was sent to all 14 provincial cancer centres in 2013. The survey included 72 questions in four different categories: general/demographic, pre-treatment assessment, EBRT and BT questions.

**Results:** The response rate was 100%. Ten out of 14 centres treated cervical cancer patients and had a dedicated brachytherapy suite. All 10 centres that treated cervical cancer had a peer review process for quality assurance (QA). Nine centres had written treatment planning and delivery protocol and five centres used a specific plan evaluation protocol for organs at risk for EBRT. The standard EBRT technique was 4-field box in eight centres and one centre used IMRT if treating the para-aortic nodes simultaneously; one centre did not respond. The dose/fractionation scheme to the whole pelvis was 45-50 Gy in 25-30 Gy per fraction in all but one centre. Nine centres used image verification at some point during EBRT. All ten centres used HDR brachytherapy and one centre also used PDR brachytherapy to treat cervix cancer patients.

Brachytherapy was performed under general anesthesia, regional anesthesia and conscious sedation in four, one and five centres, respectively. Only one centre offered interstitial brachytherapy. The majority of centres (eight of 10) used ultrasound image guidance for treatment planning and applicator insertion. For treatment planning two centres used CT and MRI, four centres used CT only and four centres used orthogonal x-rays. GEC-ESTRO guidelines were used in three centres for target volume delineation and in five centres for organs at risk (OAR) dose constraints. Nine centres prescribed and reported dose to Point A. Volumetric dose prescription was performed in one centre and four centres reported dose to a target volume. Eight centres reported dose to OARs. The number of BT applicator insertions varied significantly between the centres ranging from one to six. The dose prescription was also variable ranging from 5.5 Gy to 8 Gy per fraction.

**Conclusions:** The main findings from the survey were the variation in the BT dose fractionation and treatment planning used in the regional cancer centres while there was a general uniformity in peer reviewed QA, written institutional treatment protocol, EBRT technique, dose fractionation scheme and use of HDR BT across the province. This study shed light on the need to implement a harmonized evidence-based brachytherapy practice for cervical cancer in order to improve patients’ outcome across Ontario, Canada.

15 FEASIBILITY OF COLLECTING PATIENT REPORTED OUTCOMES FOR PATIENTS RECEIVING CURATIVE INTENT RT FOR GYNECOLOGICAL MALIGNANCIES

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**Purpose:** The British Columbia Cancer Agency radiotherapy (RT) program started the Prospective Outcomes and Support Initiative (POSI) at all six centres in 2013 to collect and utilize patient reported outcomes (PROs) for patients receiving palliative intent RT. In 2015 it expanded to patients receiving curative intent RT, starting with the gynecological (gynae) tumour group. We sought to describe the success in expanding to non-palliative sites.

**Methods and Materials:** Five validated questionnaires, the EPIC Bowel 2 (2002), EPIC Urinary 2 (2002), PRO-CTAE GI toxicity, EORTC QLQ CX24, and the EQ5DL were selected as the PROs of interest by the gynae tumour group. The questionnaires were converted to tablet format, and data was entered directly by patients via tablet at time of RT, and each subsequent follow up (FU). Some centres choose to also administer the questions weekly during RT, which is categorized as FU below in comparing scores to baseline. The results of the questionnaires were made available immediately to Radiation Oncologists, viewable in the RT electronic medical record, and in a local intranet POSI Portal. Descriptive Statistics were used to present accrual data and results of the PRO questionnaires.

**Results:** From March 2015 to January 2016, 480 gynae patients were approached by POSI on 1007 occasions (i.e. baseline, on treatment, or FU), with a 97% response rate. However, not all six British Columbia Cancer Agency centres participated at that time, with Vancouver and Victoria starting in March, Abbotsford in July, Kelowna in August, while Surrey and Prince George have not yet participated. The mean (and standard deviation) scores of the EPIC Bowel, EPIC Urinary, PRO-CTAE GI, EORTC QLQ CX24, and EQ5DL were 8.9 (9.3), 7.3 (2.9), 2.9 (3.1), 4.2 (3.5), and 8.8 (3.2), respectively, with significantly (p < 0.05) worse scores at FU compared to baseline for each questionnaire, except the EQ5DL (p = 0.62). Of the 24 patients not accrued, 29% were unfit, 21% had no interpreter available, and 50% declined. Among those who declined, 33% did at baseline, 17% at first repeat measure, 25% at second, and 25% at the third or later repeat measure. Among the 189 patients who reported PRO on more than one occasion, 72, 37, and 80 patients repeated the PRO 2, 3, and > 3 occasions respectively to date.

**Conclusions:** Expansion of POSI to collect PRO in a radical tumour group appears feasible, though there have been barriers to expansion to all six British Columbia Cancer Agency centres, which will be explored. Despite the use of five validated questionnaires totaling 49 questions, the accrual rate is exceptional, and appears feasible weekly during radiotherapy. Expansion to other radical tumour sites will be used to test if these results are reproducible. Future plans are to test the impact of providing PRO data to clinicians, and to make gynae PRO data available for research and quality improvement initiatives.

16 DO YOUNG WOMEN BENEFIT FROM BREAST BOOST RADIOTHERAPY IN THE HORMONE THERAPY ERA?

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**Purpose:** The EORTC 22881 boost trial showed a substantial benefit of delivering a radiotherapy boost to the tumour bed (RTB) in women aged 40 years and younger, with an improvement in 10-year local relapse-free survival (LRFS) of 10%. However, this trial was carried out in an era where pre-menopausal women did not receive adjuvant hormone therapy (HT). We sought to determine how the use of HT and RTB changed in a population-based cancer care program in response to new practice guidelines, and whether this had an impact on LRFS. We also set out to determine whether the anticipated benefit of a RTB for young women was observed in the era of routine HT.

**Methods and Materials:** A provincial database was used to identify all women 40 years and younger with breast cancer that met the inclusion criteria of the EORTC 22881 trial: treated with whole breast radiotherapy after breast conserving surgery, margin negative (not at ink), and Stage I and II. The percentages of women receiving HT and RTB were compared across three eras that were defined, a priori, with a three-month delay allowing for implementation of the practice changes: Era 1 (pre-HT, pre-boost) January 1996-September 1998; Era 2 (HT, pre-boost) January 1999 - September 2001; Era 3 (HT and boost) January 2002 - September 2004. LRFS was calculated using the Kaplan-Meier method and the three eras compared using a log rank test. Factors significant at α = 0.3 on univariate analysis were included with Era in a multivariable (MVA) Cox model.

**Results:** The study included 411 patients: 130 in Era 1, 142 in Era 2, and 139 in Era 3. The use of adjuvant HT increased over time, with 8% in Era 1, 45% in Era 2 and 54% in Era 3 (p = < 0.001). For estrogen receptor (ER) positive cancers, HT use was higher: 13% in Era 1, 68% in Era 2 and 82% in Era 3 (p = < 0.0001). The
use of RTB after adjuvant breast radiotherapy was 38% in Era 1, 29% in Era 2 and 76% in Era 3 (p < 0.001). Ten-year LRFS was 85.3% in Era 1, 93.9% in Era 2 and 91.9% in Era 3. On MVA there was a significant decrease in relapse going from Era 1 (pre-HT, pre-breath) to Era 2 (HT, no breath) (HR 2.2, p = 0.03), but no change in relapse from Era 2 (HT, no breath) to Era 3 (HT and breath) (HR 1.0, p = 0.97). For LRFS across all three eras, there was no significant difference for patients that received a boost (92.9%) and those that did not (88.6%, p = 0.31) but there was a significant improvement for ER-positive patients that received HT (91.8% versus 81.6%, p = 0.01).

Conclusions: This study showed that new breast cancer therapies were adopted swiftly in response to new clinical practice guidelines. The introduction of HT was associated with an 8.6% improvement in ten-year LRFS. However, for a population of patients that was routinely prescribed HT, no improvement in LRFS was observed with the addition of routine RTB. RTB causes toxicity and offers no survival benefit; its routine use should be re-evaluated in the HT era.

17 DOES DEEP INSPIRATION BREATH HOLD (DIBH) PRODUCE A CLINICALLY MEANINGFUL REDUCTION IN IPSILATERAL LUNG DOSE DURING LOCOMOREGIONAL RADIATION THERAPY FOR WOMEN WITH RIGHT-SIDED BREAST CANCER?
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Purpose: To determine whether DIBH produced a clinically meaningful reduction in pulmonary dose in comparison to free breathing (FB) during adjuvant locoregional radiation (RT) for right-sided breast cancer.

Methods and Materials: Thirty women with Stages 0-I left-sided breast cancer and who had both DIBH and FB CT scans as part of standard care were included. The right-sided IMC nodes were contoured according to ESTRO guidelines on DIBH and FB scans, with care taken to ensure comparability between scans. A four-field, modified-wide tangent RT plan was developed on each scan to include the right breast and full regional nodes, including a minimum dose of 80% to the IMC volume. The junction between the supraclavicular and tangent fields was at the inferior extent of the clavicle. Treatment plans were calculated in Eclipse using the Acuros algorithm version 11. FB and DIBH plan metrics were compared using Wilcoxon-signed rank testing.

Results: IMC coverage was equivalent between DIBH and FB plans; V80 was 100% on both plans and D100 was 39.2 and 39.5 Gy for DIBH and FB, respectively. Twenty-one patients (70%) had ≥5% reduction in ipsilateral lung V20 with DIBH compared to FB. The average ipsilateral lung V20 decreased by 7.8% (range: 0 to 20%; p < 0.001) and the mean lung dose decreased by 3.4 Gy with DIBH (range: -0.2 to 9.1; p < 0.001). The right lung absolute V20 Gy gain from DIBH was larger among patients with the highest V20 compared to 15 patients with the lowest V20 on FB (10.1% versus 5.6% respectively; p = 0.01). There was a mean reduction of 42.3 cc (range: 0 to 178.9; p < 0.001) in the volume of liver receiving 50% of the prescription dose. The differences in mean heart doses were not statistically significant, but not likely clinically significant: MHD was 0.88 Gy (range: 0.67 to 1.27) and 1.00 Gy (range: 0.75 to 1.48) (p < 0.001) for DIBH and FB, respectively.

Conclusions: DIBH reduced mean ipsilateral lung V20 by 7.8% and mean lung dose by 3.4 Gy. For some patients, the volume of liver receiving ≥25 Gy can also be reduced with DIBH. DIBH should be available as a treatment strategy to reduce right lung V20 without compromising IMC or supraclavicular nodal coverage for patients with right-sided breast cancer during locoregional RT. This strategy can be advantageous in cases where the ipsilateral V20 on FB approaches 30%, a value that prompts many radiation oncologists to exclude IMCs from the RT volume.

18 LOCAL CONTROL IN YOUNG WOMEN WITH EARLY-STAGE BREAST CANCER TREATED WITH HYPOFRACTIONATED WHOLE BREAST RADIOTHERAPY
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Purpose: Randomized clinical trials have shown equivalent local control for patients with early-stage breast cancer (BC) treated with conventional fractionation (CF) or hypofractionated (HF) adjuvant whole breast radiotherapy (WBRT). However, women less than 50 years of age have been underrepresented in these trials, and controversy still remains in relation to optimal fractionation schedule in this patient group. Our institutional policy allows for both schedules, therefore we compared local control in young women following breast-conserving surgery (BCS), and identified factors associated with recommendation of CF or HF schedule.

Methods and Materials: Two hundred and seventy-one women under 50 years of age with early-stage invasive BC (pT1-T2, pN0) treated from September 2009 to December 2013 were identified from an institutional database. BCS was followed by adjuvant CF (45 Gy in 25 fractions) or HF (40 or 42.4 Gy in 16 fractions) WBRT (OR = 0.33) WBRT, followed by a boost to the tumour bed of 10-16 Gy in 5-8 fractions. Data on tumour characteristics and adjuvant systemic therapies were collected. Length of follow up was calculated from the completion date of radiotherapy (RT) to the date of most recent imaging or clinical review in which disease status was recorded.

Results: Two hundred and twenty-seven (83.8%) patients were treated with HF and 44 (16.2%) with CF WBRT. Median follow up was 2.9 years (range 0-5.8 years) and median age was 42.8 years (range 19-49 years). Most patients had invasive ductal carcinoma (94%), unifocal (86%), Grade 1 or 2 (65%) and ER positive (88%) disease, of which 81% received adjuvant endocrine therapy. Lymphovascular invasion was associated in 16%, 54% received adjuvant systemic chemotherapy, 14% had HER2-positive disease and 8.5% of cases were triple negative (TN). Local control was achieved in 225 (99.1%) and 43 (97.7%) patients in the HF and CF groups, respectively. The mean age (± standard deviation) of patients receiving HF was 43.5 ± 4.5 years, and 39.3 ± 7.5 years for the CF group (p < 0.01). On univariate analysis, age greater than 40 years was associated with a higher likelihood of receiving HF WBRT (OR = 2.52, 95% CI 1.32-4.87), and patients with TN disease were 67% more likely to receive HF WBRT (OR = 0.33, 95% CI 0.13-0.87). No other differences were identified between the CF and HF groups, including receipt of systemic therapies.

Conclusions: Young women with early-stage BC treated with HF WBRT following BCS obtained excellent local control that was comparable to CF WBRT. At our institution, HF was more likely to be recommended for women over 40 years of age or for non-TN BC in this patient population. HF WBRT shortens total treatment time, is more convenient for patients and may be considered for women less than 50 years of age.

19 POPULATION-BASED ASSESSMENT OF RELATIONSHIP BETWEEN VOLUME OF PRACTICE AND OUTCOMES IN HEAD AND NECK CANCER PATIENTS
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Purpose: Recent literature has suggested that higher volumes of practice are associated with better survival outcomes for head and neck cancer (HNC) patients. Some limitations in these studies, however, include looking at the volume of practice on a cancer centre level, not a provider level, and not controlling for rurality of patient residence. The primary objective of this study was to evaluate the effect of treatment centre on the overall survival (OS) and cancer-specific survival (CSS) of HNC patients