

# PQI and Individual Projects: The Diagnostic Imaging Physicist

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# Outline

- Introduction
- Project Types
- Individual Project Ideas
- Societal Based Project
- Conclusion

# Introduction

- Practice Quality Improvement (PQI) is Part IV of the ABR MOC program
- Although the goal is obvious, the specifics are less obvious for physicists.
- For Physicians a primary ingredient would relate to Peer Review

# Introduction

- For Physicists Peer Review can be an ingredient, but from a different point of view.
- One question relates to the term “Practice.”
- Quality is one of the mainstays of a physicist's duties, but there is always room for improvement
- PQI is a process

# PQI Process

- Basic idea is a continuous process of improvement
- If first project ends sooner, start another
- In actuality, physicists are performing PQI related duties continuously.
- Main difference is formalization of project and quantification with a metric

# Project Basics

# ABR Guidelines

- Project relevant to patient care
- Project relevant to diplomate's practice
- Project must have identifiable metrics and/or measurable endpoints
- Project must include an action plan to address plans for improvement and perform new measurements to assess progress and/or improvement

# Areas for Projects

- Five General Areas for Projects have been established
  1. Safety for patients, employees, and the public
  2. Accuracy of analyses and calculations
  3. Report Turnaround times and communication issues
  4. Practice Guidelines and Standards
  5. Surveys

# Projects

- Type I
  - Individuals, practice groups, departments, institutions, or health care systems
- Do not require qualification by The ABR
- Documented by Diplomate as to participation with an **Annual Update and attestation through on-line Personal Data Base**
- Subject to audit

# “Individual” Projects

- A project may be within the Department, so that this is a group effort. This is acceptable, have to show participation as an individual
- A project may involve a Practice Group which is similar to a Department
- So individual can be part of a group project

# Practices

- For Imaging Physicists somewhat complicated
- Academic or Community Hospital Staff
  - May be part of a group or may be an individual
- Consultant
  - Practice will cover many different institutions
  - More individualized
- Different Modalities
  - Nuclear, Diagnostic Radiology, MRI
  - Each has unique concerns

# Examples

- Look at some examples of possibilities for Individual Projects
- Some of these are based on the White Paper in Medical Physics  
The American Board of Radiology perspective on maintenance of certification: Part IV: Practice Quality improvement in radiologic physics. G. Donald Frey, Geoffrey S. Ibbott, Richard L. Morin, Bhudatt R. Paliwal, Stephen R. Thomas, and Jennifer Bosma. Med. Phys. 34, 4158 (2007)
- Others are based on personal ideas
- Examples are Imaging based but the ideas are generally applicable to Therapy physicists
- These are being offered as guides, only!!!!!!!

# Examples

- There are probably many areas in your practice that you have thought would be good to monitor.
- PQI is a good impetus to do such projects.
- In a group practice within a Radiology Department there are good projects on dose, techniques, etc.  
  
could involve radiology residents, and radiologists as a group practice.
- For consultants, could involve a particular site, or apply to all clients in general.

# Projects

- There may be certain things that you are monitoring now
- Formalize this within the PQI framework.
- Identify the Project
- Identify the metric
- Summarize data to date, or make an initial measure
- Monitor further
- Compare

# Examples for Individuals -- Safety

- Radiation Safety is a big Issue
- CT
  - Protocols are preset for a given technique, but problems occur at high and low body habitus.
  - Choose a dominant technique like abdomen-pelvis, or chest
  - Monitor technique in cases of low and high body habitus.
    - (Choose a period of time to check)
    - Get residents and techs to help find cases.
  - Look at technique actually used (which would relate to Patient Exposure). Compare to expected (technique), or reasonable set up.
  - Measure % of cases that difficulties are found. Monitor noise and dose.
  - Initiate corrective measures, (update technique chart, technologist education)
  - Recheck

## Examples for Individuals -- Safety

- Image Quality at the lowest dose is Important, also
- As a variation of the previous slide, a good group project
  - Monitor image quality as a function of CT technique.
  - Choose a dominant technique like abdomen-pelvis, or chest
  - Get residents and techs help find cases.
  - Evaluate Image Quality
  - Measure % of cases that difficulties are found. Monitor noise and dose.
  - Initiate corrective measures, (update technique chart, technologist education)
  - Recheck
- Note: Consultant may be doing this with a site.

## Safety -- CT (Consultant)

- Verify techniques at sites covered for standard exams
  - Compare doses to Databases (ACR)
  - Monitor changes in techniques. Compare techniques over some previous time period based on information available
  - Quantify change
  - Determine if additional assistance is needed
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- Could use data and determine distribution of dose among sites
  - Summarize with appropriate de-identification.
  - Could be useful as part of a regional or national database.

# Safety -- Angiography

- Program for monitoring high patient exposures
- Program for capturing necessary data (fluoro time, radiation exposure measure as output from the unit)
- Monitor on a periodic basis.
- Note percent of time these values are recorded and recorded accurately
- Choose subset and spot check accuracy (%)
- Institute Improvements
- Remeasure

## Safety – Angiography (Personnel)

- Program for monitoring High Personnel exposures
- This is part of Radiation Safety Committee
- However, can participate in trying to reduce personnel exposure
- Monitor exposure values
- Institute educational programs, technical solutions
- Remeasure

# Safety -- MRI

- Safety guides are in place. Perhaps there are still issues. Check limited access restrictions and safety program.
- Verify that access to Magnet is controlled after hours and restrictions for environmental services in place.
- Monitor break downs in process.
- Monitor number of incidents.
- Modify guidelines as needed.
- Recheck

# Safety -- Nuclear Medicine

- Radiation Badge Monitoring of Personnel
  - Although this is part of Radiation Safety Committee, look to reduce levels
  - Monitor badge readings of individuals
  - Determine the average within the group (cardiac related versus general)
  - Assist in improvements
  - Remeasure
- Could apply separately to PET.

# Accuracy and Analysis of Results

- PET -- SUV
- Monitor accuracy of SUV calibration on a regular basis (e.g. quarterly)
  - Calibrations are performed on a regular basis but may not be verified
- Set a metric for range (+/- 5% ???)
- Assist with means to improve
- Remeasure
  
- Good possibility for a consultant to monitor variation in an area (Compare values and distribution). Try to reduce variation as patients are not static.

# Personnel Safety

- Film Badge Return Promptness
- Although this may be part of the Radiation Safety Committee, one could monitor the % of time exposed badges from individuals are on time for the period (monthly or quarterly)
- One could examine the results by areas and work to improve compliance
- Remeasure

# Report Turnaround Times, Communication Issues

- Good project for the Consultant Physicist
- Measure time between survey date and report sent
- Analyze for any inefficiencies, develop improvement
- Remeasure
  
- This can be useful in a Hospital Setting, also.
- Could modify or add to the project the evaluation of length of time for issues to be addressed by service.

# Practice Guidelines and Standards for Equipment Checks

- Good model for individual and Societal
- A number of standards available
  - ACR
  - AAPM
  - ACMP
- Compare how your work fits the standard.
- Good model for acquiring national data
- Good model for determining frequency of certain checks
- National survey?
- Such standards and TG reports are ideal for Therapy physicists.

# Surveys

- Satisfaction Surveys (administration, physicians)
  - Accessibility
  - Responsiveness
  - Report timeliness
  - Satisfaction
- Use survey to implement an improvement plan
- Institute new plan, remeasure
- Individual, Group, or National

# Peer Review

- Could participate in a Peer Review of practice individually (someone could look at the overall program)
  - On site or off site
- Would produce recommendations
- Provide impetus for correction/follow up
  
- A system like this was thought of in the early stages of PQI, which morphed into the Therapy Societal PQI.

# Teaching

- Efforts under way to formalize a document for use for teaching evaluation. (Educator's Subcommittee)
- Compare evaluations over a period and note areas for improvement
- Make changes
- Look at evaluations again over a period of time and compare to previous.
- Obviously each class is unique but are looking for trends.
- Individual can do their own evaluation form.

# Society PQI for Diagnostic

- Details are being worked out
- Will be similar to the Therapy Societal Project
- Main goal is applicability to all areas of Diagnostic Imaging

# Summary

- Many possibilities
- Examples presented are personal thoughts
- Work is being performed already
- **Need to formalize process and follow up**
- Benefits to field of imaging and personal satisfaction
- Most important -- start a project and follow up