TG 230 – MPPG 3:
The Development, Implementation, Use and Maintenance of Safety Checklists

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Safety Checklist - Utilization

1. We use Checklists effectively
2. We use Checklists ineffectively
3. We do not use checklists in our practice
4. Checklists are a waste of time

Would our field benefit from guidelines on developing safety checklists?

1. Yes
2. No

The Story
Work Group on Prevention of Errors in Radiation Oncology

Using simple and accessible tools

How can we improve safety and quality in our field??

Checklists

Checklists - Background

- Checklists have been extensively validated in non-medical and medical fields for many years, and have proven to be an effective tool in error management and a key instrument in reducing the risk of costly mistakes and improving overall outcomes.

Boeing 2012

Checklists - Background

  - Reducing hospital-acquired infection rates by 70%.

  - Improved compliance with standards of care by 65% and reduced surgical mortality by nearly 50%

- What about *Radiation Oncology, Diagnostic Imaging, Nuclear Medicine* and *Medical Physics*?
Achievable Goals

- Compliance improvement of clinical protocols, procedures and processes
- Reduction of near-misses in critical clinical processes
- Enhancement of communication and team dynamic
- Improve practice standardization
- Streamline workflow

Role of Checklists in Error Management

- Basic memory guide those tasks that are easily forgotten; allowing the team to concentrate on tasks that require full attention (Gawande 2009)
- Checklists function as a supporting interface among individuals, and between individuals and their environment (Patient Safety Primers: Checklists)

Sociocultural Component of Checklists

- The mistake of the “simple checklist” story is in the assumption that a technical solution (checklist) can solve and adaptive (sociocultural) problem.” (Bosk et al. 2009)
Hazard Mitigation Effectiveness

- Forcing functions and Constraints (Interlocks)
- Automation and Computerization
- Simplification & Standardization
- Reminders and Checklists
- Policies and Procedures
- Training and Education

Courtesy of J. Goldwein, Elekta, AB.

Forcing Function

Checklist

- Motivation
- Perception
- Interpretation
- Discipline
- Fatigue
- Distraction
- Compliance
- Mood
- Cooperation
- Etc.

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Drill Bit

Drill Bench
Checklist in Airline Industry

Checklists

+ Crew Resource Management (CRM)

CRM focuses on:
- interpersonal communication,
- leadership, and
- decision making

Checklist in Medical Industry

Checklists

+ Safety Culture

Factors of Safety Culture:
- Commitment of upper level management to safety
- Shared attitudes towards safety and hazards
- Flexible norms and rules to deal with hazardous situations
- Organizational learning

The Organization and Checklists

Pronovost’s - Michigan Keystone ICU experience:
- Summarizing, simplifying and standardizing the process,
- Creating internal social networks with shared sense of mission and mutual reinforcement mechanisms,
- Gathering, measuring and providing feedback on clearly defined outcomes,
- Developing and supporting a Just and Safe Culture

Checklists – What’s Next?

• The first step on developing checklists is to find those areas or processes with the strongest evidence and clinical impact and have the lowest barriers for implementation and utilization (Bosk et al. 2009)
• Poor selection or ambiguity on the checklist goal, role or tasks will most likely lead to failure on the checklist intervention (Gurses et al. 2008)
• The selection process should concentrate on the “killer items” (Dixon-Woods et al. 2011)
Checklist Development and Implementation Process

- Clinical Need and Evidence-Based Best Practices
- Designing Phase: Content and Format Definition
- Validation and Pilot Phase
- Pre-Clinical Implementation: Training
- Outcomes and Performance Evaluation
- Maintenance and Continuous Improvement

Simple versus Complex Environments and Processes

- Single physicist practice with one linac and developing a checklist for setting water tank
- Multidisciplinary group developing a checklist for a specialized procedure
  - Examples: SBRT, SRS, Angiogram, CT Scan, etc.
- Large practice developing a checklist for pre-treatment physics plan check

Gather the Team

- Team approach should be used throughout all the phases of development, implementation and maintenance of a specific checklist

Human Factors Engineering (HFE)

- HFE uses knowledge about human characteristics, both capabilities and limitations that are relevant during any designing process and aims to optimize the interactions among people, machines, procedures, systems and environments
- Checklist design recommendations can be classified into three main areas:
  - Physical Characteristics
  - Content
  - Layout and Format

Atul Gawande’s website Project Check (http://www.projectcheck.org/checklist-for-checklists.html)

Operating Room Crisis Checklist - Brigham and Women’s Hospital - http://www.projectcheck.org/crisis-checklist-templates.html
Same Clinical Process – Different Groups

Emphasize the fact that each practice needs to go through their own implementation and validation process.

Checklists meets their specific needs
Successful Checklists

- Effective checklists support the human thinking and creativity, allows constructive team member interactions, and facilitates a systematic care delivery.
- Effective checklists require a strong organizational and social infrastructure, as well as the application of well-defined human factor engineering concepts for their success.
- Checklists alone cannot do much; checklists in the appropriate organizational environment can definitely be an exceptional safety management tool.

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Is safety culture a fundamental component of safety checklists?

Complex processes and environments

- 20% Yes. Safety Culture provides the foundation for effective safety checklists
- 20% No. Top-down approach is the most effective way to implement checklists

MPPG 3 - Utilization

- 20% 1. I am planning on using the MPPG-3 in my practice
- 20% 2. I am planning on doing my own research on checklists
- 20% 3. I still do not believe in checklists. In fact next time I go camping, I am planning on using the MPPG 3 document to start my fire

MPPG-3 Safety Checklists