



ROSI – An Overview

Radiation Oncology Safety Information System

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ROSIS

International Web-based
system developed to improve
safety in radiotherapy

www.rosis.info



ROSIS - background

- Incidents can have serious consequences in radiotherapy
- Information about incidents is generally not shared between radiotherapy departments
- Lost opportunities to learn from incidents and prevent injury to future patients
- To be proactive rather than reactive



ROSIS - Aims

- To improve safety
 - By enabling Radiotherapy departments to share and view reports on incidents
 - By collecting and analysing information on the occurrence, detection, severity and correction of Radiotherapy incidents
 - By disseminating the results and promoting awareness of incidents and a safety culture in Radiotherapy



ROSIS - Aims

- To establish an Internet-based system to enable
 - Reporting incidents and near incidents
 - Sharing this information through web-access to a central database
 - Analysis of the incidents and near incidents



ROSIS - Aims

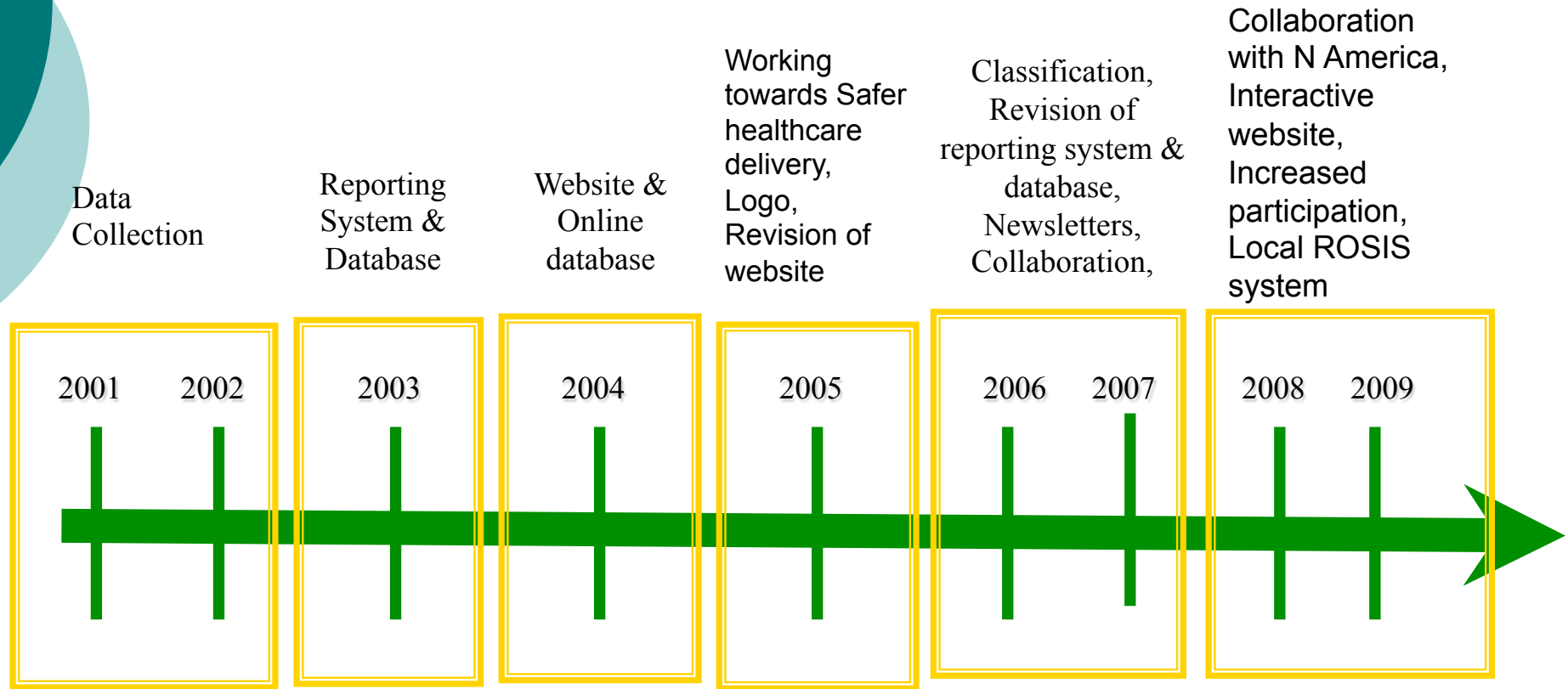
- To establish an Internet-based system to enable
 - radiotherapy clinics to address safety issues before an accidental exposure occurs
 - A general culture of safety awareness by making information available on details of incidents, near-incidents and corrective actions, submitted on-line by other radiotherapy clinics.



ROSIS - Aims

- To investigate ways in which
- a hazard classification system can be defined
 - frequency analysis can be performed
 - together leading to the identification of safety-critical steps in the radiotherapy treatment process where errors are likely to occur or to be detected
 - To identify trends

ROSIS - Timelines



ROSIS - Timelines

Extended
classification
system

Redesigned
website

Pilot of IAEA
SAFRON

Working
towards Safer
healthcare
delivery
Australia

The future
Collaboration with
SAFRON

Elekta/Varian
project

2011

2012

2012

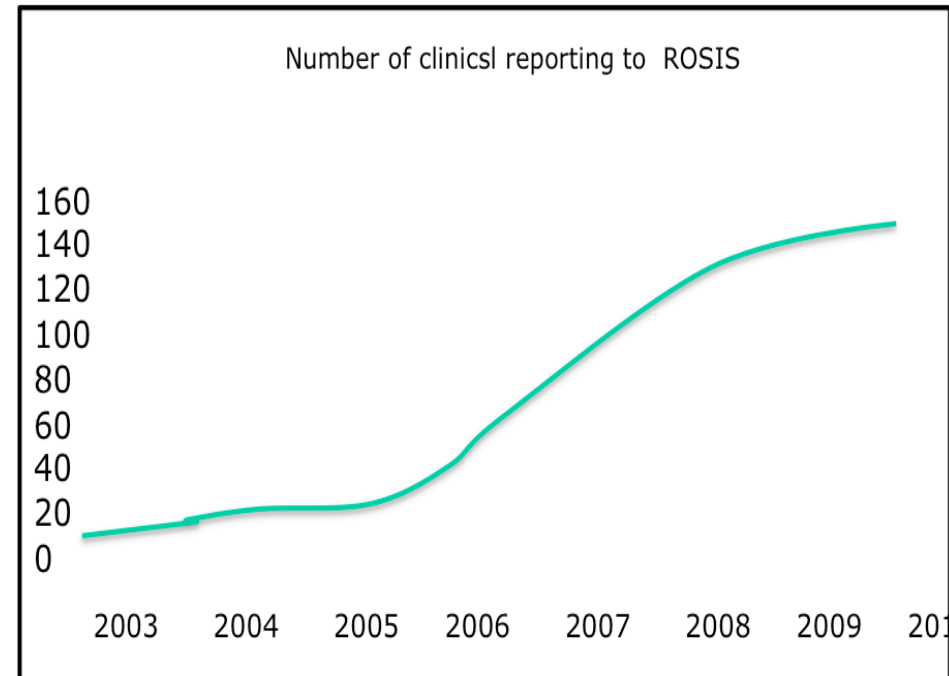
2012

2013 onwards

2013 onwards

ROSIS – department statistics

- 150+ Departments registered worldwide
- Europe
 - 91 departments representing 16 countries
- Africa, Asia, Australia, North America/Canada, South/Central America
- Up to 24 departments per region



ROSI – department statistics

Number of patients per member of staff

Discipline	Average number of patients	ESTRO HERO data (median)
Oncologists	281	196 (72-451)
Physicists	387	302 (139-544)
RTTs at treatment unit	159	63 (27–233)
RTTs at Simulation	546	
Dosimetrists	549	
Technical/ Maintenance	833	

ROSIS – department statistics

QA Activity	Total %
Chart check	90
In vivo dosimetry	34
Peer review	56
Portal images	94
Regular clinical review	73
Quality control procedures	91
Procedures for clinical processes	63
Formal Quality Management System	35
Regular QA of treatment units	98
Audit programme	69
Other QA	28

ROSIS – department statistics

- External Audit
 - The majority of departments (68%) participate in an audit programme

Audit system	Number of participating departments
IAEA	10
Equal/ESTRO	18
Radiological Physics Centre (RPC) at MD Anderson	7
Other regional/national	23
Not specified	24



ROSIS Reports

- 1074 reports analysed
 - External Beam RT - 97.7% (1049)
 - Brachytherapy - 1.9% (20)
 -
 - Other modalities - 0.5% (5) (mainly non-process)



ROSIS reports

- In 576 (51%) reports some treatment was delivered incorrectly
- 86% of incidents affected 1-3 fractions
- In approx. 15% of cases almost full prescription delivered incorrectly



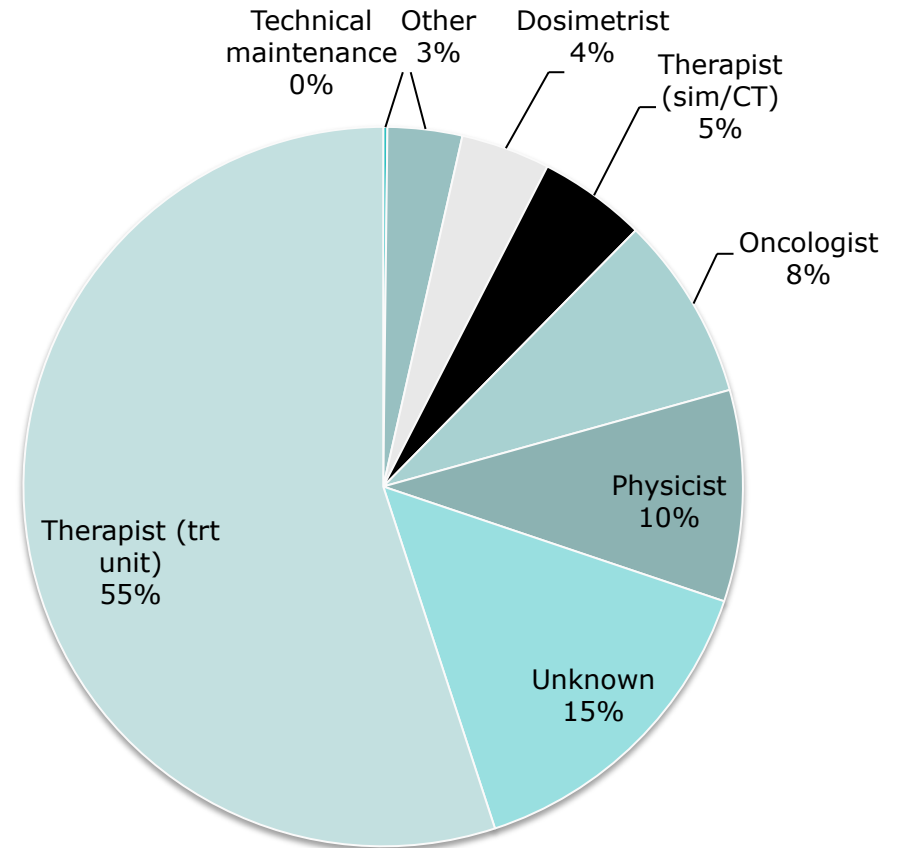
ROSIS reports: detection

- When
 - Treatment stage - 73%
 - Pre-treatment – 25%
 - Follow-up – 2%
- Who
 - The majority (56%) of the reported incidents were detected by Therapists at the treatment unit

ROSIS Data: Who discovered

○1074 reports analysed

- External Beam RT
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- Other modalities
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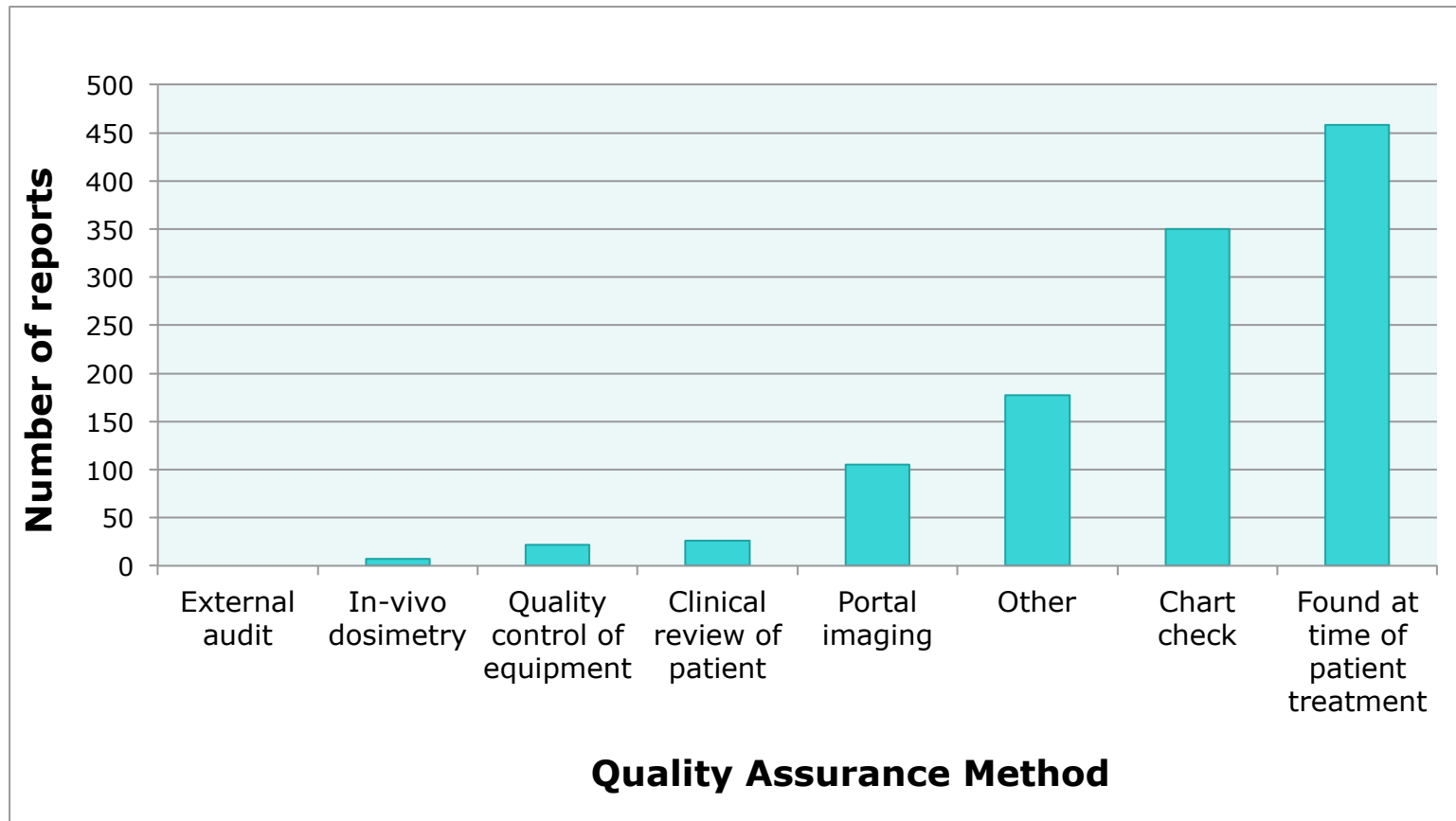




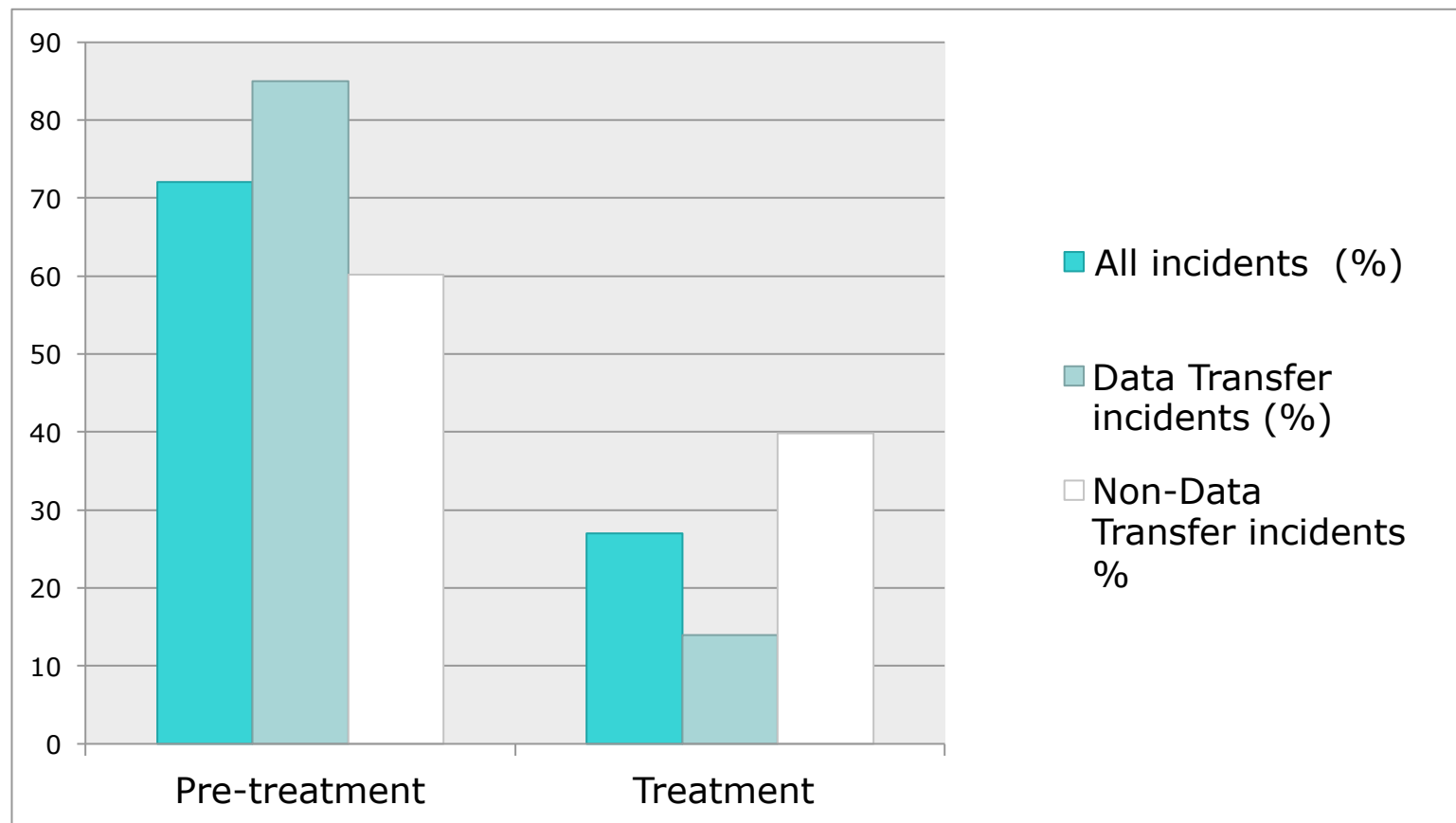
ROSIS reports: detection

- How
 - 43% - Detected at the time of patient treatment
 - 33% - Detection by chart check
 - Approximately 50% (168) of the chart checks reports were detected pre-treatment, the other half (167) were found during treatment or at follow-up
- Shows the importance of continuous vigilance

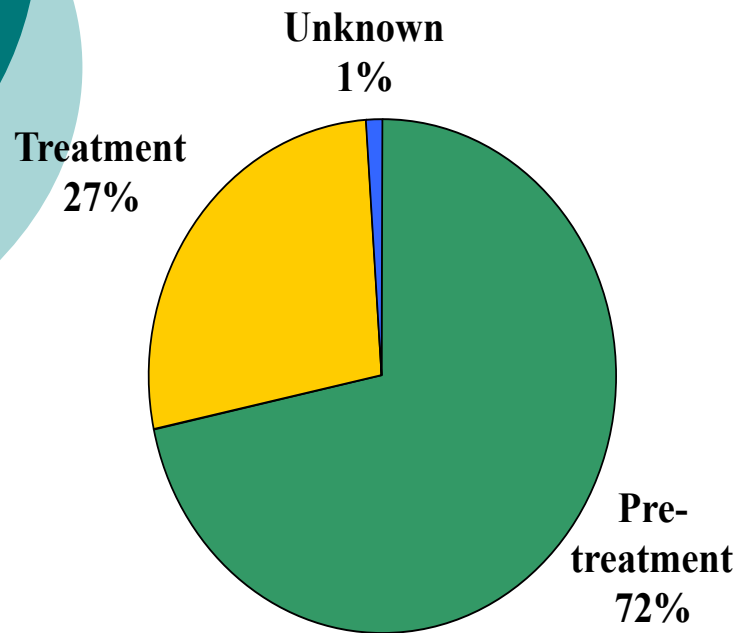
ROSIS Data: How discovered



ROSIS Data: Origin of incidents

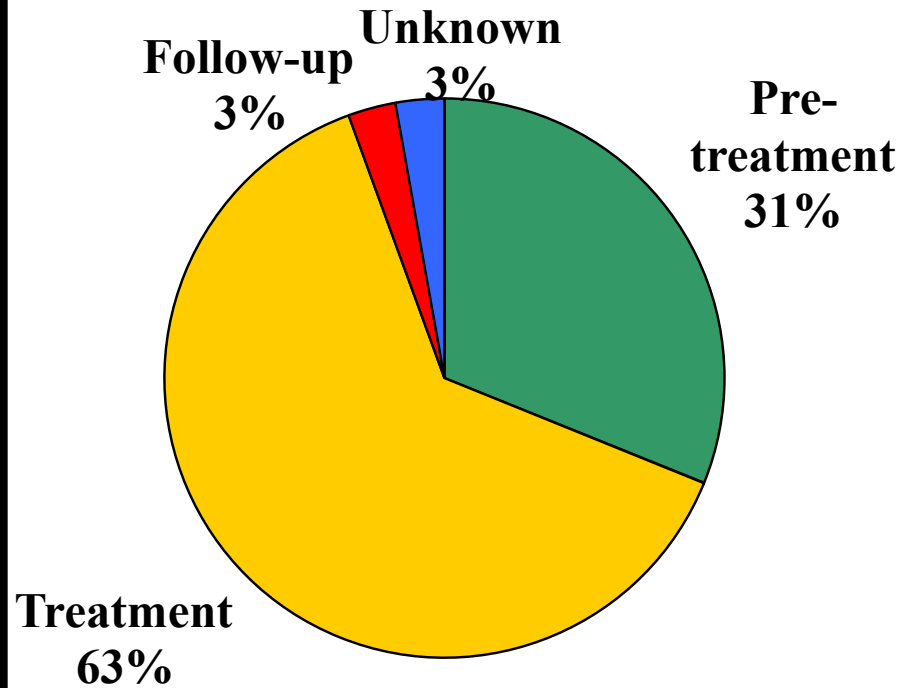


Incident Origin



Most incidents/near incidents originated **pre-treatment**

Incident Discovery



Most incidents/near incidents were discovered at **treatment**



ROSIS Data: QA / QC role

- 1200 registered incidents analysed
 - **331 detected through chart check**
 - 22 detected through clinical review
 - 18 detected through equipment QA



ROSIS – Record and Verify incidents

- Record and Verify causing/contributing: 147/600 (24.5%)
 - Data input, software/network problems, violations, failure to update with changes



ROSIS – Record and Verify incidents

- Data Input into Record and Verify: 115/600 (19.2%)
 - 30% of Treatment Volume Reports (56/185)
 - 16% of Accessory Reports (19/119)
 - 15% of Dose Reports (29/192)
- 83% occurred at the pre-treatment stage
- 62% discovered at time of treatment
- 53 (46%) Resulted in incorrect treatment

ROSI Data: Data Transfer

- Wide variation in data transfer capabilities and networking in the departments
 - 62% of reports where incident had a data transfer component were discovered at treatment
 - 46% resulted in incorrect treatment delivery



ROSI Data: Patient identification

- 16 cases reported to ROSIS
 - Consistent with the literature
- “The potential for misidentification errors is greatest in acute care hospitals
 - Wide range of patient interventions
 - Carried out in various locations
 - Staff working shift
 - Policy Directive, Department of Health, NSW



ROSIS Data: Patient identification

- 4 incidents/near incidents could have been prevented if protocols or guidelines had been in place
 - Student brought incorrect patient into the treatment room – discovered when staff addressed the patients
 - Incorrect patient brought into the treatment room – reference marks did not fit

ROSIS Data: Patient identification

- 4 incidents/near incidents could have been prevented if protocols or guidelines had been in place
 - Label in header on the treatment chart different to patient barcode
 - Barcode correct – incorrect inclusion of patient labels at different points in the patient pathway



ROSI Data: Patient identification

- 4 incidents/near incidents could have been prevented if protocols or guidelines had been in place
 - New patient admitted – same name as previous patient in that bed, treatment booked
 - Detected when administration clerk checked date of birth



ROSI Data: Patient identification

- The negative side of protocols (7 incidents)
- Two patients with the same pathology to start treatment
 - Second patient informed staff that his name was not correct
 - Data checked and found to be incorrect
 - First patient slightly deaf – treated in error
 - Set up references were ignored



ROSIS reports: Biases

- Voluntary reporting – not true cross-section
- Reporting bias – e.g.
 - Not all types of incidents might be reported
 - Not true frequency of each incident
 - Not absolute relative frequency of incidents
- BUT DO get useful information on
- Types, causes and discovery of errors reported