underestimation of the TPS dose calculations at intermediate
doses needs further investigation.

Conclusions: The EBT3-based in-vivo skin dose measurements
revealed an unexpected agreement with the TG43-based TPS for
the patients exposed to higher skin doses. Intermediate
calculated doses presented a large underestimation of the
measured doses to the skin as evaluated by the EBT3 films. The
clinical relevance of these findings requires further study.

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DOSIMETRIC COMPARISON OF 3D CONFORMAL RADIATION
THERAPY (3DCRT) AND VOLUMETRIC ARC THERAPY (VMAT) IN
PATIENTS WITH BILATERAL BREAST CANCER WITH INDICATIONS
FOR ADJUVANT RADIATION

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Purpose: Recent evidence demonstrating the survival benefit
with regional nodal radiation therapy (RT) has included the
internal mammary chain (IMC) in the treatment volume.
However, including the IMC can increase dose to the heart and
lungs, and this is especially challenging in patients who have
bilateral breast cancer. Case series for adjuvant RT in bilateral
patients have favoured VMAT, but many of these studies did not
encompass the IMC and do not report on the integral dose to the
heart, left anterior descending coronary artery (LAD) or lungs.
To determine if VMAT was superior to standard 3DCRT planning
for patients with bilateral breast cancer when the intent is to
treat the bilateral chest walls and nodal areas, including the
internal mammary chain (IMC) nodes, simultaneously.

Methods and Materials: Three patients treated with mastectomy
for bilateral, node-positive breast cancer were treated with a 7-
field mono-isocentric photon technique and direct electron field.
The 3DCRT technique included bilateral tangents, bilateral
supraclavicular-axillary volumes and a central, direct mixed
photon/electron fields. Retrospectively, mono-isocentric VMAT
plans were generated for the same volume for each patient.
VMAT plans using six coplanar arcs for the chest wall portion
were summed with the adjacent static bilateral supraclavicular
volumes and a central, direct mixed photon technique and direct
electron field. For bilateral, node-positive breast cancer were treated with a 7-
field mono-isocentric VMAT plans using six coplanar arcs for the chest wall portion
were summed with the adjacent static bilateral supraclavicular
volumes and a central, direct mixed photon/electron fields. Retrospectively, mono-isocentric VMAT
plans were generated for the same volume for each patient. VMAT plans using six coplanar arcs for the chest wall portion
were summed with the adjacent static bilateral supraclavicular
plan. Patients 1 and 2 were scanned, planned and treated using
a deep inspiration breath hold method, while Patient 3 was
scanned, planned and treated during normal breathing. Dosimetric results were compared between techniques for each
patient.

Results: Coverage of the target bilateral chest wall and IMCs
(CTV) was marginally higher in the VMAT generated plans as
compared to the 3DCRT plans (92.5-96.1% versus 87.1%-94.8%).
Dose to the IMC (V80 IMC) was similar between planning methods
(mean 99.3% 3DCRT versus 99.8% VMAT). Dose to the left lung,
heart, and LAD were all lower in the VMAT plans. V20 for both lungs was a mean of 18.4% for 3DCRT versus 31.6% for
VMAT plans. Mean heart dose was 9.6 Gy for 3DCRT and 13.5 Gy for
VMAT plans. Mean LAD dose was 5.6 Gy for 3DCRT versus 19.2 Gy
for VMAT plans.

Conclusions: Patients with bilateral breast cancer having
adjuvant RT including the IMC received significant dose to normal
structures. VMAT improved target coverage slightly compared to
3DCRT, but the dose to heart, LAD and lungs were greater in
VMAT plans, and may increase the risk of long-term cardio-
pulmonary toxicity and the rate of secondary malignancy.

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IMPLANTABLE DEVICES AND RADIATION EXPOSURE
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Purpose: To review the literature on radiotherapy for patients
with implantable electronic devices, including chest, abdomen
and brain implants. To provide an unreported example of
radiation near a pacemaker, where minimal dose from a later
radiosurgery treatment was apparently additive with earlier
higher dose treatment near the pacemaker: summed dose may
have resulted in pacemaker failure.

Methods and Materials: We review pacemaker guidelines, and
case reports for deep brain stimulators (three reports, one
article on vagus nerve stimulation devices), insulin pumps (100
million plus patients worldwide, with one review of insulin,
intrathecal and chemotherapy pumps), cochlear implants (300
thousand plus patients worldwide, eight reports), and retinal
implants (uncommon, first Canadian implant in 2014 - a single
guideline from the manufacturer was found).

Results: Our patient unexpectedly suffered pacemaker failure. The
risks to other devices are largely unknown.

Conclusions: There are gaps in the literature concerning
treatment of patients with common implantable devices. We
provide prudent, physics/physiology-based recommendations for
a Canadian-care tertiary facility context for implanted devices,
while data is lacking.

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INTEREST GROUPS: A VEHICLE TO INCREASING MEDICAL STUDENT
EXPOSURE TO ONCOLOGY
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Purpose: Medical students perceive a lack of formal exposure
to oncology-related topics during their training. The purpose of
this study is to report the impact of an oncology interest groups
(OIG) event on medical student interest in oncology as well as
comfort with oncology topics such as breaking bad news.

Methods and Materials: An extracurricular OIG event was
coordinated, through open invitation of all 60 first and second
year students from one campus of a larger medical school. One
physician panelist was invited from each of the following
specialties: surgical oncology, medical oncology and radiation
oncology. A general practice oncologist covering in-patient
oncology was unable to attend. The two hour event included
panel discussion of perceived pros and cons of a career in
oncology. Medical students were provided opportunity for
questions within the larger group setting or the three smaller
group break-out sessions, each facilitated by a panel physician
framing the discussion around the skill of breaking bad news. Pre-
and post-event surveys were used to assess the effect of this
event on medical student interest in oncology, perception of
oncology curriculum in their training and comfort level delivering
bad news.

Results: The majority of attending students (n =15/17, 88%)
responded to the survey. Student interest in pursuing an
oncology elective increased from 47% (7/15) pre-event to 67%
(10/15) post-event. Similarly, medical student interest in
pursuing a career in oncology increased from 47% (7/15) pre-
event to 53% (8/15) post-event. Pre-event, medical oncology
(7/15) and general practice oncology (2/15) were ranked as the
most interesting specialties in oncology, while post-event
medical oncology (5/15) and radiation oncology (5/15) ranked
highest. While all 15 students felt that it was important to have
a general knowledge of oncology in any practice, many students
felt that their program did not effectively cover oncology topics
in general (40%, 6/15) or specifically the delivery of bad news
(47%, 7/15). Only 13% (2/15) of students felt comfortable
delivering bad news to patients pre-event, although 80% (12/15)
felt more comfortable post-event. Few students (4/14, 27%) felt
they had adequate coping skills to deal with the morbidity and
mortality seen in an oncology practice prior to the event,
however, this increased to 73% (11/15) after the event.

Conclusions: Oncology interest groups can increase medical
student exposure to oncology specialties and help them explore
oncology as a possible career choice. OIG may also serve as a way
to further educate medical students regarding oncology topics
such as breaking bad news, to increase their comfort level with
such a skill that is crucial in all fields of medicine. The potential
educational value of such an event is particularly interesting and future studies of larger medical student groups are warranted.

130 TACKLING CULTURAL AND SOCIAL CHANGE: AN EXAMPLE OF A SUCCESSFUL QUALITY IMPROVEMENT INITIATIVE TO ENHANCE PATIENT SAFETY
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Purpose: This presentation will describe a quality improvement initiative that occurred in radiation therapy departments across British Columbia. This initiative harnessed the investigational response to several safety events in the province. The formative change involved the implementation of a Provincial Patient Identification Policy specific to radiation therapy delivery, across multiple centres with different operational needs.

Methods and Materials: The operationalization of the Provincial Patient Identification Policy utilized quality improvement fundamentals from the Plan-Do-Study-Act model. This initiative involved not only a simple procedural change, but also challenged deeply held beliefs and assumptions of Radiation Therapists in British Columbia. Radiation Therapists believed strongly that involving patients in daily identification protocols would create barriers to developing rapport and trust. As such, education involving the patient identification policy had to tackle the social aspects of change implementation, as well as the increasing effort to focus on improving patient experience by health care providers. Early on, this was recognized by Clinical Educators, and actively addressed. Transformative education took place which challenged the learners to examine their beliefs about patient perspectives and how this related to patient safety. Efforts to educate about the change were well coordinated with the implementation of the change itself. After the initial change, formal avenues for feedback were provided, and the procedures were refined. After several months, a provincial audit was performed.

Results: Preliminary audits performed on patient identification at two radiation therapy centres indicate that the implementation of the Provincial Patient Identification Policy has been a success. Two types of audits were carried out, these will be described.

Conclusions: Identifying and addressing the social aspects of change implementation is key to ensuring the success of quality improvement initiatives. Despite common myths and anecdotal evidence from Radiation Therapists, patients have appreciated their active involvement in daily treatment and safety checks.

131 THE HURDLES TO ONE HUNDRED: BARRIERS TO PEER REVIEW IN RADIATION ONCOLOGY
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Purpose: Peer review is the evaluation of the creative work or performance by other people in the same field to enhance the quality of work, or performance. In an effort to improve quality and standardization, a number of initiatives have been put in place at the national and provincial levels. In 2011 and updated in 2013, the Canadian Partnership for Quality Radiotherapy (CPQR) published Quality Assurance Guidelines for Canadian Radiation Treatment Programs. This document recommends that all radiation treatment plans administered with adjuvant or curative intent, and others plans where there is a significant potential for adverse patient outcome, undergo Radiation Oncologist peer review. The aim of this project was to identify and mitigate the barriers to an effective peer review program, to achieve the recommendations set forth in the CPQR guidance document.

Methods and Materials: A large urban comprehensive cancer centre performed peer review employing a site group model. 10 site groups are represented meeting on a weekly basis. A three month retrospective analysis was performed identifying all cases treated within the time period. Each case was characterized by: site; month; referral to review; and review status. Cases not referred for review and or did not undergo peer review were examined for barriers to successful peer review.

Results: The average peer review rate for the three month time period was 85.43%. 16.61% of patients did not receive a referral to peer review. 3.38% of patients were referred for review, however did not undergo peer review. Identified barriers to successful peer review included; human error, workload, resource limitations and culture change.

Conclusions: Peer review; has the potential to identify errors; serves as a forum for continuing education; and catalyzes standardization. By mitigating the barriers to peer review including; human error; workload; resource limitations; and adopting a culture promoting the initiative an increasing number of cases can be successfully reviewed, resulting in a high fidelity system to increase patient safety.

132 RADIATION INCIDENT SAFETY COMMITTEE AND THE NATIONAL SYSTEM FOR INCIDENT REPORTING IN RADIATION THERAPY: PARTNERS IN IMPROVING PATIENT SAFETY
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Purpose: The National System for Incident Reporting in Radiation Therapy (NSIR-RT) is an initiative between the Canadian Partnership for Quality Radiotherapy (CPQR) in partnership with the Canadian Institute of Health Information (CIHI). Cancer Care Ontario (CCO) has an established a Radiation Incident Safety Committee (RISC) with the goal of reducing the impact of radiation incidents across the province’s 14 radiation treatment programs (RTPs). CCO RISC has assessed its collective incident reporting processes in comparison to the provincial adoption of the NSIR-RT.

Methods and Materials: Facilitated by a face-to-face meeting of Primary Radiation Incident Leads (RILs), an assessment of current incident reporting processes of each regional radiation program was performed. Reporting tools, taxonomies and processes were collected for each of the 14 RPTs. The RILs met to discuss the current state of reporting in comparison to the CPQR proposed NSIR-RT. Benefits and barriers to the provincial adoption of the NSIR-RT platform were identified.

Results: 100% of RTPs had an established incident reporting process. 85% of RTPs reported radiation therapy incidents using software databases. Nine software systems were identified (three of which were developed in house) for the facilitation of incident learning. In addition, 100% of RTPs had locally specific incident reporting taxonomies. Evaluating the proposed NSIR-RT the following benefits and barriers were identified.

Benefits:
• Access to provincial dataset
• Unified taxonomy
• Cost neutral
• Reduced provincial reporting requirements

Barriers:
• Corporate buy-in
• Multiple data entry requirements/resources
• Access to provincial data-set
• Measures of success

Conclusions: Currently, 35% of RTPs are using NSIR-RT and 35% are in the progress of completing service agreements. In addition, work with CIHI to develop a CCO administrator role to