

Making Incident Learning Systems Practical and Useful

SAM Educational Symposium AAPM 2015

This session has been designated among the President's choices for exemplary science consistent with the theme of Reinvigorating Scientific Excellence in the Medical Physics Enterprise. As described in the meeting program, that theme is meant to recognize the importance of scientific research to the AAPM mission and to the future of medical physics.

Speakers

- Gary Ezzell
 - Challenges and Previous Experiences
- Brett Miller
 - Henry Ford Hospital System Experience, with Focus On Motivating and Reviewing
- Derek Brown
 - UCSD Experience, with Focus On Implementing Change
- Philip Beron
 - UCLA Experience, with Focus On Developing Metrics and Using RO-ILS

Previous Experiences

- Number of publications about locally-created systems
 - Washington U, Johns Hopkins, U of Washington, USCD, MDACC, ...
 - Ottawa Hospital, Tom Baker CC (Calgary), Princess Margaret (Toronto)
 - UK, Melbourne

Themes from the publications

- Reporting goes up if the system is electronic, accessible, easy to use
 - Wash U: increase of 14x (!)
 - Melbourne: increase of ~2x
 - Ottawa: decrease of 2x (!)
 - Forced to use hospital wide system, customized to RO
 - “...the use of this system is non-intuitive and cumbersome”

Mutic S, et al. Med. Phys. 37 (2010) 5027-5036

Chang GJ, et al. Radiotherapy and Oncology 112 (2014) 199–204

Clark BG, et al. Practical Radiation Oncology (2013) 3, 157–163

How many reports to expect?

- How many of what?
 - Treatment deviations
 - Errors caught before treatment (near-miss)
 - Errors caught at first QA step
 - Scheduling problems, other practice efficiency issues

- U of Washington: 80/month
- Johns Hopkins + Wash U combined: 88/month
- Ottawa: 40/month
- UCSD: 10/month
- Mayo AZ: 18/month
- MDACC: 11/month
- Normalizing to patient load
 - 1/course to 1/50 courses, depending on what is reported

What do you want reported?

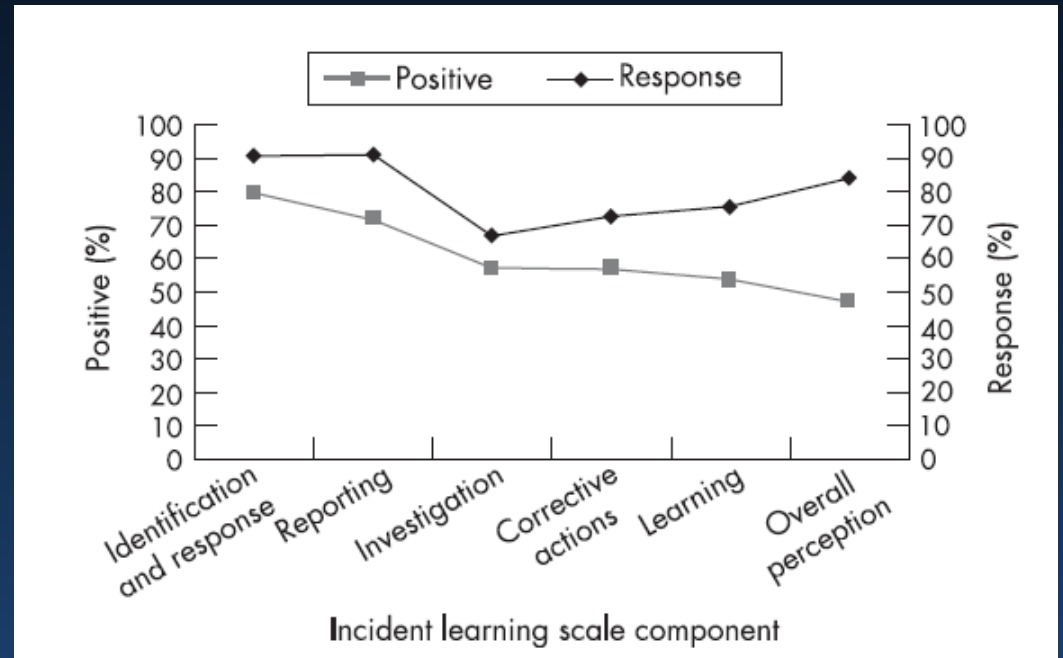
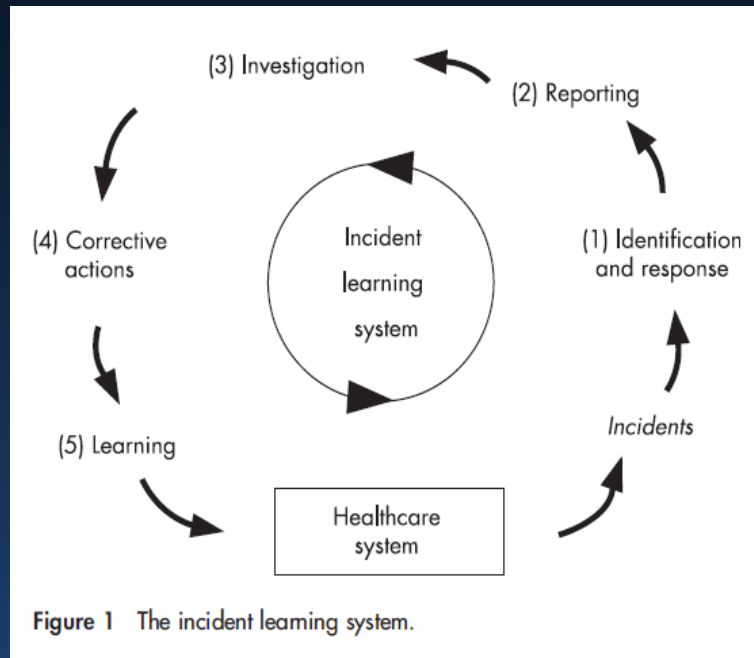
- Best to have a culture that reports all manner of glitches
- Fraction that are actual treatment deviations will be low, 1-2%
- More than 50% will not pertain to safety directly, but to workflow efficiency
 - Fixing those will improve quality and safety

Incentives to reporting

- Access – one click, available on every station
- Non-punitive culture
- Positive rewards
 - “Good catch” recognition
 - Ottawa: More recently, we have recognized individuals with the presentation of a series of **coffee cards** awarded to the individuals logging the most significant reports

Critical: Identifiable results

Survey of staff at Tom Baker Cancer Centre, Calgary, Alberta



Cooke, D.L. et al. Qual Saf Health Care 2007;16:342–348

How are reports reviewed?

- Need an interdepartmental team

- Can review all

- Kusano AS, et al. Practical Radiation Oncology (2014) in press

- Respective supervisors handle what they can and refer complex ones to the group

- Rahn DA et al. Int J Radiation Oncol Biol Phys, Vol. 90, No. 5, pp. 1202e1207, 2014

Questions about the review process

- How to come to the meeting with sufficient information about the event?
- How to rank reports beforehand so the most important are dealt with first?
- What happens to those not discussed?
- When do you do a root cause analysis, and who is involved in that?

How are decisions communicated?

- Review committee members report back to their groups?
- Periodic departmental meetings/newsletters?
- Point is “learning”, not just “reporting”

More questions

- Do you track errors caught by first-line QA?
 - e.g: planning error caught by physics plan check
 - Do you want to know which safety barriers are working and are needed?
- Only those that “get through” or are surprises?
 - e.g: planning error caught when patient is on the table
 - Do you want to know what safety barriers failed?

What statistics are worth keeping?

- Who is reporting? What groups, and how prevalent within the group?
- Where originated? Where caught? Potential severity?
- Can show effect of practice changes (rates up or down, depending)

Let's go national – RO-ILS

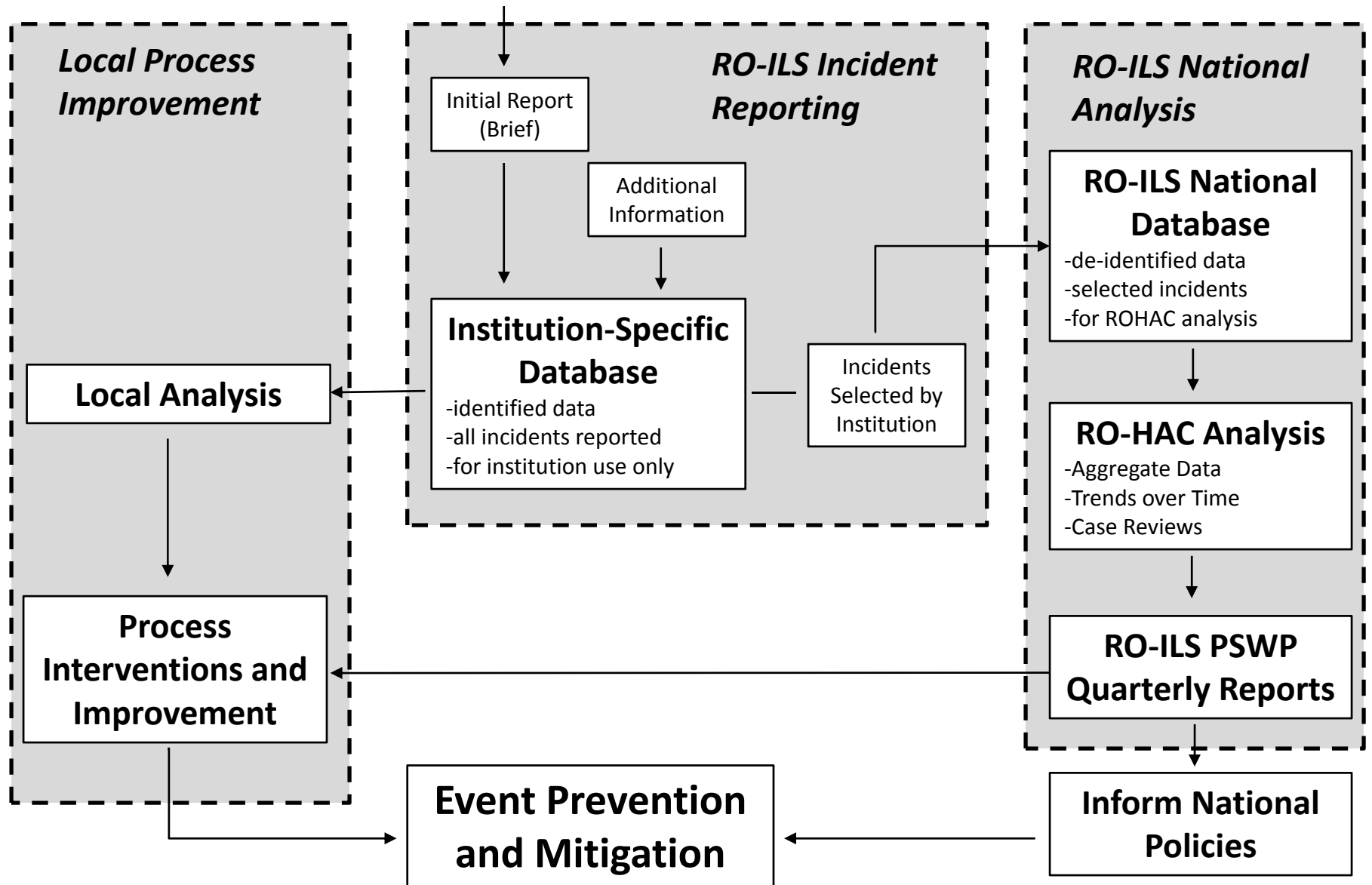
- Sponsored by ASTRO and AAPM; free to use
- Uses the structure of an accredited “Patient Safety Organization” to establish federal protections to reports
- Web-based, no special IT infrastructure
- Can use as the local ILS, choose what to push up to national
- Anonymized reports analyzed by volunteer “Health Advisory Council”, “RO-HAC”

RO-ILS

RADIATION ONCOLOGY
INCIDENT LEARNING SYSTEM

Sponsored by ASTRO and AAPM

Safety Incidents



Report includes ...

What is being reported?

Incident that reached the patient: A safety event that reached the patient, with or without harm ▼

* Narrative: (Briefly describe the event that occurred or the unsafe condition, 4000 character limit)

Patient with lung tumor was being treated on the boost. Image guidance was being used, based on bony anatomy. For one fraction, the therapists aligned to one vertebral body inferior to the actual isocenter. This was found after the treatment when the therapists reviewed the images again. ^

How was the event discovered?

Therapists were uncomfortable with the setup and reviewed the kV images after the treatment. ^

Which of the following best characterizes the event or condition? Select all that apply.

- | | |
|--|---|
| <input type="checkbox"/> Desired Procedure Inadvertently Omitted | <input type="checkbox"/> Wrong Treatment Modality |
| <input type="checkbox"/> Wrong Anatomical Treatment Site | <input checked="" type="checkbox"/> Partial geometric miss of target |
| <input type="checkbox"/> Wrong Dose to All or Part of the Tumor or Normal Tissue | <input type="checkbox"/> Total geometric miss of target |
| <input type="checkbox"/> Wrong Laterality | <input type="checkbox"/> Mechanical Failure |
| <input type="checkbox"/> Wrong Patient Treated | <input type="checkbox"/> Not Sure How to Characterize This Event or Condition |
| <input type="checkbox"/> Wrong Procedure Done to the Patient | |

In what workflow step was the event first discovered?

- Patient Assessment
 - Imaging for RT Planning
 - Simulation
 - Treatment Planning
 - Pre-Treatment Review and Verification
 - Treatment Delivery
 - On-Treatment Quality Management
 - Post-Treatment Completion
 - Equipment and Software Quality Management
- ect all that apply.
- tment Delivery
- Treatment Quality Management
- Treatment Completion
- ment and Software Quality Management

RO-ILS Status as of 7/8/15

- Live June, 2014
- Signed contracts: 61 representing 123 facilities
- 43 pending representing 85 facilities
- 636 reports in system
- Four quarterly reports transmitted to users

Will it be useful?

- How to get actionable recommendations from the data?
- Review group looks for patterns
 - Dependent on the narratives
 - Cannot easily gather more information
- Statistics not yet useful, will they be?

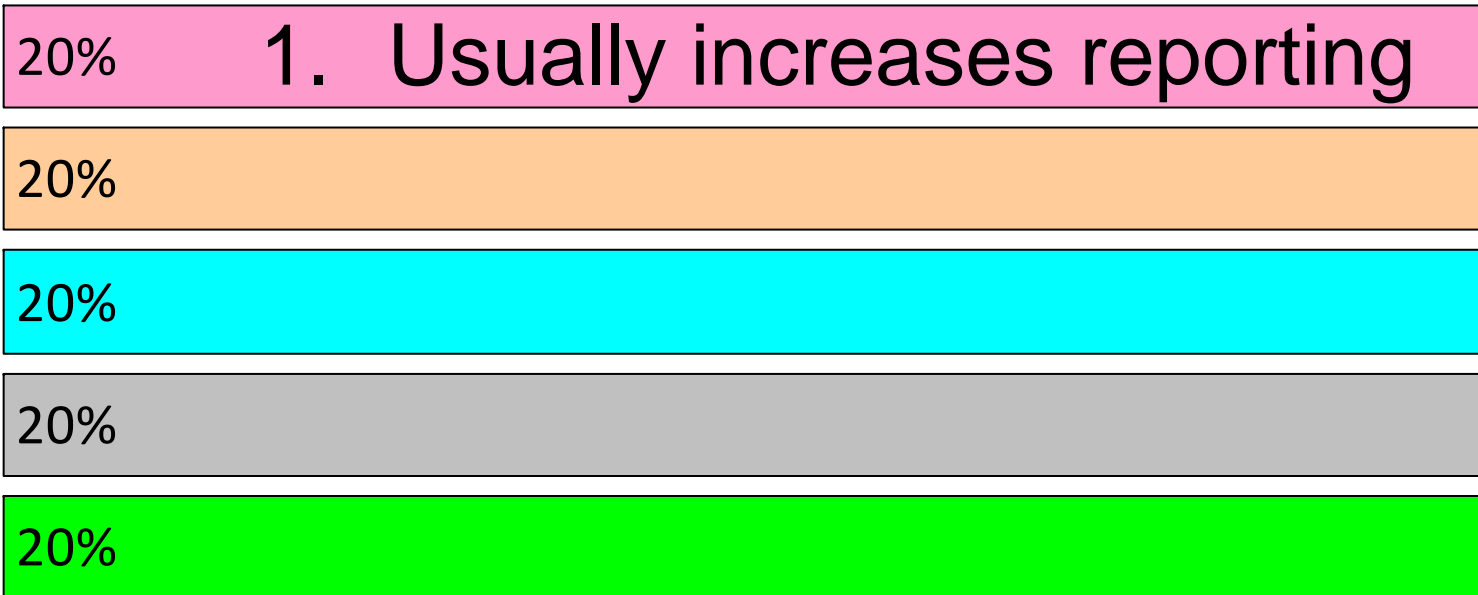
Example

- Plan done by mistake on “old” CT dataset
 - At least five reports in the first year
- User recommendation: put date in scan name
- RO-HAC recommendation: work with TPS vendors to warn planner that old scan is being used

Compared to a paper ILS, an electronic system ...

- 20% 1. Usually increases reporting
- 20% 2. Usually decreases reporting
- 20% 3. Is more difficult to analyze
- 20% 4. Requires a physical filing system
- 20% 5. Is trivial to design

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In order to incentivize reporting, it is recommended to

- 20% 1. Ask leaders not to participate
- 20% 2. Keep the deliberations secret
- 20% 3. Offer rewards and recognition
- 20% 4. Tie participation to pay increases
- 20% 5. Avoid making big changes

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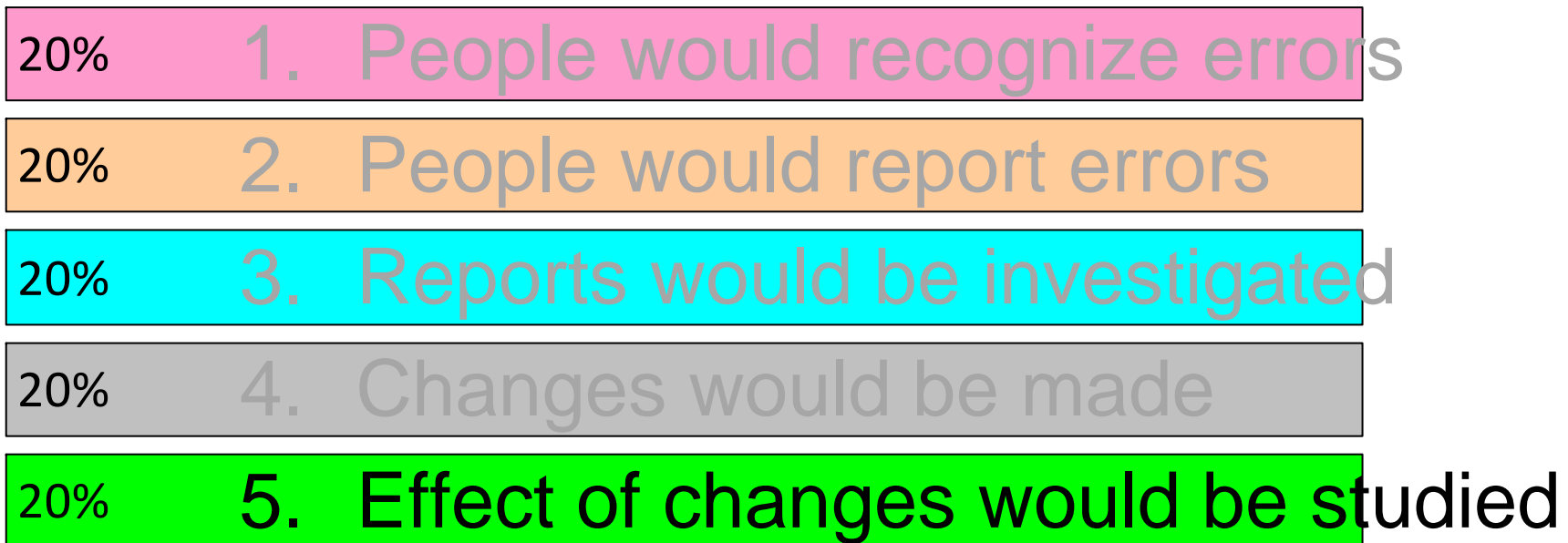
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In a survey of staff confidence in the ILS, there was least confidence that

- | | |
|-----|---------------------------------------|
| 20% | 1. People would recognize errors |
| 20% | 2. People would report errors |
| 20% | 3. Reports would be investigated |
| 20% | 4. Changes would be made |
| 20% | 5. Effect of changes would be studied |

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