT:** PRIORITIZE OBTAINING EXPLICIT CONSENT FROM PATIENTS WHEN USING THEIR DATA FOR RESEARCH.

THIS ENSURES TRANSPARENCY AND RESPECTS PATIENT AUTONOMY.

✓ **DATA ANONYMIZATION:** IMPLEMENT ROBUST ANONYMIZATION TECHNIQUES TO MINIMIZE THE RISK OF RE-IDENTIFICATION.

✓ **ETHICAL OVERSIGHT:** ENSURE THAT THE RESEARCH IS CONDUCTED UNDER STRICT ETHICAL GUIDELINES AND OVERSIGHT BY
AN INSTITUTIONAL REVIEW BOARD (IRB).

✓ **COMMUNICATION:** CLEARLY COMMUNICATE THE BENEFITS AND RISKS OF USING ANONYMIZED DATA FOR AI TRAINING TO
PATIENTS AND THE PUBLIC.

RADIATION EXPOSURE ETHICS

- ✓ BALANCING DIAGNOSTIC NECESSITY VS. RADIATION RISKS.
 - ✓ PEDIATRIC IMAGING AND ALARA (AS LOW AS REASONABLY ACHIEVABLE) PRINCIPLE.
 - ✓ **SCENARIO:** A PHYSICIAN REQUESTS REPEATED CT SCANS FOR A CHILD WITH MILD SYMPTOMS.
- QUESTION:** SHOULD YOU REFUSE BASED ON RADIATION SAFETY, OR COMPLY WITH THE PHYSICIAN'S REQUEST?



RADIATION EXPOSURE ETHICS

- ✓ **EVALUATE CLINICAL JUSTIFICATION:** ASSESS WHETHER THE REPEATED CT SCANS ARE CLINICALLY JUSTIFIED FOR THE CHILD'S MILD SYMPTOMS. CONSIDER ALTERNATIVE IMAGING METHODS (E.G., MRI OR ULTRASOUND) THAT DO NOT INVOLVE RADIATION.
- ✓ **EDUCATE THE PHYSICIAN:** DISCUSS THE POTENTIAL RISKS OF RADIATION EXPOSURE WITH THE REQUESTING PHYSICIAN, EMPHASIZING THE IMPORTANCE OF ADHERING TO THE ALARA PRINCIPLE.
- ✓ **INVOLVE A MULTIDISCIPLINARY TEAM:** IF NECESSARY, CONSULT WITH A PEDIATRIC RADIOLOGIST OR A MULTIDISCIPLINARY TEAM TO REVIEW THE CASE AND MAKE AN INFORMED DECISION.
- ✓ **COMMUNICATE WITH THE PARENTS:** CLEARLY EXPLAIN THE RISKS AND BENEFITS OF REPEATED CT SCANS TO THE CHILD'S PARENTS, ENSURING THEY ARE INFORMED AND INVOLVED IN THE DECISION-MAKING PROCESS.

DISCLOSURE OF ERRORS IN RADIOLOGY

- ✓ SHOULD A RADIOLOGIST DISCLOSE A MISSED DIAGNOSIS AFTER A SECOND REVIEW?
- ✓ TRANSPARENCY VS. FEAR OF LEGAL CONSEQUENCES.
- ✓ **SCENARIO:** A RADIOLOGIST OVERLOOKS A SMALL LUNG NODULE THAT LATER PROGRESSES INTO CANCER.
- QUESTION:** SHOULD THE RADIOLOGIST INFORM THE PATIENT AND PHYSICIAN ABOUT THE ERROR?



DISCLOSURE OF ERRORS IN RADIOLOGY

- ✓ **REVIEW THE CASE:** CONDUCT A THOROUGH REVIEW OF THE INITIAL DIAGNOSIS AND THE SUBSEQUENT FINDINGS. GATHER ALL RELEVANT INFORMATION AND DOCUMENTATION.
- ✓ **CONSULT WITH COLLEAGUES:** SEEK INPUT FROM COLLEAGUES, INCLUDING AN ETHICS COMMITTEE IF AVAILABLE, TO ASSESS THE BEST COURSE OF ACTION.
- ✓ **PREPARE FOR THE DISCUSSION:** PLAN HOW TO COMMUNICATE THE ERROR TO THE PATIENT AND PHYSICIAN WITH EMPATHY AND TRANSPARENCY. BE PREPARED TO EXPLAIN WHAT LED TO THE OVERSIGHT AND THE STEPS TAKEN TO RECTIFY THE SITUATION.
- ✓ **DISCLOSE THE ERROR:** INFORM THE PATIENT AND PHYSICIAN ABOUT THE MISSED DIAGNOSIS, EMPHASIZING THE IMPORTANCE OF ADDRESSING THE ISSUE PROMPTLY. OFFER SUPPORT AND RESOURCES TO MANAGE THE SITUATION.
- ✓ **DOCUMENT THE DISCLOSURE:** ENSURE THAT THE CONVERSATION AND THE STEPS TAKEN ARE THOROUGHLY DOCUMENTED. THIS MAINTAINS TRANSPARENCY AND ACCOUNTABILITY.

ETHICAL DILEMMAS IN TELERADIOLOGY

- ✓ GLOBAL OUTSOURCING OF RADIOLOGY REPORTING.
- ✓ DIFFERENCES IN MEDICAL STANDARDS ACROSS COUNTRIES.
- ✓ **SCENARIO:** A TELERADIOLOGIST MISINTERPRETS AN X-RAY IN A DIFFERENT COUNTRY.

QUESTION: WHO IS LIABLE—THE REMOTE RADIOLOGIST OR THE LOCAL HEALTHCARE PROVIDER?



ETHICAL DILEMMAS IN TELERADIOLOGY

- ✓ **REVIEW CONTRACTS AND AGREEMENTS:** EXAMINE THE CONTRACTS AND AGREEMENTS BETWEEN THE TELERADIOLOGY SERVICE PROVIDER AND THE LOCAL HEALTHCARE PROVIDER. THESE DOCUMENTS OFTEN OUTLINE THE RESPONSIBILITIES AND LIABILITIES OF EACH PARTY.
- ✓ **CONSULT LEGAL AND ETHICAL GUIDELINES:** SEEK GUIDANCE FROM LEGAL AND ETHICAL FRAMEWORKS IN BOTH COUNTRIES TO UNDERSTAND THE IMPLICATIONS OF THE MISINTERPRETATION.
- ✓ **QUALITY CONTROL MEASURES:** IMPLEMENT ROBUST QUALITY CONTROL MEASURES TO MINIMIZE THE RISK OF ERRORS IN TELERADIOLOGY REPORTING. THIS INCLUDES REGULAR AUDITS, PEER REVIEWS, AND CONTINUOUS TRAINING FOR RADIOLOGISTS.
- ✓ **COMMUNICATION AND COLLABORATION:** FOSTER OPEN COMMUNICATION AND COLLABORATION BETWEEN THE REMOTE RADIOLOGIST AND THE LOCAL HEALTHCARE PROVIDER TO ENSURE ACCURATE AND TIMELY DIAGNOSES.

ETHICAL USE OF CONTRAST MEDIA

- ✓ RISKS OF ALLERGIC REACTIONS VS. NECESSITY FOR DIAGNOSIS.
- ✓ INFORMED CONSENT BEFORE CONTRAST INJECTION.
- ✓ **SCENARIO:** A PATIENT REFUSES CONTRAST DUE TO PAST MILD ALLERGY, BUT IT'S CRUCIAL FOR ACCURATE DIAGNOSIS.
- QUESTION:** SHOULD YOU PROCEED WITH IMAGING OR RESPECT THE PATIENT'S REFUSAL?



ETHICAL USE OF CONTRAST MEDIA

- ✓ **DISCUSS THE RISKS AND BENEFITS:** CLEARLY EXPLAIN THE IMPORTANCE OF THE CONTRAST INJECTION FOR AN ACCURATE DIAGNOSIS AND THE POTENTIAL RISKS ASSOCIATED WITH BOTH THE INJECTION AND THE ABSENCE OF IT.
- ✓ **ALTERNATIVE OPTIONS:** EXPLORE ANY ALTERNATIVE IMAGING METHODS OR APPROACHES THAT MIGHT BE USED WITHOUT CONTRAST OR WITH A DIFFERENT TYPE OF CONTRAST AGENT THAT THE PATIENT MAY NOT BE ALLERGIC TO.
- ✓ **MONITOR AND MITIGATE RISKS:** IF THE CONTRAST INJECTION IS DEEMED NECESSARY, DISCUSS PRE-MEDICATION OR OTHER MEASURES TO MINIMIZE THE RISK OF AN ALLERGIC REACTION.
- ✓ **DOCUMENT THE CONVERSATION:** ENSURE THAT THE PATIENT'S DECISION, THE INFORMATION PROVIDED, AND THE STEPS TAKEN ARE THOROUGHLY DOCUMENTED TO MAINTAIN TRANSPARENCY AND ACCOUNTABILITY.

ETHICAL DECISION-MAKING FRAMEWORK IN RADIOLOGY

- ✓ **RECOGNIZE** THE ETHICAL ISSUE.
- ✓ **ANALYZE** THE CONFLICT BETWEEN PRINCIPLES.
- ✓ **CONSULT** PROFESSIONAL GUIDELINES AND
LEGAL ASPECTS.
- ✓ **DECIDE & JUSTIFY** THE BEST COURSE OF
ACTION.



ETHICAL DECISION-MAKING FRAMEWORK IN RADIOLOGY

Step	Details
Issue	Publication of medical images risking patient privacy
Principles	Privacy vs. Transparency
Guidelines	AMA, RSNA, HIPAA/GDPR
Decision	Anonymize images before publication
Justification	Balances privacy with transparency, ensuring ethical and legal compliance

THANK YOU

