Conclusions: The highest correlating measure with respect to clinical assessment was found to vary according to the structure under consideration. Clinical assessment of the accuracy may be influenced by the complexity of the structure to draw and its relative importance in planning. In contrast the quantitative measures may reflect the variation of the structure within the population and the errors that could occur when using atlas-based contouring - i.e. the cord may have a 2D displacement, whereas the parotids may vary in shape more. The Hausdorff measure was found to be poorly correlated with experts’ assessment reflecting the Hausdorff measure’s sensitivity to outliers. Therefore, multiple quantitative measures should be reported when assessing atlas-based contouring.

POSTER: RT TRACK: PATIENT CARE AND PATIENT INFORMATION

PO-0947
Breast cancer patients' knowledge of RT at the beginning of their RT period
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Purpose/Objective: The aim of patient education is to provide patients the necessary knowledge and skills about health problems and treatment. With knowledge patients can be empowered to make informed choices and take care of themselves. Patient education is an essential part of a RT period, because of treatments psychosocial and physical side effects. For this patient education to be as effective, it should be based on an evaluation that is able to describe patients’ knowledge. The purpose of this study is to report the results of descriptive study that evaluated the breast cancer patients’ knowledge of RT at the beginning of their RT period.

Materials and Methods: 133 breast cancer patients in one university hospital of Finland were surveyed with ‘Knowledge Test of RT for Breast Cancer patients’ (KTRT-BC) tool, which is a 28 item ‘yes/no’ questionnaire. The content of the tool was the bio-physiological knowledge consisted of ‘RT process’ (7 items) and ‘Possible side effects’ (7 items) themes and the functional knowledge consisted of ‘Side-effects and self-care’ (7 items) and ‘Lifestyle and RT’ (7 items) themes. The data was collected at the beginning of RT period before first RT session. It was possible to have 7 points from each theme.

Results: Patients received test average 21.65 point knowledge of the RT process and which could be removed. They were also asked whether there existed barriers of implementing advanced practice were also explored. Results indicated that there is significant support within New Zealand radiation therapy departments for formalised Advanced Practice roles. A diverse range of perceived advantages for the profession were identified, however many in the profession expressed concerns around accountability, acknowledgment and support.

Conclusions: There was similar support for all profiles and criteria in radiation therapy. How Advanced Practitioner roles can be used will be dependent on the culture and needs of each clinical RT department. It was identified that ‘advanced skills’ may be become ‘standard skills’, therefore it is important that an Advanced Practitioner role focuses on leadership that continually develops academic innovations and best practice within the role. Generic academic structures are needed to give flexibility to support RTs seeking these roles.

PO-0950
Quality assessment of transferring competences from one staff group to another.
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Purpose/Objective: With increasing use of online pretreatment IGRT comes increased demand for reviewing resources. It is therefore desirable to shift the competence of reviewing these images to the treatment staff. The purpose of this study is to compare the quality of image matching for rectal and anal cancer patients done by two different groups of staff.

Materials and Methods: In our department physicists have the reviewing competence for IGRT. A few years ago this competence was transferred to radiation therapist nurses (RTNs) for prostate seed matching. This study describes the transferring of reviewing competence for rectal and anal treatments to RTNs. RTNs attended training sessions and had to take an exam before being allowed to review pretreatment cone beam computed tomography (CBCT) unassisted. The training sessions consisted of a lecture by an...
oncologist where general anatomy of the pelvis and delineation guidelines were explained. This was followed by at least two training sessions with a physicist where hands-on image matching were performed. Additionally RTNs had access to detailed written instructions with clinical examples. For the exam RTNs had to match five patients: two of 1.0 mm and 0.5 mm Demas representing two different pellets of 1.0 mm and 0.5 mm Demas between two physicists using an automatic bone match function. The range of translations and rotations in the exam results were compared for eight RTNs and six physicists. This was done by subtracting the maximum and minimum translations and rotations for all participants for each patient. RTNs were asked to call a physicist if the match differed by more than 5.0 mm within the PTV region or if patients were rotated > 3.0°. RTNs also had to decide whether or not to initiate a new no action level (NAL) imaging sequence.

**Results:** The maximum of the observed ranges of translations and rotations are shown in the top part of table 1. One patient was a ‘trick’ patient (patient 4) which could not be matched by the automatic bone match algorithm. This patient is not included in the top part of table 1. The bottom part of table 1 shows the number of RTNs who indicated the need to call for physicist assistance or initiate a new NAL sequence, compared with what was expected.

### Table 1: Top: Maximum observed range of translations and rotations for RTNs and physicists respectively. Bottom: No. of times a RTN indicated the need to call a physicist for assistance or initiate a new NAL sequence, compared with the expected results.

<table>
<thead>
<tr>
<th>Staff Group</th>
<th>Translation (cm)</th>
<th>Rotation (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTNs</td>
<td>X</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>0.20</td>
<td>0.02</td>
</tr>
<tr>
<td>Physicists</td>
<td>X</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Patient No.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RTNs</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Should call physicist</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Should start new NAL</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Did call physicist</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Should start new NAL</td>
<td>8</td>
<td>0</td>
</tr>
</tbody>
</table>

**Conclusions:** We have shown that different groups of staff obtain very similar results when using the automatic bone match method of the CBCT software. None of the RTNs would have treated a patient when they should have called for assistance. Some wanted assistance where it was not needed, but we expect that this is due to lack of experience and confidence. A yearly review exam of each RTN is planned to avoid that increased confidence results in superficial image reviewing.

We have implemented a systematic approach for authorising individual RTNs for unassisted CBCT matching. This ensures that patient safety and reviewing quality is not compromised by having RTNs rather than physicists reviewing images. We expect to extend the reviewing competences of the RTNs to other treatment sites e.g. lung — and we plan to use the above approach to ensure the competency of the RTNs.

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**PO-0951**

**Education without borders. A Danish – Swedish collaboration using 3-D simulation in education of RTTs**

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**Purpose/Objective:** In one of the largest Danish radiation oncology clinics a virtual training centre is used in the education of RTT’s. This is based on a 3-D simulator, VERT. There is no VERT available in Sweden, where the education is organized with a combination of e-learning based theoretic education and seminar days, followed by clinical training in radiotherapy clinics. Since 2009 80 Swedish students have completed a one day educational course in Denmark with the use of the VERT-simulator. This course lecturer was two Danish RTTs. Teaching language was Danish.

With this study we want to evaluate the Swedish RTT students’ view of the education day in relation to:

- What is the importance of the one day program, in the context of other parts of the theoretical and clinical education?
- Is the day scheduled appropriately in relation to other parts of the education process?
- Is there a language barrier so Swedish students cannot be educated by Danish lecturers?

**Materials and Methods:** The study is performed by using three semi-structured written questionnaires. One questionnaire was given to each participant before the one-day course, another questionnaire after the one-day course, and one questionnaire ten weeks after the one day course.

Each questionnaire contained three or four questions and all questionnaires were written in Swedish.

**Results:** The survey was answered by all Swedish students during 2012, except one missing answer. The result of the survey before the day showed the great majority of the students had higher very high expectations of what the day could add to the other theoretic and clinical education: 92% rated 4 or 5 on a five grade scale. On the survey after the education day all responded that expectations have been fulfilled: 100% rated highest score ‘Very important’ whether expectations had been fulfilled. Regarding the question as to whether there was a linguistic problem as expectations had not been met; after the day almost all marked that the teaching language had been a more minor problem than expected. At follow-up 10 weeks or more after education day the students responded that the day had great or very great importance for the coming clinical course. 84% felt that the day was positioned correctly, some students (16%) felt that day could have come earlier.

**Conclusions:** The result of the survey clearly showed that the education day at VERT is of great importance regarding the understanding of radiotherapy. The day contributed positively to the other theoretical and clinical education and was well positioned in the timetable for the whole education process. Despite the fact that teaching was in a foreign language most students considered it as a minor problem.

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**POSTER: RTT TRACK: OTHER**

**PO-0952**

**Flexible scheduling for RTT’s work time in radiotherapy wards**

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**Purpose/Objective:**

1) to ensure that the political demands of handling the number of treatments within four weeks from first medical contact are met
2) make a flexible schedule planning which meets both the political demands and the RTTs wishes in their work-life balance
3) provide an opportunity for the patients, who can benefits from treatment appointments early in the morning or late in the afternoon
4) to provide efficiency in the use of economic, human and accelerator resources

**Materials and Methods:** We have been working with the culture in the group of RTTs, to make them see and understand the purpose and necessity of flexibility in their working schedule, and at the same time their own benefits in more flexible plan for working hours. When we are using this flexibility, it is necessary for us to have a group of RTTs, who are all well educated. The continuity around the patient has also been an issue.

We’ve tried to make a win-win situation, where both patients and RTTs are winners.

**Results:** To use the capability of a dynamic efficiency by closing up and down for the use of treatment time. With eight similar accelerators it is possible to move treatment plans between most of the accelerators. That makes it possible to fill free time in case of i.e. cancellations. We have extended the opening hour from 6.30 AM to 7.30 PM in the radiotherapy ward. The RTTs work in shift. The RTTs can decide to work 7.5 or 8 hours a day. Two accelerators are operating from 7.00 AM, and depending of the actual needs of the day, two to four accelerators are operating until 7.30 PM. This has resulted in a better use of all resources, but to make it work it demands close coordination and monitoring by ward management. The RTTs working schedule is planned four weeks ahead. The schedule is based on the wishes of the RTTs. Basic a long term planning adapted to a short time planning of wishes, and directed to the current needs of treatment planning. During the day there are up to 8 shifts and the facts that all 72 RTTs employed in the ward, are able to perform all kinds of treatments, make it possible to meet most of the RTTs wishes of working time for the specific day.

**Conclusions:** The flexible scheduling has been a main factor in our ability to meet the political demand of maximum patient waiting time for treatments. Now that we have seen the results and the opportunities of flexible scheduling, this will be an ongoing process in the ward. We will continue the work with flexibility both ways, to be able to continuously meet the increasing demands from patients, employees and politicians.