



Clinical Audit – A Necessity in Radiation Medicine

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Outline

- ▶ **Background about Clinical Audit**
- ▶ **Audits in Radiation Medicine**
- ▶ **Need for Audits**
- ▶ **Types of Audits**
- ▶ **Scope of Audits**
- ▶ **Requirements for Auditors**
- ▶ **Audit reporting**
- ▶ **Summary**



Clinical Audit

Journal of Radiotherapy in Practice

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Original Article

Quality assurance in radiotherapy on a national level from Norway: the KVIST initiative

Acta Oncologica, 2013; Early Online: 1–9

ORIGINAL ARTICLE

Dosimetric inter-institutional comparison of radiotherapy centres: Results of IAEA supervised planning system audit

EDUARD GERSHKVITSH¹, CSILLA PESZNYAK², BO JOSEPH GREZDO⁴, KRZYSZTOF CHELMINSKI⁵, MARGA DO CARMO LOPES⁶, JOANNA IZEWSKA⁷ & JACOB VAN DYK^{7,8}

Journal of Radiation Research, Vol. 58, No. 3, 2017, pp. 372–377
doi: 10.1093/jrr/rww108
Advance Access Publication: 18 November 2016

Multicentre dose audit for clinical trials of radiotherapy in Asia

Hideyuki Mizuno^{1*}, Shigekazu Fukuda¹, Akifumi Fukunaga², Yuzuru-Kutsutani Nakamura¹, Cao Jianping², Chul-Koo Nana Supriana⁴, To Anh Dung⁵, Miriam Joy Calaguas⁶, C.R. B. Yaowalak Chansilpa⁸, Parvin Akhter Banu⁹, Masooma Raza¹⁰, Surya Esentayeveva¹¹, Shingo Kato¹², Kumiko Karasawa¹³ and Hiroomko Ito¹⁴

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DOI: <http://dx.doi.org/10.7314/APJCP.2013.14.5.2829>
Clinical Audit in Radiation Oncology in Delhi, India

RESEARCH ARTICLE

Clinical Audit in Radiation Oncology in Delhi, India: An Academic Perspective

Jaspreet Kaur

Abstract

The objective was to assess the quality of medical institution in terms of cancer diagnosis, treatment and compliance with standards. The audit was analyzed for the audit cycle I and II in 14.2%, stage RT appointment; 669 and from registration to time to start RT.



ESTABLISHMENT OF AN EXTERNAL AUDIT GROUP FOR RADIOTHERAPY IN ISRAEL

Morris Tatcher, Consultant, Soreq Nuclear Research Center, Yavneh, Israel
Menachem Margaliot, Soreq Nuclear Research Center, Yavneh, Israel
Sergio Faermann, Soroka Medical Center, Beer-Sheva, Israel

The External Audit Group (EAG) was set up in Israel in 1997 in the framework of the International Atomic Energy Agency (IAEA) audit programme. When the group was first established, 10 members of the group were drawn from

An Audit on the Quality of Intra-Oral Digital Radiographs Taken in a Postgraduate Paediatric Dentistry Setting

Anas Salami, Manal Al Halabi, Iyad Hussein, Mawlood Kowash

Mohammed Bin Rashid University of Medicine and Health Sciences, Dubai

Abstract

Background: Quality assurance (QA) for radiographs sustains accurate diagnostic information while maintaining radiation doses as low as reasonably achievable (ALARA). **Aims:** To audit the quality of digital intraoral periapical (IOPAs) and bitewings (BWs) radiographs taken in a postgraduate paediatric dentistry setting. **Standards:** The National Radiological Protection Board (NRPB) guidance describes three grades of radiograph quality. Excellent (Grade 1 >70% of total exposures), diagnostically acceptable (Grade 2 <20%) and unacceptable (Grade 3 <10%). **Methodology:** A pilot study was performed on 10 IOPAs and 10 BWs. 50 IOPAs and 50 BWs were reviewed in 2 audit cycles with a 6 month interval (total of 200 X-rays). **Results:** First Cycle: Of 50

The Institute

Radiation therapists and Level I Australian Clinical Dosimetry Service

JOERG LEHMANN, JOHN KENNY, JESSICA LYE, TOMASZ KUCZYNSKI
AUSTRALIAN CLINICAL DOSIMETRY SERVICE, AUSTRALIA
NUCLEAR SAFETY AGENCY, AUSTRALIA

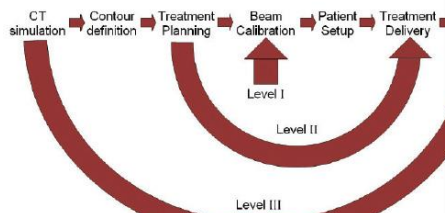


Figure 1: Levels of Audits. Level I: Linac output under reference conditions, Level II: Treatment delivery, Level III: End-to-End test. Based on T. Kenny et al.



Clinical Audit

- ▶ **Clinical Audit** is a quality improvement process that seeks to **improve patient care and outcomes**.
- ▶ Aspects of the structure, processes, and outcomes of care are selected and systematically evaluated against **explicit criteria**.
- ▶ Where indicated, **changes are implemented** at an individual, team, or service level and further monitoring is used to **confirm improvement** in healthcare delivery.

(Nice 2002)

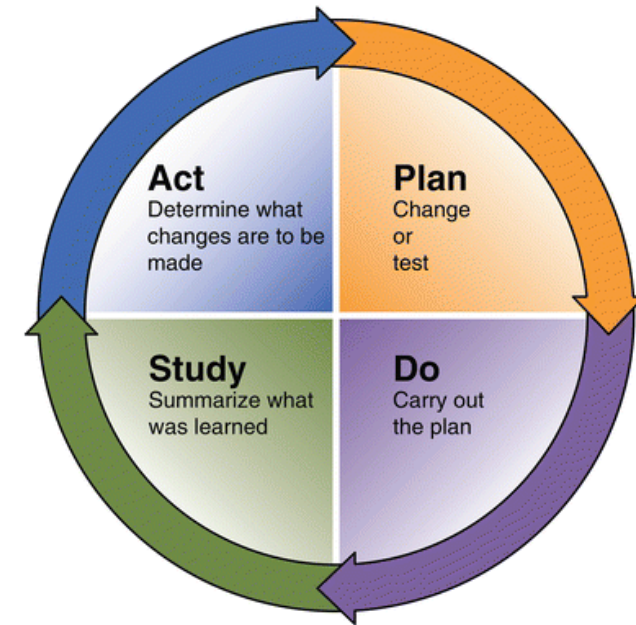




Clinical Audit

► Quality Management System (QMS):

- ✓ Ensures that clinical service delivery is consistent.
- ✓ Has four main components:
 - quality planning (QP)
 - quality assurance (QA)
 - quality control (QC)
 - quality improvement (QI)
- ✓ Is focused not only on the quality of service, but also on the **means** to achieve it.





Clinical Audit

▶ Quality Assurance (QA):

- ✓ All **procedures** that ensure consistency of the medical service delivery and safe clinical practices in accordance with set standards.

▶ Quality Control (QC):

- ✓ Sets of **measurements/tests** performed on medical equipment to ensure high performance.

▶ Quality Improvement (QI)

- ✓ is a systematic, formal approach to the **analysis** of practice performance and efforts to **improve performance**.





Audits in Radiation Medicine

“

Clinical audit is a **systematic examination** or review of medical radiological procedures which **seeks to improve the quality and the outcome of patient care**, through structured review whereby radiological practices, procedures, and results are examined against agreed standards for good medical radiological procedures, with modifications of the practices where indicated and the application of new standards if necessary.

”

(Commission of the European Communities, 97/43/Euratom)



Audits in Radiation Medicine

Quality Assurance

Quality Assurance (QA) programme in diagnostic radiology is :

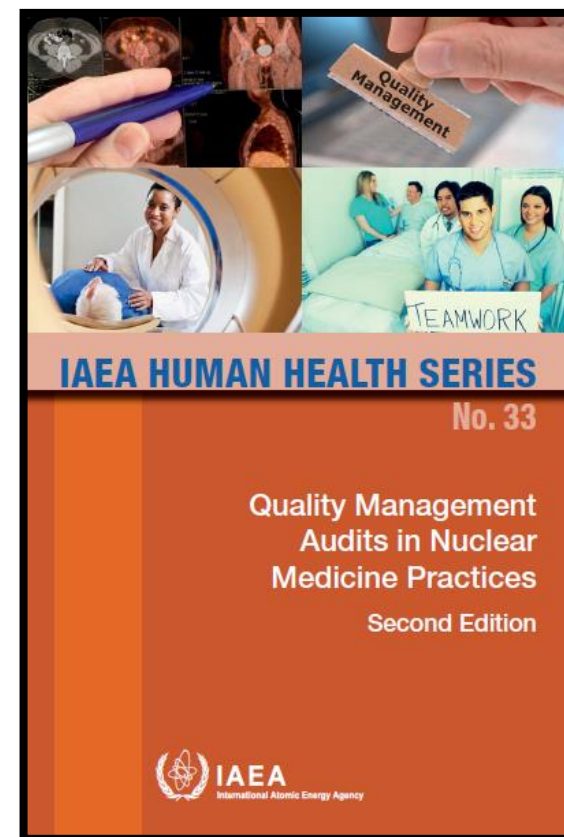
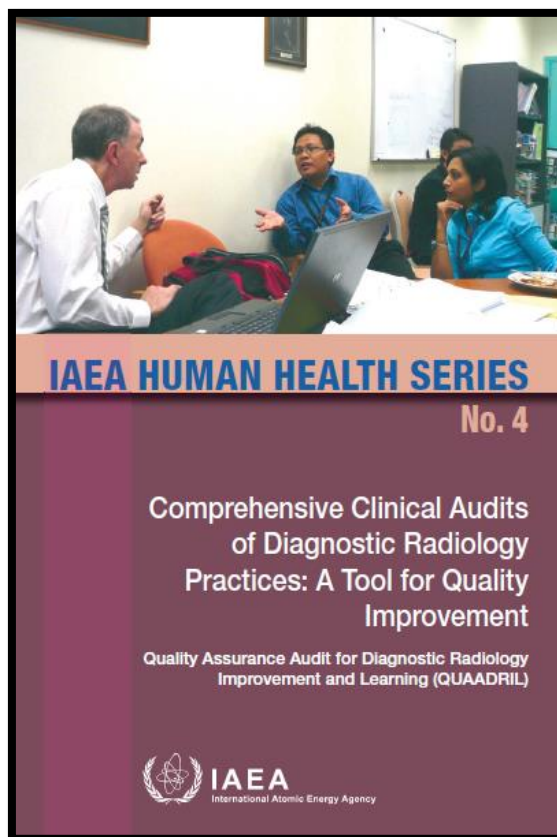
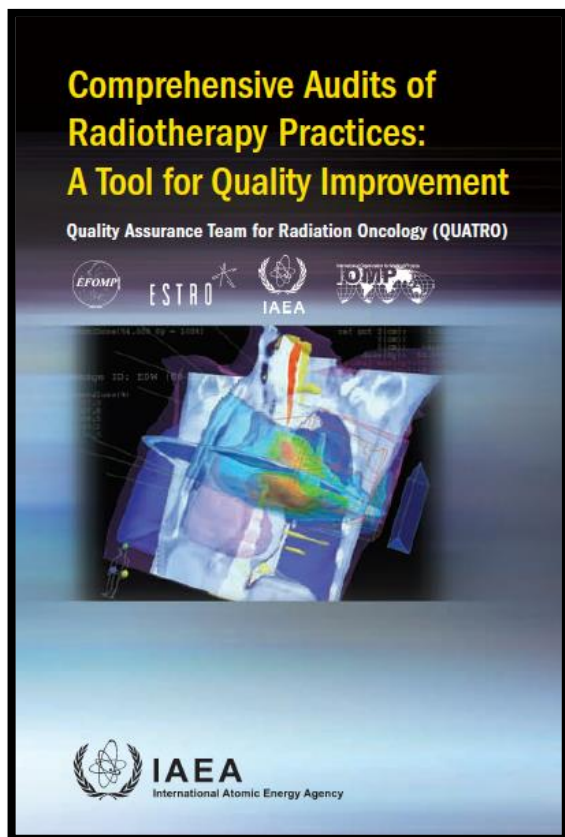
*“as an **organized effort** by the staff operating a facility to ensure that the diagnostic images produced are of sufficiently high quality so that they **consistently provide adequate diagnostic information at the lowest possible cost and with the least possible exposure of the patient to radiation**”*

World Health Organization [WHO], 1982.





Audits in Radiation Medicine





Audits in Radiation Medicine

Quality assurance for medical exposures

3.170. Registrants and licensees, in applying the requirements of these Standards in respect of management systems, shall establish a comprehensive programme

3.172. Registrants and licensees shall ensure that regular and independent audits are made of the programme of quality assurance for medical exposures, and that their frequency is in accordance with the complexity of the radiological procedures being performed and the associated risks.

assurance for medical exposure include, as appropriate to the medical radiation facility:

81

IAEA Safety Standards for protecting people and the environment

Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards

Jointly sponsored by
EC, FAO, IAEA, ILO, OECD/NEA, PAHO, UNEP, WHO



General Safety Requirements Part 3
No. GSR Part 3





The Need for Audits

► Audit in Radiation Medicine are performed :

- ✓ To **strengthen** a centre's QA programme.
- ✓ To ensure that **requirements** for patient/staff/public protection are met.
- ✓ To serve as **guidance** for further departmental development.
- ✓ To seek recognition as a centre of **competence** nationally and internationally.
- ✓ To **document gaps** in technology and practices in order to solicit funding from national authorities or other funding bodies, including IAEA.
- ✓ For support in an application to become an **accredited training centre**.
- ✓ For **improved clinical practice**.



The Need for Audits

- ▶ **Audits are NOT designed** :
 - ✓ For **regulatory purposes**, i.e. the teams are not convened as an enforcing tool but solely as an impartial source of advice on quality improvement.
 - ✓ For **Investigation of accidents** or reportable medical events (misadministration).
 - ✓ As an assessment tool for entry into **collaborative clinical research studies**.



Types of Audits

▶ Internal Audit - Physics

- ✓ Auditor is from **within** the centre being audited (**independence is eliminated**).
- ✓ Auditor reviews **only physics components** and is expected to be **impartial**.

▶ External Audit (Remote or On-site) - Physics

- ✓ Auditor(s) are **external** to the centre being audited (**independence is guaranteed**).
- ✓ Audit networks are mostly established
- ✓ Auditor reviews **only physics components** and is expected to be **impartial**.

▶ Comprehensive Audit

- ✓ Auditor(s) review **all components** of radiation medicine practices at the centre to enhance the quality of practice (QUATRO, QUAADRIL, QUANUM)



External Audit (Network Models)

▶ Round Robin Model

- ✓ Several centres team up into an audit network and auditing is performed in a round robin fashion (centres take turns to **audit each other**).

▶ Standing Audit Team

- ✓ One **audit team** moves round different centres at national, sub-regional or regional level.

▶ National Audit Service

- ✓ An established **national** dosimetry audit service audits the centres in the country and could extend its services across borders.

▶ Remote Audit Service

- ✓ Auditing is done **remotely** between audit networks (e.g. IAEA TLD postal audit).



Scope of Comprehensive Audits

► Comprehensive Audit covers:

- ✓ Layout of radiological facility/centre.
- ✓ Available equipment.
- ✓ Equipment testing and performance (QC).
- ✓ Availability of QC manuals and QA committee.
- ✓ Imaging / treatment protocols.
- ✓ Staffing levels.
- ✓ Patient / staff / public protection and safety.
- ✓ Workload.
- ✓ Record keeping and documentation.





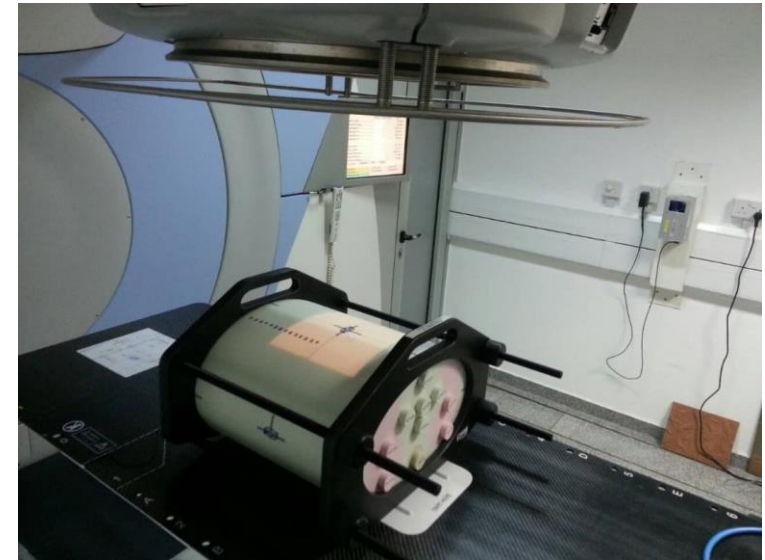
Requirements for Auditors

► Auditors are required to:

- ✓ Be **familiar** with the audit procedures, discuss the audit approach and assign responsibilities among themselves;
- ✓ Review all **background** information provided on the centre being audited;
- ✓ Request **additional** information from the centre, if necessary;
- ✓ Provide a **comprehensive report** about the audit to management of the centre.
- ✓ Keep audit findings **highly confidential**.

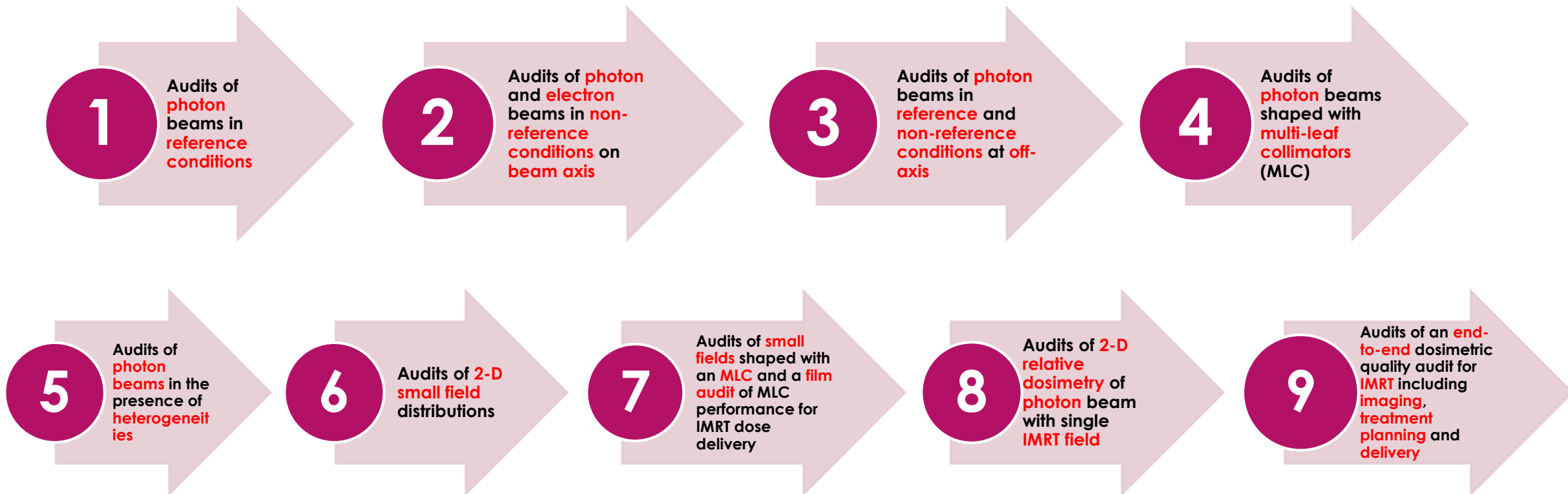


Radiotherapy Audit



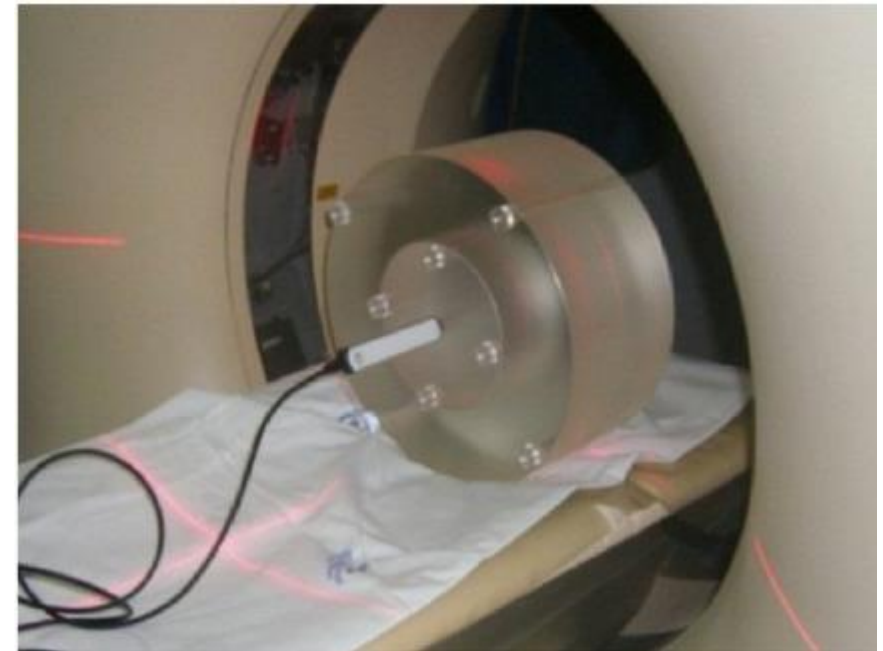


Steps in RT Dosimetry Audit





Diagnostic Radiology Audit





Diagnostic Radiology Audit

Audit Procedure

- ▶ Entrance Briefing
- ▶ Review
 - ✓ Interviews,
 - ✓ Observations,
 - ✓ Documentation,
 - ✓ **Measurements.**
- ▶ Exit Briefing

The main axes of the review process are:

- ✓ **Quality management procedures and infrastructure,**
- ✓ **Technical procedures.**
- ✓ Patient related procedures,



Nuclear Medicine Audit

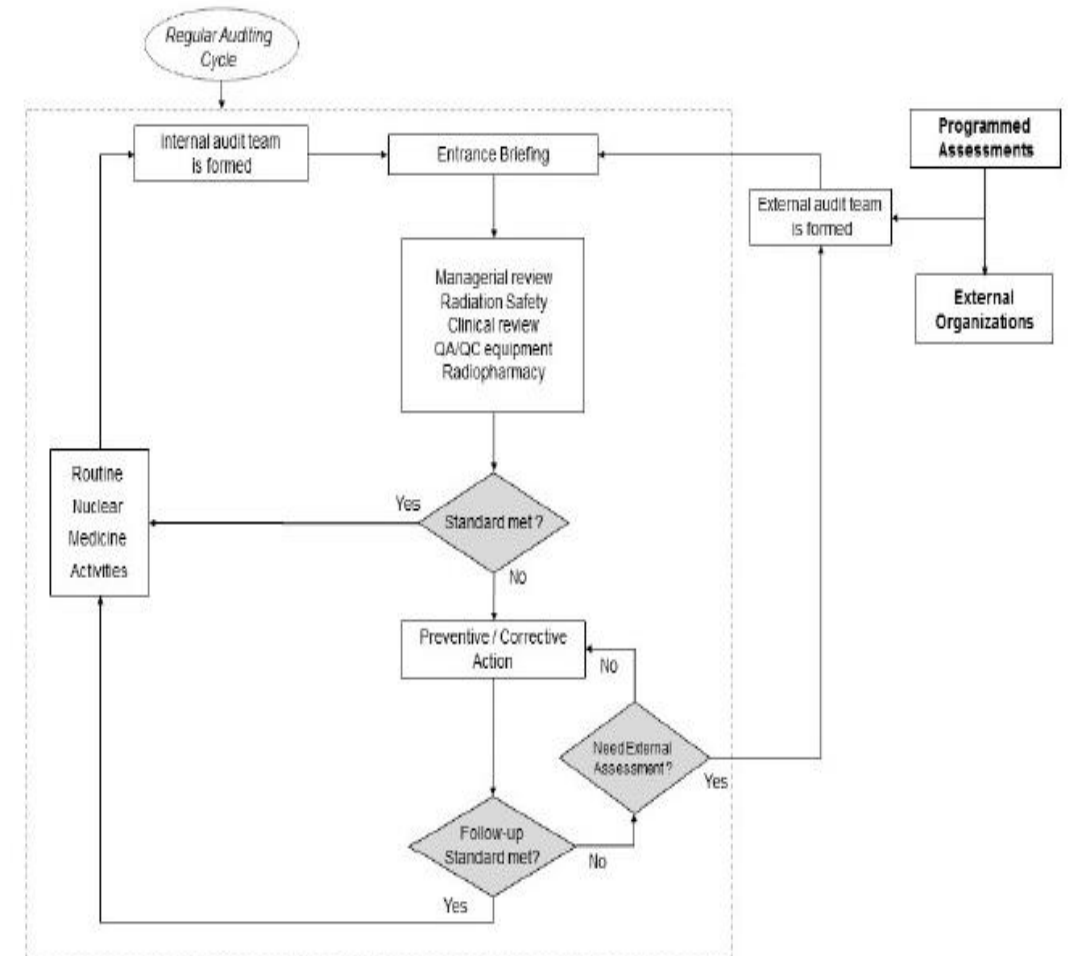




Nuclear Medicine Audit

▶ Audit includes:

- ✓ Human resources development
- ✓ Radiation regulations and safety compliance
- ✓ Evaluation of the QMS
- ✓ QC for imaging equipment
- ✓ Assessment of diagnostic imaging procedures
- ✓ Assessment of general radionuclide therapy
- ✓ Assessment of non-imaging diagnostic procedures
- ✓ Radiopharmacy





Audit Reporting

► Suggested Audit report structure:

- ✓ Objectives of the audit;
- ✓ Brief description of the audit activities;
- ✓ Description of the facility (infrastructure, workload, etc.);
- ✓ Findings and results of the audit (including checklists);
- ✓ Conclusions;
- ✓ Recommendations to improve on shortcomings (to the institution or other agencies);
- ✓ Annexes.



Physics Audits Performed in Ghana

Radiotherapy



Team of MP auditors at SGMC and KBTH RT centre



Physics Audits Performed in Ghana

Diagnostic Radiology



Audit of planar X-ray and CT systems



Summary

- ▶ **Clinical Audit** is a necessity in radiation medicine to:
 - ✓ improve the quality of **patient care**;
 - ✓ promote the effective **use of resources**;
 - ✓ enhance the provision and **organization of clinical services**;
 - ✓ further professional **education and training**

Thank You