

Risk Management In Radiology Units: Managing An Acute Adverse Event In A Radiology Department

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Abstract

The health and therapeutic services sector is one of the basic sectors of the economy. It is a sector that has a specialized workforce and modern technology that provides various health and therapeutic services to members of society. In order for services to be produced and provided at the appropriate level and quality in this department, conditions must be provided that are safe from hazards and hazards so that work can be done in a good manner. Risk is the opportunity or probability of incurring a loss or an adverse event occurring that may cause injury to patients or medical practitioners. There are various reasons for the risks of harm and injury in radiology departments, and one of the aims of this paper is to investigate some of the reasons. This will prompt consideration of some of the approaches used in risk management in radiology. This paper aims to examine risk management in a radiology department, and this will be achieved through a comprehensive evaluation of the risk control measures used in a radiology department. It has been observed that the main focus of risk management in such a medical setting is to reduce and eliminate harm and injury to patients by incorporating various medical precautions. The field of radiology is evolving rapidly due to technological advances and the globalization of health care. This continued development will have a significant impact on the quality of care and service delivery. Thus, risk management in radiology is essential to protect patients, radiologists and the medical organization in terms of capital and expand the reputation of the medical organization with patients.

Keywords: therapeutic services, radiology.

Introduction

The world is witnessing a massive information and technological revolution, which in turn has contributed to the development of all aspects of life, especially in the field of medical

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imaging and interventional radiology. Therefore, there are uncertainties and concerns about standards of care, maintaining the safety of medical practitioners and patients, and risk management in radiology.

Radiation is everywhere around us, and is divided into ionizing and non-ionizing radiation. Ionizing radiation has enough energy to damage matter when it interacts with it, such as beta particles, alpha rays, gamma rays, and X-rays. Radiation plays an important role in the medical field, as it helps diagnose many diseases and is also used as a treatment for cancer [1]. However, radiation has harmful effects on health, such as increasing the risk of cancer and distorting genetic mutations [2]. Radiography or radiology is “an imaging process used to depict anatomical structures.” Instead of visible light, radiography uses X-ray energies that penetrate the body” [3]. X-rays are a type of ionizing radiation widely used in medicine and have many diverse equipment and procedures for their use. During X-ray imaging, the rays are transmitted through the desired organ, and the X-rays are absorbed by different tissues to varying degrees due to different densities between tissues [4].

Ionizing radiation contains high energy that can cause a component of a cell to change as it travels through living tissue. The severity and type of health effect are related to the duration and amount of radiation exposure, however, the risks have not been determined and there is no safe level of exposure to ionizing radiation [5].

Therefore, radiology departments in hospitals play an important and effective role in improving the quality of health care and services provided, through early diagnosis and treatment of diseases. However, fatigue, radiation dose, risks from equipment damage and other external factors negatively affect the quality of services provided to patients as well as to staff. Risk management seeks to identify and evaluate risks in order to control available resources to reduce the probability and reduce the chances of unfortunate events occurring. Therefore, risk management in radiology is essential in protecting patients and medical radiologists [6].

In general, one of the most important goals of national policies in all countries of the world is to achieve sustainable development that positively affects the future of human development, the environment and natural resources. In January 2014, the Health, Public Health and Care System Sustainable Development Strategy 2014-2020 was released, setting out a vision for a sustainable framework for health and social care by reducing carbon outflows, planning communities for extraordinary climate events, securing natural assets and developing healthy lifestyles and environments. [7].

Therefore, awareness of radiation risks and attention to protection principles is extremely important, especially among medical practitioners. This prompts consideration of risk management methods in the field of radiology.

Risk management.

Safeguarding patients and personnel

In many areas of health services, especially in hospitals, there are important risk factors in relation to occupational health and safety. Rapid expansion of services, globalization of health care, and imbalance between workload and workforce are among the factors that may threaten health service standards as well as patient safety [6]. There is an increasing demand for radiologists and services that are available 24 hours a day, 7 days a week. Therefore, international teleradiology is driving the globalization taking place in the field of radiology [7]. To meet expectations of quality services, systems must be put in place to pave the way for achieving higher standards of care. Quality systems are effective measures to control risks, hence the importance of professional organizations to lead, create, support and improve these risks [8]. Quality improvement measures range from quality maps,

measurable metrics and performance indicators to audits and accreditation programmes. These collective efforts may reduce departmental risks and benefit patients[9].

Radiology managers and physicians should focus on improving the overall quality of care that medical staff provide to patients. Radiologists put themselves at risk every time they perform a procedure, because some of the techniques and tools they use in scanning and imaging are complex[11]. Hence, healthcare actors must work carefully and diligently to ensure that health risks to patients and themselves are minimized. In practice, inherent risks to safety and quality arise in terms of staff availability, workload, and financial dilemmas. They consist of insufficient funding for new equipment in the workplace, difficulty retaining professionals, escalating complexity of work, increasing workload, difficulty recruiting due to national shortage of medical staff and low budget that does not keep up with current requirements. .

Radiologists must convince administrators and managers that standards of care are closely related to performance measures such as workload, diagnostic accuracy, and patient safety concerns[12]. Therefore, managers must make reasonable decisions about resource allocation and performance expectations to reflect this reality and minimize risks[10]. All health workers must identify in advance some problems that lead to harm to patients and work on them before subjecting the patient to operations that may go wrong[13]. The concept of ALARP, or “as low as practicable,” basically refers to assessing risks and comparing those risks to the amount of time, money, and resources needed to address them. It is used throughout the healthcare system and is of particular importance when it comes to radiology. When assessing whether a risk is ALARP, it is necessary to compare the proposed measures with those that would normally be used, also known as “good practice”. Good practices are identified after detailed discussion with stakeholders. However, good practice is not always enough, and if the issue is particularly complex, or if good practice for the issue has not yet been formulated, it is often necessary to return to the “first principle”. In short, ALARP is about calculating the magnitude of the risks associated with measures, and assessing how difficult it is to control those risks, in terms of resources. It offers those who use it a great deal of flexibility, because it involves setting goals, allowing room for maneuver if necessary.

Risk management allows radiologists to focus on measures to reduce potential risks. This ensures that medical staff follow appropriate and relevant protocols and guidelines to minimize risks in radiology departments [14].

Professional competence and equipment

Medical practitioners in the department must ensure that their knowledge and skills are up to date. To achieve competencies and mastery in their areas of expertise, radiologists must perform their duties within the limits of their understanding and competence [15]. This allows them to do what they understand best, thus reducing the likelihood of causing danger, harm or injury to patients [8]. This requirement is closely related to the recommendation that radiologists need to maintain high trust and confidentiality with their clients by establishing a professional relationship [16]. Furthermore, workers achieve competence in the medical field if they understand and appreciate the benefits of collaborating with other professionals in their field [17]. This means that to reduce risks in radiology departments, doctors need to work as a team, combine their knowledge and skills and, most importantly, share their expertise as a means of promoting excellence in their field [18].

Modern radiology depends largely on the application of the latest diagnostic and therapeutic devices, but this new technology carries risks. To avoid the risks associated with the use of defective equipment in the radiology sector, quality assurance departments must take care to ensure that all equipment used is in good condition and of high quality [19].

Managing risks related to the use of therapeutic devices requires that all professionals possess sufficient knowledge, skills and technical ability to operate devices, recognize when they malfunction and identify inaccurate results.

By incorporating the appropriate radiology skills and operational strategies, specialists can ensure the highest levels of accuracy. Achieving excellent results and assured reporting procedures highlights the department's efficiency, indicating the department's use of protocols and guidelines focused on reducing operational and decision-making risks.

Error disclosure and malpractice litigation

Reducing errors in a radiology department can be achieved if all parties in the department are aware of and up to date with all methods and protocols used in risk reduction [20].

One can manage litigation risk in a radiology department through a number of approaches. Healthcare professionals should establish and follow high standards of care, exercise caution when using devices outside the scope of classification [21,22], improve communication skills with colleagues and patients [24] and obtain professional liability insurance.

Stakeholders, including radiologists, must possess important competency, knowledge, and skills in working with all tools within a radiology department as a means of reducing the number of errors [24]. Every radiologist must be aware of sources of error, especially those that typically constitute the origins of litigation [25]. Medical staff must detect and emphasize the risks of errors to prevent recurrence of errors [16].

In the future, various factors will shape radiological malpractice: the emergence of new imaging techniques, innovation in image processing, new protocols published by scientific societies and guidelines defined by professional organizations [23]. To reduce risks, medical staff must develop a culture of safety in each radiology department and recognize reactions to potential error as a learning experience [24]. Radiologists and other key players in the department need to understand that their practice and performance contribute significantly to patients' trust in them [25]. Radiologists need to provide good standards of practice and care and show respect for the patient [27].

Detecting radiological errors in patients stands out as the most demanding challenge a radiologist may face. With a misguided approach to error detection, radiologists risk not meeting professional standards as well as creating irregular and unsafe practice patterns [28].

Failure to acknowledge responsibility and be transparent about errors undermines patient safety. However, risk management concerns about litigation have long prevented the adoption of error disclosure standards. More recently, risk managers have emphasized that clear detection following radiological errors is critical to risk management and can reduce liability exposure [29].

Discrepancy, errors and critical incidents

Integrated teamwork between radiologists supports risk reduction and prevents any problem that could cause harm or injury to patients through inadequate reporting, leading to unreliable results [30]. Radiologists must justify their individual decisions and actions. For practitioners to manage risks in the radiology sector, they need to learn from past mistakes and, more importantly, screen for critical clinical cases and near misses. Physicians are prone to making errors, but incorporating certain operational decisions and measures can reduce the rate of errors and near-misses [31].

Risk management is based on the idea that mistakes can happen and that processes and procedures can sometimes go wrong. Therefore, holding regular meetings where medical staff can report and evaluate discrepancies, errors and near misses is crucial [22]. Contrast meetings are invaluable in clinical practice and provide the opportunity to evaluate current

practice and highlight areas that may need improvement [32]. The Royal College of Radiologists recommends that all radiologists attend discrepancies meetings and morbidity and mortality meetings. Evidence of attendance may be needed to support revalidation, so clinicians should conduct personal reflections [33]. Inappropriate behavior, such as unethical handling of patient records and willful negligence, are contributing factors to errors. However, medical staff can mitigate this factor by adhering to administrative and/or organizational procedures and protocols [18].

Conclusion

Hospitals today are among the most important advanced treatment centers, which have great importance from an economic, humanitarian and moral perspective. For many years, due to the presence of risks and dangers inherent in the activities of this category of healthcare institutions, the observance of safety and health principles has been given special attention in them, and it is emphasized that observance of these matters leads to an increase in the effectiveness of activities, efficiency and, finally, an increase in productivity. The field of radiology is evolving rapidly due to technological advances and the globalization of health care. The importance of risk management comes from the importance of providing safety for workers and maintaining the safety of equipment. Qualified staff and proper management increase safety, productivity and quality of services provided to patients. The quality of the radiological report depends on the various important steps described above. The essence of risk management is to survey all possible causes of an inaccurate report in advance so that procedures can be put in place to prevent them. Most importantly, the medical organization providing radiology services needs to allow for innovation and responsive measures that can improve radiology. Therefore, risk management in radiology is essential to protect patients, radiologists, and medical organizations.

References

1. Gupta, T. (2013). Radiation, ionization, and detection in nuclear medicine (pp. 451-494). Heidelberg: Springer.
2. Mettler, F. A. (2012). Medical effects and risks of exposure to ionising radiation. *Journal of Radiological Protection*, 32(1), N9.
3. Martin, C. J. (2007). Optimisation in general radiography. *Biomedical imaging and intervention journal*, 3(2).
4. Hoheisel, M. (2006). Review of medical imaging with emphasis on X-ray detectors. *Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment*, 563(1), 215-224.
5. Frischknecht, R., Braunschweig, A., Hofstetter, P., & Suter, P. (2000). Human health damages due to ionising radiation in life cycle impact assessment. *Environmental impact assessment Review*, 20(2), 159-189.
6. Craciun, H., Mankad, K., & Lynch, J. (2015). Risk management in radiology departments. *World journal of radiology*, 7(6), 134–138. <https://doi.org/10.4329/wjr.v7.i6.134>
7. Sustainable Development Unit (2016). Sustainable development in the health and care system e Health Check 2016 [Online] <https://www.sduhealth.org.uk/policy/strategy/reporting/sustainable-development-inhealth-and-care-report-2016.aspx>
8. Mendiratta-Lala M, Eisenberg RL, Steele JR, Boiselle PM, Kruskal JB. Quality initiatives: measuring and managing the procedural competency of radiologists. *Radiographics*. 2011;31:1477–1488. [PubMed] [Google Scholar]
9. Lau L. Leadership and management in quality radiology. *Biomed Imaging Interv J*. 2007;3:e21.

10. Chakraverty S, Wright J. Adverse events in British hospitals. "Errors meetings" in radiology did not identify errors leading to complaints and litigation. *BMJ*. 2001;322:1425–1426; author reply 1427. [PMC free article]
11. Bruno MA, Nagy P. Fundamentals of quality and safety in diagnostic radiology. *J Am Coll Radiol*. 2014;11:1115–1120.
12. Kruskal JB, Eisenberg R, Sosna J, Yam CS, Kruskal JD, Boiselle PM. Quality initiatives: Quality improvement in radiology: basic principles and tools required to achieve success. *Radiographics*. 2011;31:1499–1509.
13. Halpin SF. Medico-legal claims against English radiologists: 1995-2006. *Br J Radiol*. 2009;82:982–988.
14. Epstein RM, Hundert EM. Defining and assessing professional competence. *JAMA*. 2002;287:226–235
15. Gunderman RB, Beckman ES. Confidentiality: an essential element of professionalism. *AJR Am J Roentgenol*. 2012;199:W683–W685.
16. Alkasab TK, Harvey HB, Gowda V, Thrall JH, Rosenthal DI, Gazelle GS. Consensus-oriented group peer review: a new process to review radiologist work output. *J Am Coll Radiol*. 2014;11:131–138
17. Chandy J, Goodfellow T, Vohrah A. Clinical governance in action: radiology. *Hosp Med*. 2000;61:326–329.
18. European Society of Radiology (ESR) Renewal of radiological equipment. *Insights Imaging*. 2014;5:543–546.
19. Association of Healthcare Technology Providers for Imaging, Radiotherapy and Care. Declining investment in Radiology Equipment stores up problems for the NHS
20. Gunderman RB, Brown BP. Teaching interpersonal and communication skills. *Acad Radiol*. 2012;19:1589–1590.
21. Whang JS, Baker SR, Patel R, Luk L, Castro A. The causes of medical malpractice suits against radiologists in the United States. *Radiology*. 2013;266:548–554.
22. Baker SR, Whang JS, Luk L, Clarkin KS, Castro A, Patel R. The demography of medical malpractice suits against radiologists. *Radiology*. 2013;266:539–547
23. The Royal College of Radiologists. Standards for the NPSA and RCR Safety Checklist for Radiological Interventions. London: The Royal College of Radiologists; 2010
24. Sokol DK. Law, ethics, and the duty of care. *BMJ*. 2012;345:e6804.
25. Pinto A, Brunese L. Spectrum of diagnostic errors in radiology. *World J Radiol*. 2010;2:377–383
26. Quinn MA, Wilcox A, Orav EJ, Bates DW, Simon SR. The relationship between perceived practice quality and quality improvement activities and physician practice dissatisfaction, professional isolation, and work-life stress. *Med Care*. 2009;47:924–928
27. Kaldjian LC, Jones EW, Wu BJ, Forman-Hoffman VL, Levi BH, Rosenthal GE. Disclosing medical errors to patients: attitudes and practices of physicians and trainees. *J Gen Intern Med*. 2007;22:988–996.
28. Hannawa AF. "Explicitly implicit": examining the importance of physician nonverbal involvement during error disclosures. *Swiss Med Wkly*. 2012;142:w13576.
29. Brown SD, Lehman CD, Truog RD, Browning DM, Gallagher TH. Stepping out further from the shadows: disclosure of harmful radiologic errors to patients. *Radiology*. 2012;262:381–386.
30. The Royal College of Radiologists. Specialty standards and supporting information for revalidation. London: The Royal College of Radiologists; 2010.
31. Driscoll DO, Halpenny D, Guiney M. Radiological error—an early assessment of departmental radiology discrepancy meetings. *Ir Med J*. 2012;105:172–174.
32. Brady A, Laoide RÓ, McCarthy P, McDermott R. Discrepancy and error in radiology: concepts, causes and consequences. *Ulster Med J*. 2012;81:3–9.

33. The Royal College of Radiologists. Personal reflection on discrepancies and adverse events. London: The Royal College of Radiologists; 2010.