International Practice Accreditation

Program endorsed and supported by

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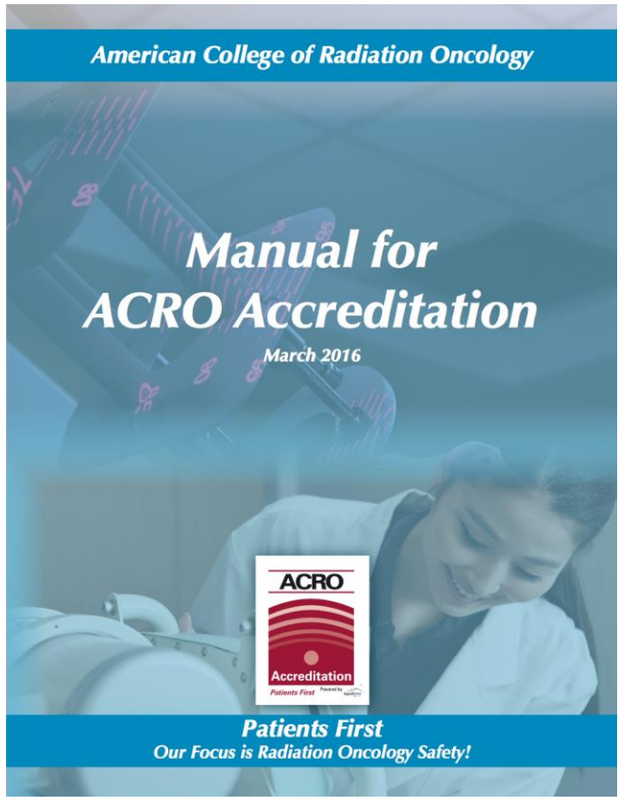
Short History

- Created in 2004 by ESTRO, independent since 2009
- Dosimetry Laboratory (IGR): Equal project
- Full postal dosimetry audits (like Iroc, MD Anderson)
- Clinical Trial QA Management offices in Brussels (Belgium)
- IT department in Brussels (Belgium)
- US Branch opened in Cambridge, MA (US) 2011
- 12 employees + Physicist & Physician Experts worldwide

Certifications

- ANSM Accredited (2004) COFRAC (2009)
- ISO certified 2009 (Lab) 2010 (Clinical Trial)
- ACRO Agreement to support US Accreditation 2012
- Secured HIPAA compliant servers in EU and US
- Intercomparison with IAEA with IGR Physics Dept
- **ACRO Endorsement for International Accreditation 2014**



- Started in 1995 by academic, hospital-based and private practice-based radiation oncologists.
- Large panel of experts, organ specific, disease site team leaders
- Hundreds of Accreditation each year
- Limited to the USA
- Collaboration with Equal-Estro since 2011 (ISO certified, web-based platform)

- Expert For Quality Control of full chain of treatment

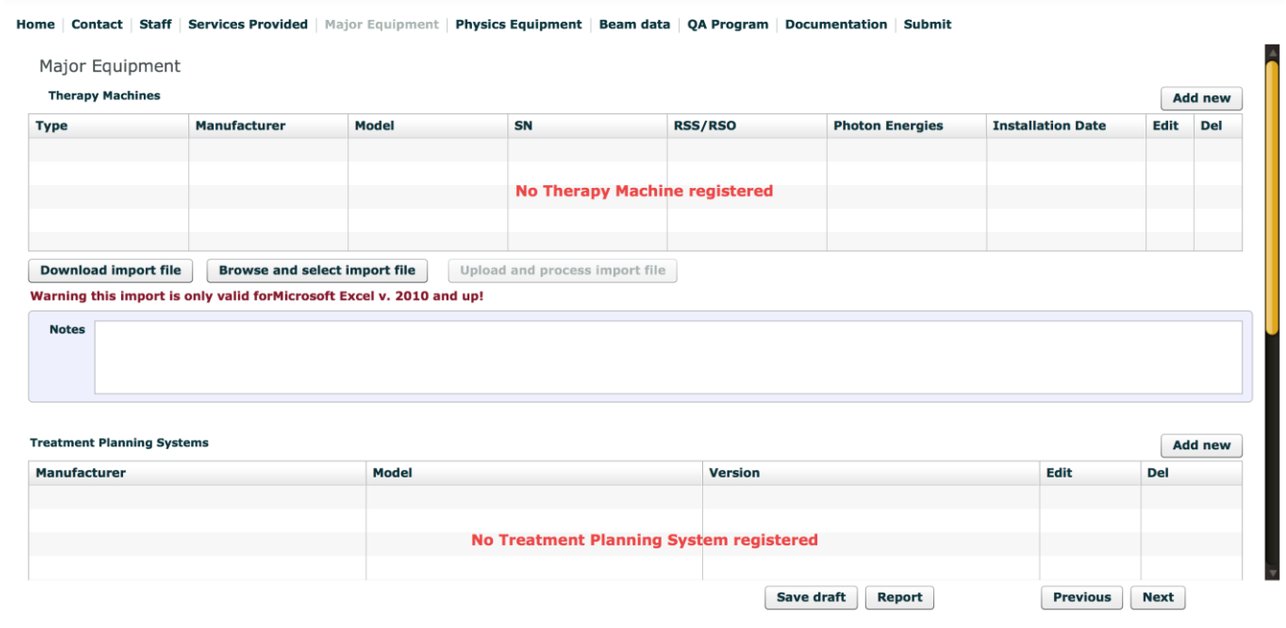
- Dosimetry Audits of Treatment Machines
- Review the QUALITY of patients treatments (contouring, doses and OTT) by International Experts - Web-based
- Major Deviation found in 25% of treatments
- What to do?

- **FOCUS ON THE PATIENT**

- Dosimetry Audits of Treatment Machines &
- Review of Internal QA Procedures (Physics) On-site
- Review the QUALITY of Patients Treatments (contouring, doses and OTT) by International Experts. Web-based
- Review the Internal Quality Processes based on ACRO Accreditation Protocols
- Adapted to National Constraints

Physics QA Procedure and Patient Review

- Log-in to Equal Website
- Fill-in the survey
- Send Patient list
- Upload patient charts
- Set-up site visit
- Receive Certificate



Value of International Accreditation

- International **Recognition** (Equal-Estro & ACRO)
- **Patient Safety** reinforced with Quality Checks on Equipment and Patients Treatments
- The whole chain of treatment is VALIDATED
- **Quality Indicator (measure to improve)**
- Educational extension with the **CQI**
- Patients request for external/independent review of their treatment plans

Continuous Quality Improvement (CQI)

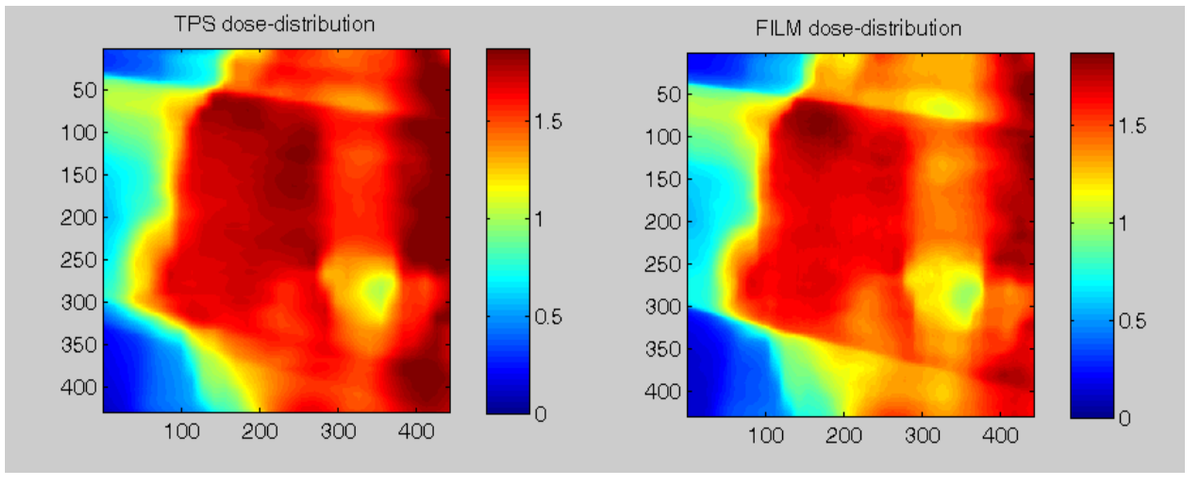
- Routine review of 10% of all patients
- Mainly retrospective reviews (cost)
- Review before treatment is also possible
- Database accessible for research
- Participation in Patient Registries (Alexandria)
- Int Accreditation + CQi = Quality Label

Dosimetry test for IMRT and Tomotherapy

This audit employs radiochromic films and TLD capsules.

Measurements are performed using plastic phantoms (EasyCube®) and the two types of dosimeters are irradiated separately

TLDs are designed to measure the reference output of the linac, while the films are designed to control the dose distribution during a dummy treatment applied to the phantom.



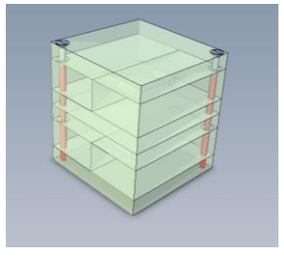
Measured vales are compared to planned ones using TPS dicom data, via dedicated software.

This test is currently running in European countries.

Dosimetry test for Cyberknife systems

A special designed plastic cube that can be placed in the head of the anthropomorphic phantom which is usually present in each Cyberknife center is used for the tests.

Films and TLD-tubes are inserted in this cube are to be irradiated simultaneously during a treatment applied to the phantom.

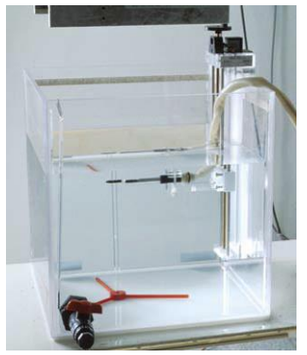


This test is currently under validation process.

Dosimetry test for standard therapy beams

photon and electron beams are tested using the *TLD method*

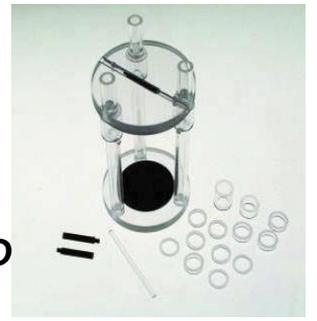
dosimeters are presented in the form of small polyethylene capsules containing LiF powder



Measurements are performed in reference and non-reference conditions using a water phantom.

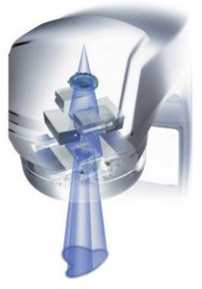
TLDs are placed in the water using special designed holder for each type of beam.

For photons, a IAEA type holder is employed that allows two different position for the positioning of the TLD.
For electrons beams, an EqualEstro type holder is used allowing the TLD positioning with 1mm step in depth.



Up to 11 TLDs are irradiated in photon beams and up to 5 TLDs in electron beams.

Tests performed for photon beams allow to check :
- **reference beam output**
- **depth dose data**
- **collimator factor**
- **wedge transmission factor**



For electron beams tests allow to check :
- **reference beam output and**
- **collimator factor**

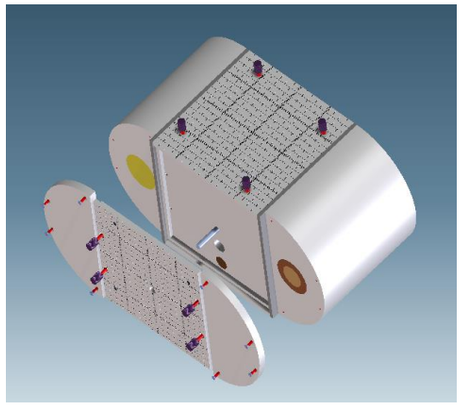
Acceptance criteria are based on the difference between the planned and measured dose.

$$\delta_{Dose} = (D_{TPS}-D_m)/D_{TPS}*100\ (\%)$$

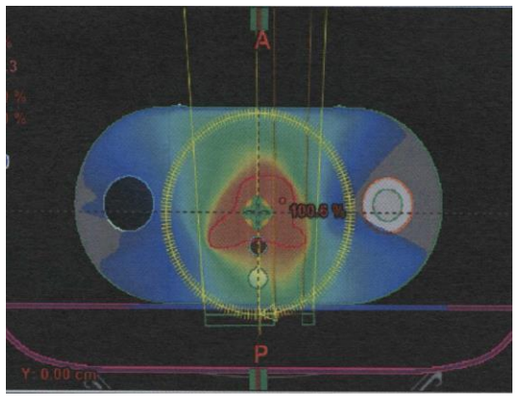
Equal-Estro Laboratory is accredited by the French government to perform external audits of radiotherapy systems in France.

Dosimetry test for arc-therapy

TLD-tubes are employed for dose measurements in static mode as well as in dynamic mode, using a EasyCube® based adapted phantom



Up to five dosimeters are irradiated separately, in the plastic phantom that contains inhomogeneities mimicking bone tissue, lung tissue and air.

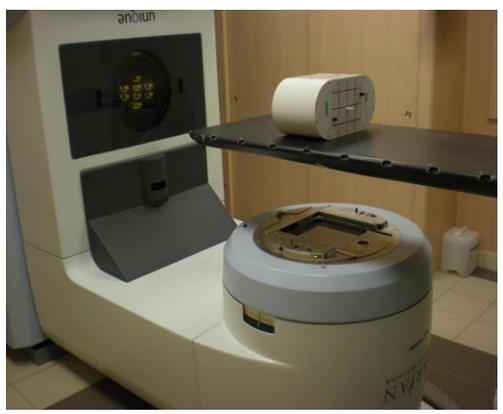


2 TLDs are irradiated in static mode:

- **placed on the beam axis**
- **10cmx10cm field**
- **10 cm depth**

3 TLDs are irradiated in dynamic mode:

- **one entire arc**
- **two opposite half-arcs**
- **one arc with exclusions**



Point dose measurements are compared to TPS estimated values.

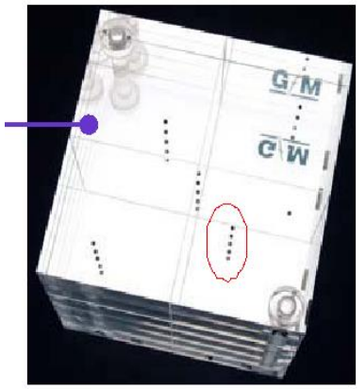
$$\delta_{Dose} = (D_{TPS}-D_m)/D_{TPS}*100\ (\%)$$

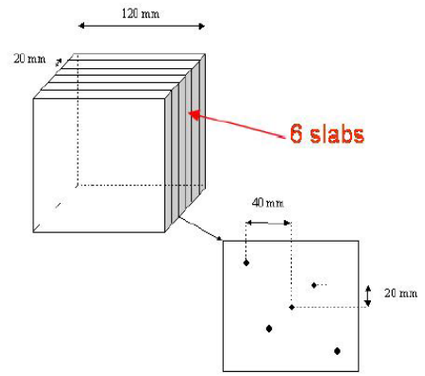
Audits for brachytherapy units

The audits for BT units are divided in two parts:

brachytherapy geometric reconstruction

The preliminary step of the brachytherapy audit consists in a geometric reconstruction test. It uses a specially designed plastic phantom that contains a number of metallic markers which are placed in well-defined positions.

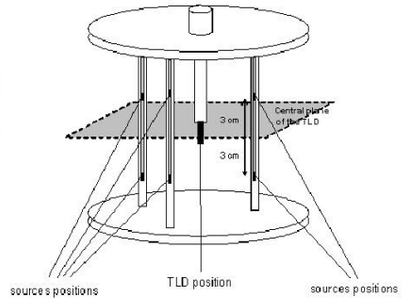


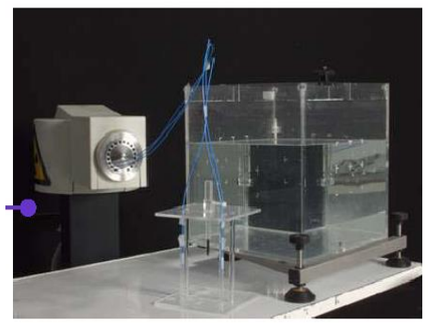


The aim of the test is to compare the real distances between markers to that measured by the audited center.

brachytherapy dose measurements

This second step of the brachytherapy audi is only allowed once the first step is passec successfully. The dosimetry test is designed for 192-Ir HDR and PDR sources.





Dose measurements are performed in water, using an appropriate holder that allows positioning applicators around the TLD in a triangular configuration.

The results are expressed in term of deviation between the dose measured by Equal-Estro Laboratory and the planned dose as stated by the audited center.

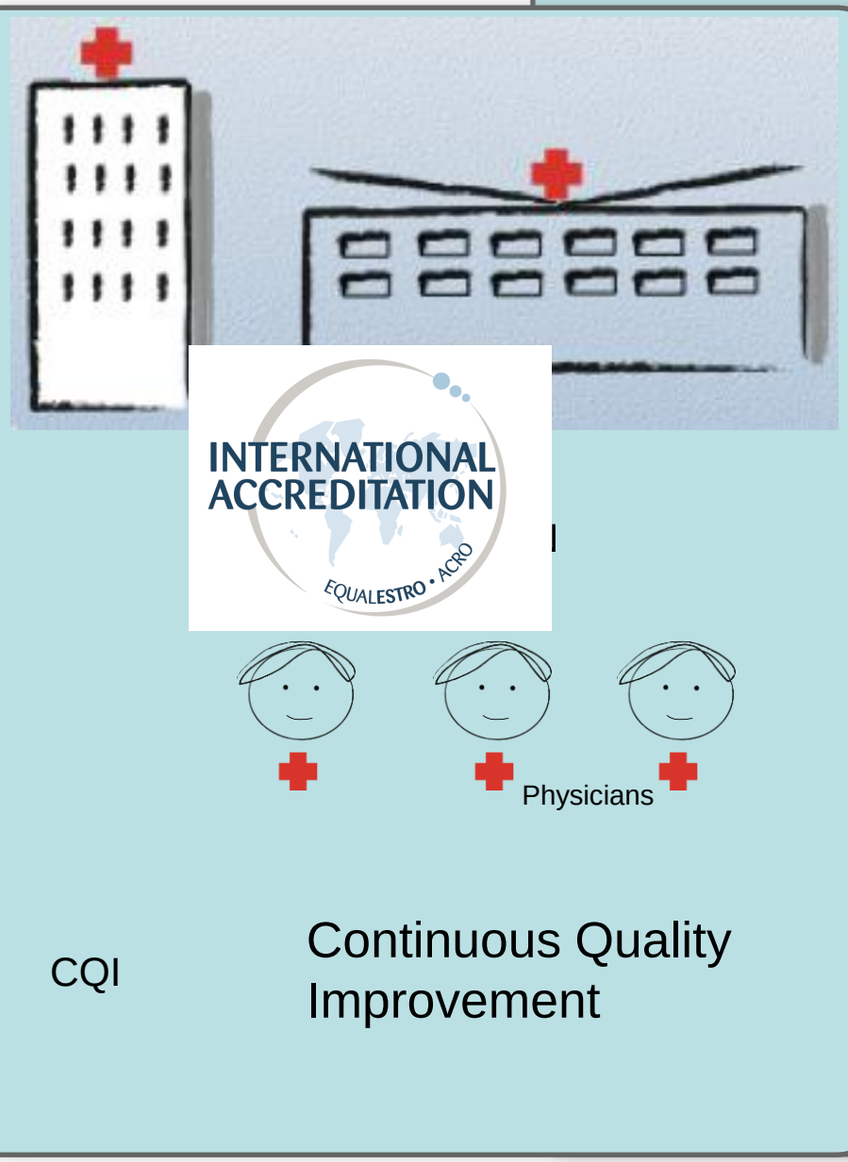
The brachytest is currently running in most European countries.

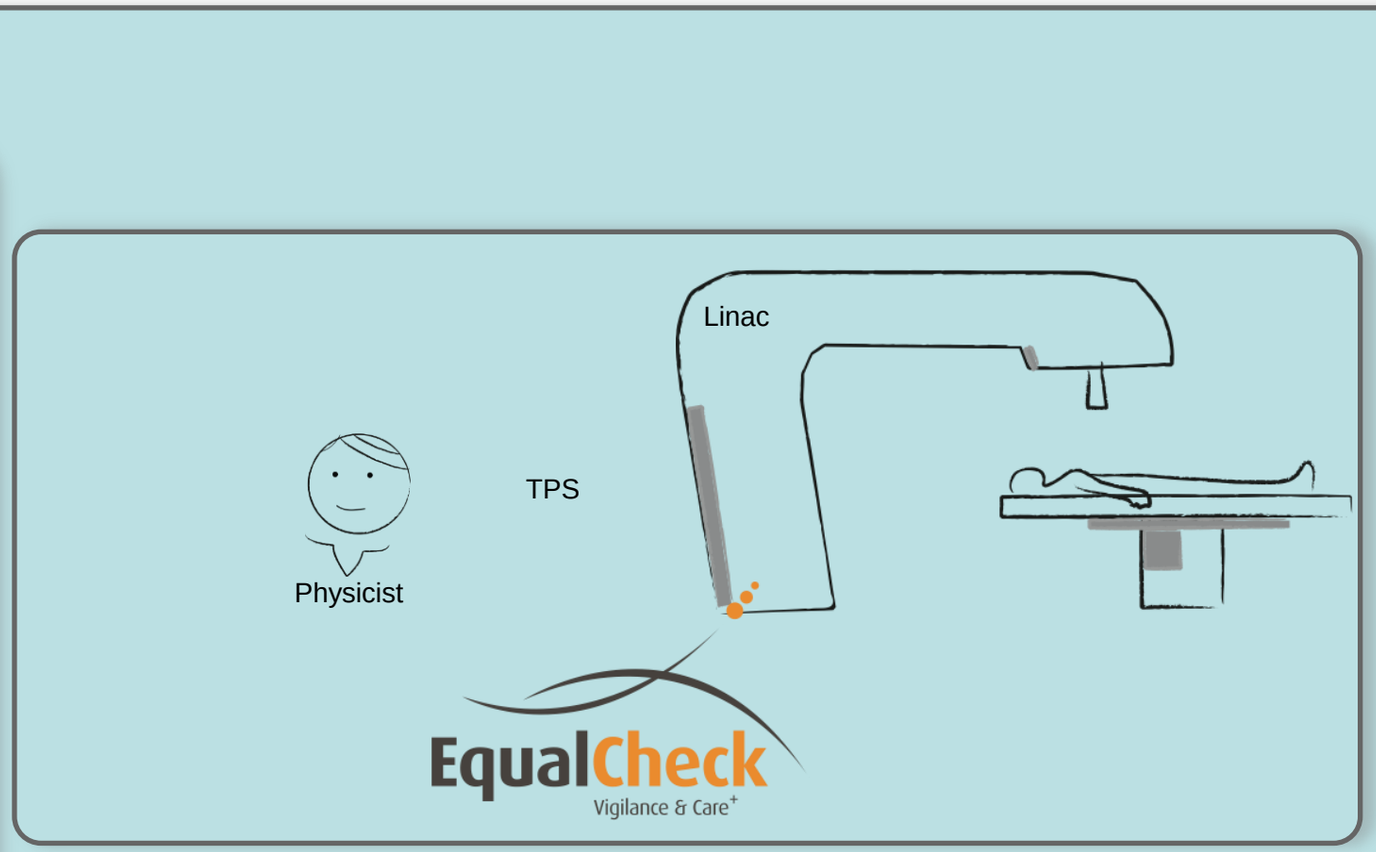
THANK YOU

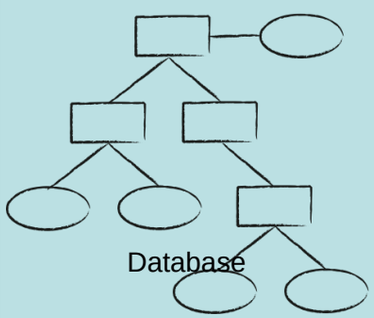
Jean-Xavier Hallet

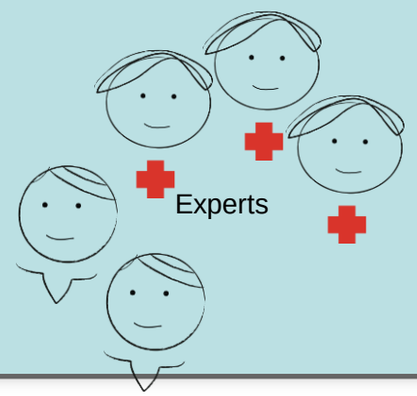
Patient SAFETY FIRST

QualityLabel









PATIENTS ACCESS to external review of their treatment