A timeout is defined as ‘an immediate pause by the medical team to confirm the correct patient, procedure, and site’ initially viewed as a safety measure to prevent harm as a result of providing medical care on the wrong patient or the wrong site or performing the wrong procedure.

Timeouts have evolved to include quality patient care and enhanced performance of the medical team. In radiotherapy and radionuclide therapy facilities this is sometimes accomplished using a policy, procedure, form or checklist. Radiotherapy and radionuclide therapy facilities can have various checklist or timeout procedures throughout the entire process, which can occur when performing calibration or quality assurance on equipment; when preparing and reviewing patient treatment planning; during procurement of radionuclides for therapy; or at the time of administering radionuclide therapy or radiation treatments.

A timeout is very effective before administration of radiation to the patient. It is sometimes the last line of defence to prevent an error from occurring. Important aspects of a timeout procedure are to ensure that everyone: knows what is expected; understands the value of taking the pause to review critical machine or treatment information; and is empowered to stop the continuation of the activity if the results of the timeout indicates that something might be incorrect.

However, we see that timeouts are not always used as designed. Some of the issues with timeout procedures include:
- A lack of a formal timeout policy and procedure;
- Timeouts occurring during the process that are
January 2021 Updates on patient safety in radiotherapy

In the SAFRON Radiation Therapy Reporting and Incident Learning System, we can see several examples where timeout could have been used to prevent an unintended exposure to the patient: in external beam radiotherapy we have cases where the wrong patient was treated; in brachytherapy we have cases where the wrong treatment area was treated; in radionuclide therapy we have cases where the wrong radiopharmaceutical was administered. An example of each is provided on later pages.

Just how important is timeout?
Using data collected in SAFRON we can see the number of cases where timeout prevented an unintended exposure, where it could have prevented an unintended exposure and where if it was in place it might have prevented an error.

When time outs are performed well, they reflect on the facility’s ability to prioritize a patient-centred safety culture and develop a work environment of trust where staff are empowered to report patient safety events without fear of reprisal. During a timeout, the team comes together, increasing the chances that all members will have the situational awareness needed to prevent harm.


<table>
<thead>
<tr>
<th>SAFRON</th>
<th>External Beam Therapy</th>
<th>Brachytherapy</th>
<th>Radionuclide Therapy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Timeout procedure failed to identify the incident?</td>
<td>110</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Timeout procedure identified the incident?</td>
<td>10</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Timeout procedure might have identified the incident?</td>
<td>160</td>
<td>29</td>
<td>10</td>
</tr>
</tbody>
</table>

Read more on timeouts used in radiotherapy:
- A Comprehensive and Feasible QA Program for Surface Guided Radiotherapy
- Timeout for Contrast: Using Physician Behavior Modification to Reduce Contrast in the Catheterization Laboratory
- The Effect of Medication Reconciliation Timeout on Patient Safety: An Evidence-Based Project
- Everyone has Their Role to Play During the World Health Organisation Surgical Safety Checklist in Australia: A Prospective Observational Study

The IAEA developed a leaflet entitled Check, Review and Report to support some of the items that should be checked at different stages in the process of radiotherapy. This could be used to develop the timeout procedure for physicians, medical physicists and radiation therapists.

NEW e-learning course

Safety and Quality in Radiotherapy

This course provides continuing education to radiotherapy professionals all over the world in safety and quality in radiotherapy. Available in English and Spanish.

- Improve your understanding of safety in radiotherapy;
- Learn techniques to reduce and avoid radiotherapy incidents;
- Understand the value and use of incident learning systems;
- Learn about useful sources of information to enhance safety in radiotherapy;
- Gain insight into improving safety culture in medical clinics/facilities.

Join the 3100 people who have already taken the online course.

Find more information on the RPOP website.
Learning through experience: Using SAFRON Incident Learning System in Philippines – case study

Radionuclide therapy events: What we can learn and what to do?

The role of medical physicists in quality, patient safety and error reduction in the era of modern radiotherapy

RPOP webinars
Click on the webinar tile to play

Training and education to reduce unintended exposure

Safety culture: Requires non-stop attention
Wrong patient treated

Treatment modality: External beam radiotherapy

Did the incident reach the patient? No

Equipment used: Linear Accelerator

Treatment method: 3D (three dimensional) conformal

Date of discovery: 2019-06-27

Who discovered the incident? Radiation therapist/staff at treatment unit treating patients

How was the incident discovered? Chart check

What phase in the process is the incident associated with? 3.2.1. Treatment

Where in the process was the incident discovered? 2.1.1. Identification of patient

Was anyone affected by the incident? Yes, more than 1 patient - 2

Was any part of the prescribed treatment delivered incorrectly? Yes

First day of treatment: No

How many fractions were delivered incorrectly? 1

Total number of fractions prescribed: 24

Prescribed dose per fraction (Gy): 2.00

If relevant, please estimate the dose deviation from the prescribed dose per fraction:
Clinical incident severity: Potential serious incident

If the incident-cause is related to equipment (hardware or software), please specify the make, model and version number:

Describe the incident in detail: Two patients with similar names were in the waiting room. Both patients had planned pelvic radiotherapy. RTT returning from vacation, did not recognize the patients from face. As a result, the wrong patient was irradiated. Moreover, the patients were about one age, height and weight. Therefore RTT did not noticed the difference even in portal images (isocenter location was almost the same for both patients).

Describe the causes of the incident:
1.4 Inadequate communication of procedure
5.2 Lack of communications

What safety barrier failed to identify the incident? Intra-treatment monitoring

What safety barrier identified the incident? Verification of patient ID
Time out

What safety barrier might have identified the incident? Verification that pretreatment condition have been taken into account

Describe contributing factors to the incident:

Suggest preventive action(s):
View Incident Report

You can view incident report details below.

<table>
<thead>
<tr>
<th>Brachytherapy plans not optimized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Treatment modality:</td>
</tr>
<tr>
<td>Did the incident reach the patient?</td>
</tr>
<tr>
<td>Treatment method:</td>
</tr>
<tr>
<td>Date of discovery:</td>
</tr>
<tr>
<td>Who discovered the incident?</td>
</tr>
<tr>
<td>How was the incident discovered?</td>
</tr>
<tr>
<td>What phase in the process is the incident associated with?</td>
</tr>
<tr>
<td>Where in the process was incident discovered?</td>
</tr>
<tr>
<td>Was anyone affected by the incident?</td>
</tr>
<tr>
<td>Was any part of the prescribed treatment delivered incorrectly?</td>
</tr>
<tr>
<td>First treatment fraction (for multi-fraction course of treatment)</td>
</tr>
<tr>
<td>How many fractions were delivered incorrectly?</td>
</tr>
<tr>
<td>Total number of fractions prescribed:</td>
</tr>
<tr>
<td>Prescribed dose per fraction (Gy):</td>
</tr>
<tr>
<td>If relevant, please estimate the dose deviation from the prescribed dose per fraction:</td>
</tr>
</tbody>
</table>
Clinical incident severity: Potential serious incident

If the incident-cause is related to equipment (hardware or software), please specify the make, model and version number: Not applicable

Describe the incident in detail: The plan for brachytherapy not optimized

Describe the causes of the incident:
1.3 Standard/Procedure/Practice not followed
1.4 Inadequate communication of procedure
5.3 Inadequate direction/information

What safety barrier failed to identify the incident?
Physician peer review
Review of treatment plan
Time out

What safety barrier identified the incident?
Independent confirmation of dose calculation

What safety barrier might have identified the incident?
Physician peer review
Review of treatment plan
Time out

Describe contributing factors to the incident:
Inattention to details; work environment; presence of distractions

Suggest preventive action(s):
Attention to details, Proper communication and endorsements, No interruption zones. Review of treatment plans before approval and execution, Regular chart checks and time outs
Patient received the wrong dose for thyroid cancer

Treatment modality: Radionuclide therapy
Did the incident reach the patient? Yes
Route of administration: Oral
Conditions treated: Thyroid cancer
Radiopharmaceutical: I131 NA Iodide capsules
Date of discovery: 2019-07-16
Who discovered the incident? Other, please specify/no information provided
How was the incident discovered? Post therapy Imaging
What phase in the process is the incident associated with? 2.3.3. Choice of activity and fractionation
Where in the process was incident discovered? 3.3.7 Other
Was anyone affected by the incident? Yes, one patient
Was any part of the prescribed treatment delivered incorrectly? Yes
What was the dose or administered activity prescribed?: 0.518 GBq
What dose or administered activity was delivered?: 1.221 GBq
If relevant, please estimate the dose deviation from the prescribed dose per fraction: >50%
Clinical incident severity: Minor incident
On July 16, 2019, the facility reported that a patient undergoing treatment with iodine-131 (I-131) for thyroid cancer received a dose that was at least 10 Gy (1,000 rad) more than expected and at least 50 percent greater than that prescribed. The written directive prescribed 0.518 GBq (14 mCi) of I-131 to deliver a thyroid dose of 400 Gy (40,000 rad). Post treatment, the licensee determined that the patient was administered 1.221 GBq (33 mCi), resulting in a thyroid dose of 965 Gy (96,500 rad). The patient and the referring physician were both informed of the event. The licensee reports that no adverse health effects are anticipated for the patient.

Describe the causes of the incident:

1.2 Inadequate standard/procedure/practice
1.3 Standard/Procedure/Practice not followed
1.4 Inadequate communication of procedure
1.5 Inadequate assessment of risk
3.2 Inadequate design specification
3.5 Inadequate assessment of operational capabilities

What safety barrier failed to identify the incident?
Time out verification of correct patient, activity and radionuclide prior to treatment

What safety barrier identified the incident?
Independent confirmation of activity prior to administration (i.e. a second in house check of activity)

What safety barrier might have identified the incident?
The licensee determined that the root cause for this event was human error. The licensee’s certified nuclear medicine technologist (CNMT) did not follow procedures and thus did not verify that the correct dose was being given to the patient. The CNMT performed a time-out procedure, which included reviewing the written directive, verifying it with the attending physician, and having the CNMTs perform a dose assay on the 0.518 GBq (14 mCi) NaI therapy capsule. After performing adequate patient identification procedures, the CNMT went to the nuclear medicine laboratory and collected a 1.2 GBq (33 mCi) therapy capsule instead of the 0.518 GBq (14 mCi) capsule. The CNMT did not look at the label to ensure it was for the intended patient and administered the 1.2 GBq (33 mCi) capsule.

Describe corrective action to take, e.g. modification of remaining treatment:
All CNMTs have been retrained on the importance of following established policies and procedures for administration of therapeutic radiopharmaceuticals, including checking the label to ensure that the medication is for the correct patient. The CNMTs are now required to use a workstation on wheels to confirm the dose again before administration. In addition, all therapeutic radiopharmaceuticals will be stored in the...
licensee’s radiopharmacy until the patient is present and the staff is ready to conduct the time-out. Multiple therapy doses will not be stored in the nuclear medicine laboratory.

Who should be or has been informed about the incident (e.g. patient, responsible physician, hospital management, regulatory authority)?

Suggest preventive action(s):