



Catalan Clinical Audit
Network for Quality Improvement
in Radiotherapy

QUATRO and B-QUATRO: Commonalities and differences

Clinical Audits in Radiation Oncology: Training for Auditors and Auditees

Day 1 (10/06/2025)

Aude Vaandering



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CAT·ClinART

Clinical audits

“Clinical audit is a method of evaluating practices that measures the **gaps** between **actual observed practice** and the expected or recommended practice (such as best practice guidelines), based on evaluation criteria.”



Clinical audits

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Gaps = infrastructural, organizational or clinical practice that are in need of improvement

By addressing these identified gaps, departments will improve their practice → **quality improvement**





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Clinical audits

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Clinical auditors = professional who is trained to systematically evaluate practice versus standards





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PEER REVIEWED Clinical audits

“Clinical audit is a method of evaluating practices that measures the **gaps** between **actual observed practice** and the **expected or recommended practice** ((such as best practice guidelines), based on evaluation criteria.”



Clinical auditors = professional who is trained to systematically evaluate practice versus standards **and who is professionally active in the field he/she is auditing**



PEER REVIEWED Clinical audits

“Clinical audit is a method of evaluating practices that measures the gaps between **actual observed practice** and the expected or recommended practice (such as best practice guidelines), based on evaluation criteria.”

Reference manual/audit manual= structured guide that outlines the procedures, standards, tools, and responsibilities involved in conducting an audit



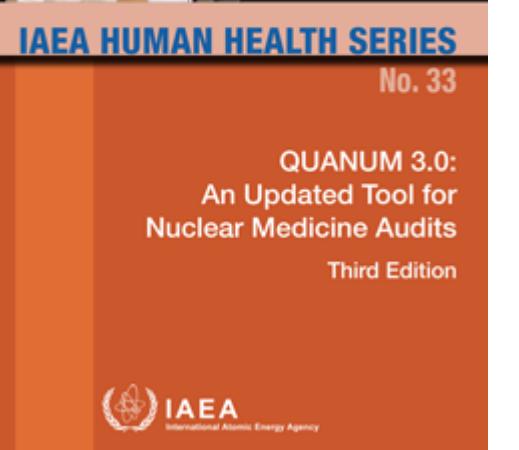
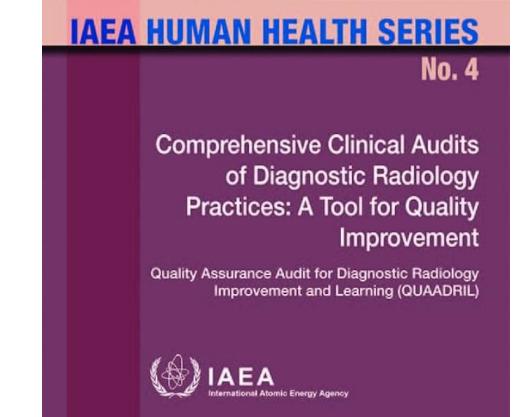
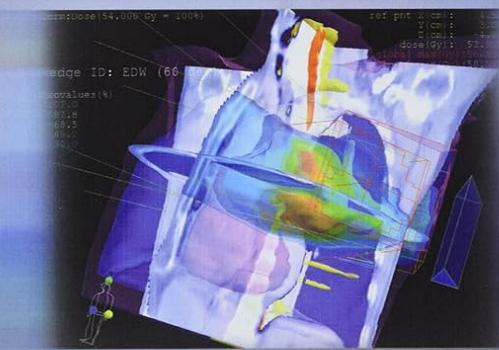
QUATRO methodology and manual

Comprehensive Audits of Radiotherapy Practices: A Tool for Quality Improvement"

- Published by the **International Atomic Energy Agency (IAEA)** in 2007, it serves as a guide for conducting peer-reviewed clinical audits in **radiotherapy** departments.
- Complete content:**
 - Audit methodology
 - Evaluation criteria (checklist and templates)
- Comprehensive:**
 - it covers patient and equipment related procedures, radioprotection, CPD and training
 - Audit carried out by a **multidisciplinary** team of auditors (Radiation oncologist (RO), Medical Physicist (MP) and radiation therapist (RTT))
- International** and adaptable to various economic contexts
 - 101 QUATRO audits worldwide in 51 countries (including 14 re-audits)

Comprehensive Audits of Radiotherapy Practices: A Tool for Quality Improvement

Quality Assurance Team for Radiation Oncology (QUATRO)



Radiology

Nuclear medicine



Quality criteria checklist and templates

CHECKLIST 2. CLINICAL RECORDS

Items to be reviewed by auditors

Processes and practices: 1–Poor, 2–Major improvement, 3–Minor improvement, 4–Appropriate

1 2 3 4

Filing system

Clinical history

Physical examination

Comment on the status of clinical records:

Overall assessment: 1–Poor, 2–Major improvement, 3–Minor improvement, 4–Appropriate

1 2 3 4

Overall assessment

Distribution restricted

REPORT ON QUATRO AUDIT MISSION
TO
[add name of centre]
IN
[add in the country]

Project number: [add project number]

Date: [start and end date]

QUATRO TEAM:

[name] Medical Physicist
[name] Radiation Oncologist
[name] Radiation Therapist (RTT)
[other as applicable]

[Enter the team leader in (...) after the name]

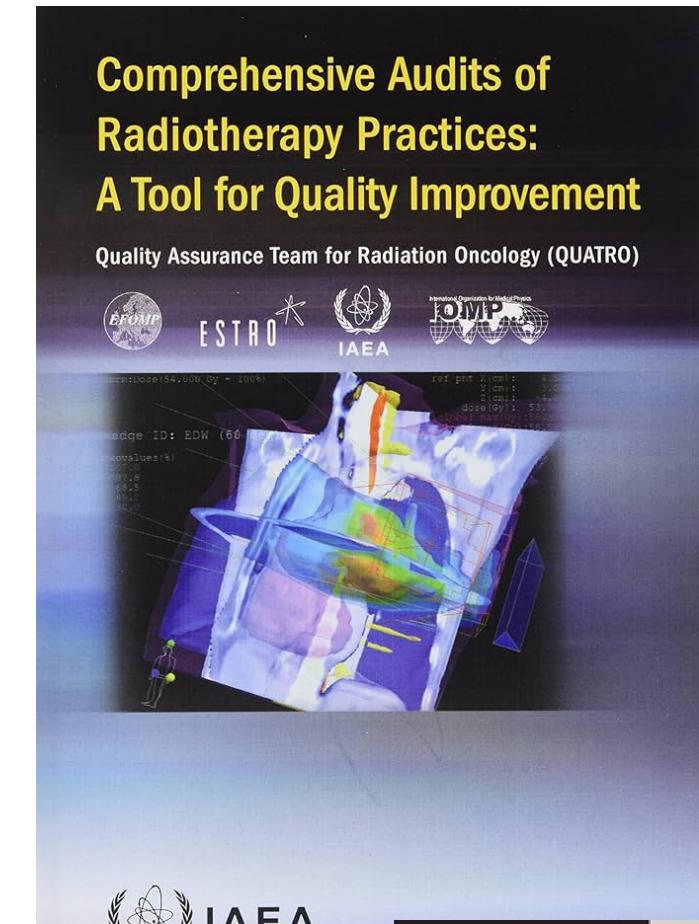
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- Reviewed in 2020 (and includes excerpts from BQUATRO)**



Radiology

Nuclear medicine

Belgium: from QUATRO to B-QUATRO

Context

- 2001: The 97/43 Euratom directive is transposed into Belgian law
- 2010: National Cancer plan: includes a budget for quality improvement initiatives in radiotherapy :
 - National dosimetric audits (BELdART);
 - National platform for the analysis of adverse events;
 - Financing of an FTE quality manager/radiotherapy department



Condition: Audits need to be organized in all radiotherapy departments

Belgium: from QUATRO to B-QUATRO

Context

- 2001: The 97/43 Euratom directive is transposed into Belgian law
- 2010: National Cancer plan: includes a budget for quality improvement initiatives in radiotherapy :
 - National dosimetric audits (BELdART);
 - National platform for the analysis of adverse events;
 - Financing of an FTE quality manager/radiotherapy department
- In 2010, decision to use the IAEA QUATRO audit methodology
 - Comprehensive clinical audits
 - Focus on patient and equipment related procedures, radioprotection, CPD and training
 - Peer reviewed audits
 - Multidisciplinary auditor team composed of a RO, MPE and RTT
 - Audit based on observation, review of procedures and documentation, review of files, interviews, etc.
 - Gives rise to reports describing recommendations
 - Well known audit methodology



Condition: Audits need to be organized in all radiotherapy departments

Why?



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Belgium: from QUATRO to B-QUATRO

Context



- 2011-2015: QUATRO was used to audit **all Belgian RT departments**
- Contrary to QUATRO
 - Exclusion of brachytherapy
 - Exclusion of LINAC/dosimetric measurements (→ BELdART*)
 - 3 days of audit per department (versus 5 days for QUATRO audits)



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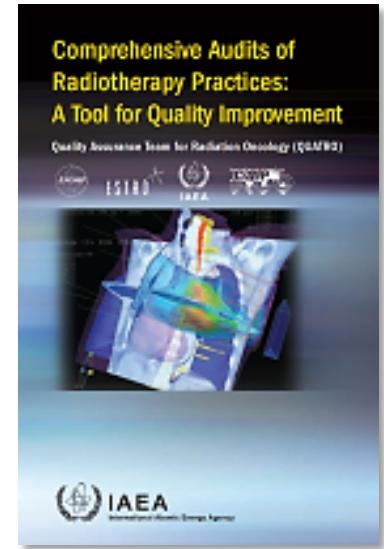
Belgium: from QUATRO to B-QUATRO

Context

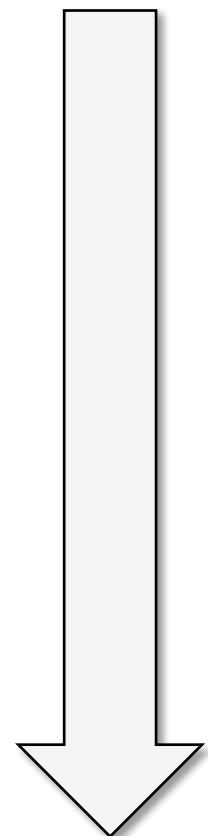
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- **2015:** *Can we “improve/adapt” QUATRO?*



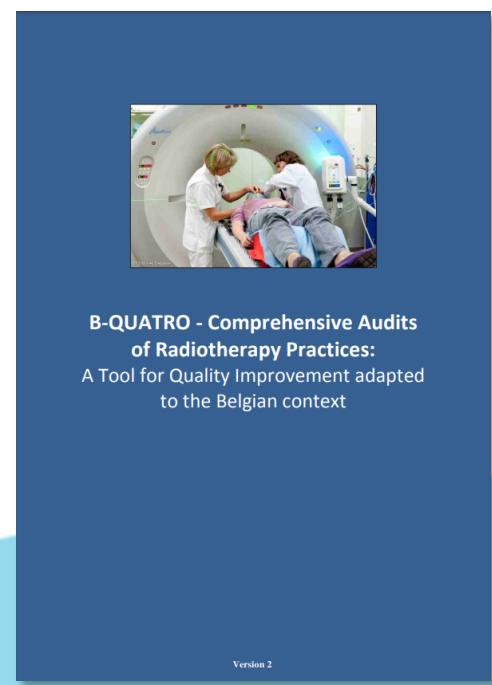
Belgium: from QUATRO to B-QUATRO



QUATRO: Comprehensive peer review clinical audits (2011-2015)



- Integration of new technologies
 - SGRT, 4D planning and treatments, stereotactic treatments...
- Belgian contextualization
 - legislation, satellite sites...
- Chapter focussing on RT quality management (QM)
 - Additional quality criteria and checklists focussing on QM*
- Rewording of the quality criteria and reformatting of the audit checklist
- Development of data analysis tool
 - Radar plots



B-QUATRO: Belgian - Comprehensive peer review clinical audits

<https://afcn.fgov.be/fr/system/files/2020-01-23-b-quattro2.6vcomp.pdf>

Belgium: from QUATRO to B-QUATRO

Context



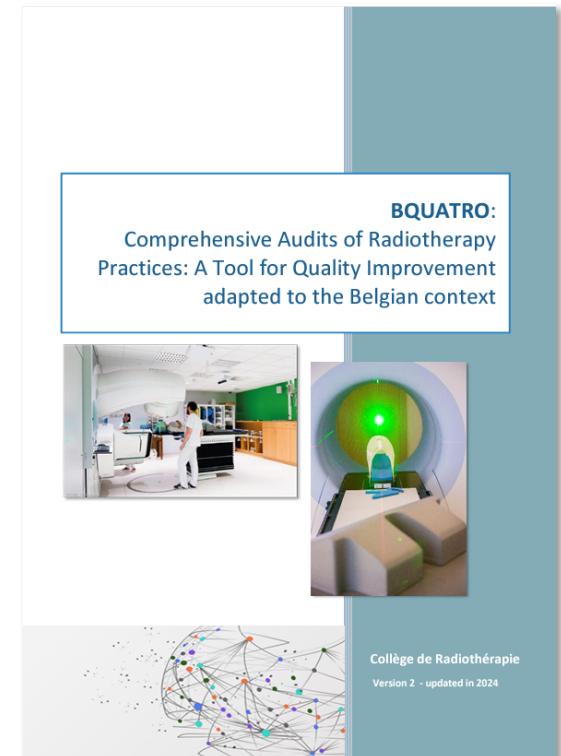
- **2017-2023: B-QUATRO was used to audit all Belgian RT departments**
 - Exclusion of brachytherapy 
 - Exclusion of LINAC/dosimetric measurements (→ BELdART*) 
 - 2½- 3½ audit days/department 
 - Inclusion of the quality managers within the audit team 

Belgium: from QUATRO to B-QUATRO

Context



- 2017-2023: B-QUATRO was used to audit all Belgian RT departments
 - Exclusion of brachytherapy 
 - Exclusion of LINAC/dosimetric measurements (→ BELdART*) 
 - 2½- 3½ audit days/department 
 - Inclusion of the quality managers within the audit team 
- 2023 Review of the B-QUATRO (BQUATRO I → BQUATRO II)
- 2024-2029: Third cycle of audit using B-QUATRO II
 - Exclusion of brachytherapy 
 - Exclusion of LINAC/dosimetric measurements (→ BELdART*) 
 - 3-4 audit days/department 



QUATRO versus BQUATRO?

Feature	QUATRO (2020 reviewed version)	BQUATRO
Origin	Developed by the IAEA (International Atomic Energy Agency)	Belgian adaptation of QUATRO
Scope	International, adaptable to various economic contexts	National, tailored to the Belgian/Western European healthcare system
Focus	Infrastructure and human resources (staff) Patient and equipment procedures (INCLUDING dosimetric measurements) Training and continuous professional education Radioprotection Touches on risk management, procedures and communication	Infrastructure and human resources (staff) Patient and equipment procedures (EXCLUDING dosimetric measurements) Training (limited) and continuous professional education <i>Radioprotection (limited)</i> Whole chapter (11 checklists) on quality and risk management
Auditor team	RO, MP and RTT	RO, MP, RTT and QM
Audit length	5 days	3-4 days
Quality criteria evaluation system	4 point grading system per quality criteria (ex: <i>none of the time, some of the time, most of the time, all the time</i>) Overall assessment base on 4 criteria (<i>Poor, major improvement, minor improvement, Appropriate</i>)	3 point grading system per quality criteria (Yes, in progress, no) Overall assessment base on criteria (<i>Non-compliant, Partially compliant, Compliant</i>)



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Any Questions?