BOOK OF ABSTRACTS

CAMO 2017 ANNUAL SCIENTIFIC MEETING

Thursday, April 27, 2017

Co-chair : Dr. Rosalyn Juergens
Co-chair : Dr. Krista Noonan
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Abstract #01_CAMO_2017
CETUXIMAB (CET) CLEARANCE AND SURVIVAL IN PATIENTS (PTS) WITH METASTATIC COLORECTAL CANCER (MCRC)
Di Maria Jiang, Hao-Wen Sim, Lillian L. Siu, Jeremy D. Shapiro, Geoffrey Liu, Timothy J. Price, Derek J. Jonker, Christos S. Karapetis, Andrew H. Strickland, Wenjiang Zhang, Mark Jeffery, Dongsheng Tu, Siobhan Ng, Sabe Sabesan, Jenny Shannon, Amanda Townsend, Eric Morgen, Wei Xu, Chris J. O’Callaghan and Eric X Chen

1 Division of Medical Oncology, Department of Medicine, University of Toronto, Toronto ON
2 Division of Medical Oncology and Hematology, Princess Margaret Cancer Centre, University Health Network, Toronto ON
3 Department of Medical Oncology, Cabrini Hospital, Cabrini Monash University, Melbourne, Australia
4 Department of Hematology and Oncology, Queen Elizabeth Hospital, CALHN, Adelaide, South Australia
5 Ottawa Hospital Research Institute, University of Ottawa, Ottawa ON
6 Flinders Medical Center, Flinders University, Adelaide, South Australia
7 Monash Cancer Centre, Monash University, Clayton, Australia
8 Canterbury Regional Cancer and Hematology Service Centre, Christchurch Hospital, Christchurch, New Zealand
9 Canadian Cancer Trials Group, Queen’s University, Kingston ON
10 Sir Charles Gairdner Hospital, Nedlands Australia
11 Townsville Hospital, Townsville, Australia
12 Nepean Cancer Care Centre, Kingswood, Australia
13 Department of Laboratory Medicine and Pathology, Mount Sinai Hospital, Toronto, ON
14 Department of Biostatistics, Princess Margaret Cancer Centre, Toronto ON.

BACKGROUND
Cet, a monoclonal antibody against EGFR, is a standard therapy for RAS wild-type (WT) mCRC. Limited data suggest a correlation between Cet clearance and progression-free survival (PFS). We performed a population pharmacokinetic (pop-pK) analysis of Cet in pts with KRAS WT mCRC who participated in the phase III NCIC CO.20 trial.

METHODS
Standard Cet doses ± brivanib (Briv) were administered. Intermittent blood samples were obtained and analyzed by ELISA. Pop-pK analysis was conducted to estimate Cet clearance. Pts were divided into quartiles according to clearance parameters to evaluate exposure-outcome with overall survival (OS), PFS, response rate (RR), and toxicity.

RESULTS
In 703 pt, Cet clearance was best described as a one-compartment model with a saturable elimination (defined by $V_{\text{max}}$ and $K_m$). Mean values (± standard deviation) were 5.6 ± 1.4 L for $V$, 10.5 ± 2.8 mg/h for $V_{\text{max}}$, and 403.1 ± 2.0 mg/L for $K_m$. $V_{\text{max}}$ and $K_m$ were significantly associated with OS, but not PFS or RR. Median OS for pts in the highest quartile of $V_{\text{max}}$ was 7.8 versus (vs.) 11.6 ms for pts in the lowest $V_{\text{max}}$ quartile (HR 1.12, $p<0.001$). In the highest $K_m$ quartile, median OS was 11.6 vs. 7.6 ms in the lowest $K_m$ quartile (HR 0.89, $p=0.001$). Pts with the lowest clearance parameters (lowest $V_{\text{max}}$ and highest $K_m$) had significantly longer OS (11.6 ms) compared to pts with the highest clearance (highest $V_{\text{max}}$ and lowest $K_m$) (7.6 ms) (HR 0.67, $p<0.001$), and experienced more grade 3 diarrhea (OR 0.23, $p=0.005$).

CONCLUSIONS
For KRAS WT mCRC, standard Cet dosing is not optimal for all pts. Pts with lower Cet clearance have longer OS and increased likelihood of grade 3 diarrhea. Further studies are needed to identify individual patient factors associated with Cet clearance, and to optimize dosing based on individual pk assessments.
INVESTIGATING GENETIC DETERMINANTS OF POOR RESPONSE TO ANDROGEN DEPRIVATION THERAPY (ADT) IN PATIENTS WITH METASTATIC PROSTATE CANCER USING CIRCULATING TUMOUR DNA (CTDNA)

Daniel Khalaf\(^1\), Matti Annala\(^2\), Martin E. Gleave\(^3\), Kevin Beja\(^3\), Gillian Vandekerkhove\(^3\), Alex Wyatt\(^3\), Kim N. Chi\(^3\)

\(^1\) Department of Medical Oncology, BC Cancer Agency, Vancouver, BC
\(^2\) Institute of Biosciences and Medical Technology, Tampere, Finland
\(^3\) University of British Columbia, Vancouver Prostate Centre, Vancouver, BC

OBJECTIVES

To determine whether known deleterious somatic (androgen receptor (AR) amplification, p53 inactivation, BRCA2 mutation and RB1 loss) and germline aberrations (HSD3β1 enzyme gain of function polymorphism, BRCA2 mutation), are associated with a short response to ADT.

METHODS

Deep sequencing of 73 prostate cancer-relevant genes was performed on plasma derived ctDNA samples obtained from 200 patients at time of diagnosis of metastatic castration-resistant disease. Records were retrospectively reviewed to determine time from ADT initiation to castration resistance as per Prostate Cancer Working Group 2 (PCWG2) criteria.

RESULTS

There were a total of 97 patients who commenced ADT in the setting of metastatic disease and for whom a reliable evaluation of time to castration-resistant prostate cancer (TTCRPC) could be made. The median TTCRPC for the entire cohort was 16.9 months. The incidence of homozygous and heterozygous status for the HSD3β1 polymorphism were 10% and 37% and did not predict for reduced TTCRPC (median 18.9 and 16.3 months vs 16.4 months for wild-type, \(p=0.92\)). The incidence of p53 mutations, RB1 deletion, AR amplification and BRCA2 mutations were 33%, 21%, 35%, and 10%, respectively. p53, RB1, and AR amplification were associated with shorter TTCRPC (see TABLE).

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<td>BRCA2</td>
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CONCLUSION

Patients with shorter than expected TTCRPC have an increased incidence of alterations in p53, RB1 and AR at progression with a similar trend for patients with BRCA2 mutation. Contrary to reports in the literature, we did not find an association between HSD3β1 enzyme status and TTCRPC. Understanding the genomic predictors of poor response to ADT has the potential to assist in stratifying patients to more intensive therapy.
Abstract #49_CAMO_2017

THE PEROXISOME PROLIFERATOR-ACTIVATED RECEPTOR Δ/β AGONIST GW501516 SYNERGIZES WITH INFLAMMATORY SIGNALS TO ENHANCE ADOPTIVE CELL THERAPY

Samuel Saibil1,3, Michael St. Paul1,2 and Pamela Ohashi1,2

1Tumor Immunotherapy Program, Princess Margaret Cancer Centre, Toronto, Ontario
2Department of Immunology, University of Toronto, Toronto, Ontario
3Division of Medical Oncology, Department of Medicine, University of Toronto, Toronto, Ontario

Adoptive cell therapy (ACT) has demonstrated tremendous promise for the treatment of metastatic melanoma. Memory CD8+ T cells are superior mediators of ACT than effector CD8+ T cells due to an superior ability to persist in vivo. A shift in cellular metabolism to fatty acid oxidation (FAO) underpins this in vivo persistence of memory CD8+ T cells. This switch to FAO requires the expression of the enzyme carnitine palmitoyl transferase 1a (CPT1a).

OBJECTIVE

To determine the impact of the peroxisome proliferator-activated receptor (PPAR)δ/β agonist GW501516 (GW), an agent known to boost CPT1a expression in other tissues, on CD8+ T cell metabolism, function and performance in a murine melanoma model.

METHODS

We utilized a mass spectrometry-based metabolomics approach and the Seahorse bioanalyzer to interrogate the metabolic phenotype of CD8+ T cells treated with GW. The anti-tumor ability of these cells was also assessed using the well-characterized B16F10-GP33 murine model of melanoma.

RESULTS AND CONCLUSIONS

GW treatment increased CPT1a expression in CD8+ T cells and also increased the abundance of multiple different acylcarnitines, consistent with enhanced FAO. Unexpectedly, T cells activated in the presence of GW as well as inflammatory signals, either LPS-matured dendritic cells (DCs) or IL-12, demonstrated enhanced production of interferon-γ. This increase in interferon-γ correlated with increased expression of the transcription factor T-bet. Despite the high T-bet expression, a characteristic of short-lived effector cells, GW-treated CD8+ T cells activated by LPS-treated DCs demonstrated an enhanced ability to persist in vivo. They also demonstrated improved performance in our murine model of ACT. Thus, combined treatment of CD8+ T cells with GW and inflammatory signals resulted in in Teff cells with improved ability to produce cytokines and increased FAO allowing for enhanced in vivo persistence. These data identify GW501516 as an attractive candidate for further studies and rapid translation into clinical trials of ACT.
Abstract #45_CAMO_2017
AN EXOME-WIDE ASSOCIATION STUDY OF PANCREATIC CANCER RISK
Robert C. Grant1, Robert E. Denroche2, Ayelet Borgida3, Carl Virtanen3, Natalie Cook3, Alyssa L. Smith3, Ashton A. Connor1, Malcolm Moore3, Mathieu Lemire1, George Zogopolous4, Lincoln Stein1, Steven Gallinger12.
1Ontario Institute for Cancer Research, Toronto, Ontario.
2Ontario Pancreas Cancer Study, Toronto, Ontario.
3Princess Margaret Genomics Centre, Toronto, Ontario.
4Research Institute of the McGill University Health Centre, Montreal, Quebec.

OBJECTIVE
Epidemiologic studies suggest that the genetic determinants of pancreatic cancer risk remain mostly undiscovered. In this study, we examined the contribution of germline coding variation.

METHODS
Exome and genome sequencing data from 437 cases with pancreatic adenocarcinoma and 1,927 controls, all Caucasian, were processed through a standardized bioinformatics pipeline. We performed an exome-wide association study with the primary analysis focusing on rare inactivating variants using an additive logistic regression model adjusting for age, gender, and population stratification. Power was estimated using a novel empirical “spike-in” procedure. Secondary analyses included an additive model of rare damaging variants, defined using the M-CAP classifier, the sequence-kernel association test, and an additive model for each individual nonsynonymous variant.

RESULTS
We identified 15,355 rare inactivating variants in 7,756 genes. Only BRCA2 was significantly enriched for rare inactivating variants (cases 17/437, controls 3/1927, adjusted p-value=3.26x10^{-6}). No gene was significantly enriched for rare damaging variants, although several had suggestive evidence, including UHMK1 (p=9.18x10^{-5}), FGFR3 (p=3.49x10^{-4}), EIF2AK1 (p=5.64x10^{-4}) and CHST6 (p=4.15x10^{-4}). Genes identified through a filter-based analysis were unlikely candidates based on comparison with controls in the association analysis. Using the sequence-kernel association test, TNFSF10 was significantly associated with pancreatic cancer risk (p=2.08x10^{-6}). No individual nonsynonymous variant had a significant association.

CONCLUSIONS
We demonstrated the feasibility of incorporating sequence data from multiple sources to perform association analyses, which reduced false-positives over traditional filter-based analyses. Our analysis suggests that BRCA2 is the only gene that causes many pancreatic cancers with high penetrance. We have identified several other candidate genes warranting further investigation. Larger collaborative efforts will be required to investigate noncoding variation and identify genes with smaller effect sizes or where variants are present in fewer cases.
Abstract #09_CAMO_2017

PRIMARY CARE VS. ONCOLOGY-DRIVEN SURVEILLANCE FOLLOWING ADJUVANT CHEMOTHERAPY IN RESECTED PANCREAS CANCER

Haider H Samawi1, Yaling Yin2, Howard J Lim1,3, Daniel J Renouf1,3, Winson Y Cheung1,3
1British Columbia Cancer Agency, Vancouver, British Columbia,
2Gastrointestinal cancers outcome unit, BC Cancer Agency, Vancouver, British Columbia
3Division of Medical Oncology, University of British Columbia, Vancouver, British Columbia

BACKGROUND

Major oncology societies outline different recommendations following curative intent treatment for pancreas cancer and this has resulted in wide variations in practice among institutions. We aim to describe patterns of surveillance and evaluate their impact on outcomes.

METHODS

A total of 147 adult patients who received at least one cycle of adjuvant chemotherapy with gemcitabine or 5-fluorouracil monotherapy at any of the British Columbia Cancer Agency centers between 2004 and 2015 were included in this analysis. Surveillance strategies were divided into two groups: discharged to primary care physicians (PCP) or follow up with oncologists that included regular clinical assessments, laboratory testing and/or diagnostic imaging.

RESULTS

Median age at diagnosis was 64 (range 38-85) years and 48% were men. More patients were followed by oncologists than PCP (66% vs. 44%). Among the measured prognostic factors, only patients with advanced tumor stage (T3/4) were more likely to be followed by cancer specialists (78% vs. 62%, P = 0.03), while age, gender, performance status, node status, pathologic grade and surgical margins were balanced between the two groups. In the entire cohort, 100 (68%) patients had a documented recurrence. Patient followed by oncologists were more likely to receive chemotherapy on recurrence than those followed by PCP (58% vs. 34%, respectively, P = 0.03). The median overall survival (OS) was 2.82 (95% CI 2.17-3.32) years in the oncology group and 3.35 (95% CI 2.85-5.06) years in the PCP group while the median relapse free survival (RFS) was 1.4 (95% CI 1.37-1.77) and 2.4 (95% CI 2.07-4.59) years, respectively. On multivariate analysis, there was no significant difference in OS between oncology and PCP-driven surveillance (HR 1.23; 95% CI 0.74-2.04, P = 0.4); however, RFS favored the PCP group (HR 1.62; 95% CI 1.01-2.56, P = 0.04, for oncology).

CONCLUSIONS

In this population-based analysis, surveillance tests and imaging performed by oncologists detected recurrences earlier when compared to follow up by PCPs, but this did not result in OS differences. PCPs may have a larger role in the follow up care of selected patients with resected pancreas cancer.
Abstract #23_CAMO_2017
IMMEDIATE-TERM CHEMOTHERAPY-RELATED COGNITIVE IMPAIRMENT (CRCI) FOLLOWING ADMINISTRATION OF INTRAVENOUS (IV) CHEMOTHERAPY

Omar F. Khan¹, Ellen Cusano², Soundouss Raissouni³, Mica Pabia, Johanna Haeseker, Nicholas Bosma⁴, Steven M. Yip¹, Jenny Ko⁵, Aalok Kumar⁵, Michael M. Vickers⁶, Patricia A. Tang⁷
¹Department of Oncology, University of Calgary, Calgary, Alberta, Canada
²Undergraduate Medical Education, University of Ottawa, Ottawa, Ontario, Canada
³Margery E. Yuill Cancer Centre, Medicine Hat, Alberta, Canada
⁴Department of Medicine, University of Calgary, Calgary, Alberta, Canada
⁵British Columbia Cancer Agency, British Columbia, Canada
⁶Department of Oncology, Ottawa Regional Cancer Centre, Ottawa, Ontario, Canada

OBJECTIVE
The acute impact of chemotherapy on cognition is unknown. This study utilized the psychomotor vigilance task (PVT) and trail-making test B (TMT) to assess CRCI immediately following chemotherapy administration.

METHODS
Patients aged 18-80 years receiving first-line IV chemotherapy for any stage of breast or colorectal cancer were eligible. Patients with brain metastases, neurologic disorders or allergic reactions to chemotherapy were excluded. Patient symptoms, peripheral neuropathy and Stanford Sleepiness Scale were assessed. A five-minute PVT and TMT were completed on a tablet computer pre-chemotherapy and immediately post-chemotherapy. Paired Wilcoxon Rank Sum tests were used to assess change in median PVT reaction time, TMT completion time, TMT errors and PVT lapses. A priori, an increase in median PVT reaction times by over 20 ms (approximating PVT changes with blood alcohol concentrations of 0.04-0.05 g%) was considered clinically relevant.

RESULTS
144 patients (74 breast, 70 colorectal, median age 55.5 years) were tested. Post-chemotherapy, median PVT reaction time slowed by an average of 12.4 ms ($p = 0.01$, Figure 1). Post-chemotherapy median PVT times slowed by over 20 ms in 59 patients (40.9%). TMT completion post-chemotherapy was faster by an average of 6.1 seconds ($p < 0.001$). No differences were seen in TMT errors ($p = 0.417$) or PVT lapses ($p = 0.845$). Change in median PVT reaction time was not associated with age, gender, number of prior chemotherapy cycles, use of paclitaxel (which contains alcohol), peripheral neuropathy, or self-reported anxiety, fatigue or depression.

CONCLUSIONS
Median PVT reaction time slowed significantly immediately after chemotherapy compared to a pre-chemotherapy baseline, and impairment correlating to alcohol consumption was seen in 41% of patients. This effect appears independent of age or self-reported symptoms. Further studies assessing functional impact of immediate-term CRCI are warranted.
Abstract #23_CAMO_2017 (continued)
IMMEDIATE-TERM CHEMOTHERAPY-RELATED COGNITIVE IMPAIRMENT (CRCI) FOLLOWING ADMINISTRATION OF INTRAVENOUS (IV) CHEMOTHERAPY

**Figure 1.** Waterfall plot of changes in median PVT reaction time in breast cancer (a) and colorectal cancer (b) patients, with positive changes representing slowed reaction times post-chemotherapy compared to a pre-chemotherapy baseline. The red dashed line represents a slowing of 20 ms, similar to PVT changes seen with blood alcohol concentrations approximating the legal driving limit.
Abstract #27_CAMO_2017

PREDICTION OF RELAPSE IN PATIENTS WITH LOCALLY ADVANCED BREAST CANCER AFTER NEOADJUVANT TREATMENT

Olexiy Aseyev1, Lisa Simmonds1, Maddie Gertler1, Susan Dent1 and Shailendra Verma1

1Department of Medicine (Division of Medical Oncology), University of Ottawa, Ottawa, ON, Canada

BACKGROUND
Despite advances in cancer treatment, over 25% of patients (pts) with locally advanced breast cancer (LABC) relapse during first 5 years after treatment.

OBJECTIVES
The primary objective was to construct a prediction tool for risk of relapse in patients with LABC after neoadjuvant therapy. Previously published works (Matsuda N. et al, 2014; Keam B. et al, 2011; Katz A. et al. 2008) have also examined this issue.

MATERIAL AND METHODS
This was single center, retrospective study of 546 patients with LABC who received neoadjuvant chemotherapy at the Ottawa Hospital Cancer Center between 2005 and 2015. Median follow-up was 49 months. The following data collected: demographics, tumor size, nodal and receptor status, grade, HER-2, stage of disease, cancer treatment and clinical outcomes. Primary endpoints were local and/or distant disease recurrence rate during first 5 years and time to relapse during the first 5 years. A prediction tool was devised based on the Cox regression model.

RESULTS
In 545 patients neoadjuvant chemotherapy was prescribed as follows: FEC-D – 91 (17%), AC-Docetaxel – 330 (60%), other regimens (AC, AC-Paclitaxel, TC, TCH) – 124 (23%). Breast conserving surgery was performed in 67 (12%) pts, mastectomy in 440 (81%) pts. Adjuvant radiotherapy was given in 485 (89%). All patients had trastuzumab – 173 pts (34%) for Her2-positive disease and endocrine therapy (tamoxifen and/or AI) – 356 (44%) pts – for endocrine-sensitive disease. Recurrence rate during first 5 years of follow up was 17.3% (local relapse – 3.2%, distant relapse – 13.2%, local + distant relapse – 0.9%).
Abstract #27_CAMO_2017 (continued)

PREDICTION OF RELAPSE IN PATIENTS WITH LOCALLY ADVANCED BREAST CANCER AFTER NEOADJUVANT TREATMENT

Over 60 variables were included in primary analysis. Cox regression proportional hazards model analysis resulted in only 5 factors with significant influence on risk of relapse during first 5 years of follow up. Risk factors and their risk prediction value are: 1) residual disease (yes- 4; no-0), (HR = 4.25; p-value=0.000), 2) lymph nodes status (positive-3; negative-0), (HR = 2.27; p-value=0.006), 3) Inflammatory histology (yes-2; no-0), (HR = 1.90; p-value=0.003) 4) estrogen receptors status (positive-2; negative-0), (HR = 2.07; p-value=0.001), 5) Adjuvant radiotherapy (yes-0; no-1), (HR = 1.76; p-value=0.036). When these factors are combined the following Relapse Prediction (RP) Score can be constructed:

<table>
<thead>
<tr>
<th>Score</th>
<th>Risk of relapse (5 years)</th>
<th>No of pts</th>
<th>Relapse (N of pts)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>(L=local, D=distant, LD=local+distant)</td>
</tr>
<tr>
<td>0-5</td>
<td>Low – 7%</td>
<td>153 (28%)</td>
<td>Censored: 77</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Analysed: 76</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L:3 (4%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D:27 (3%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L+D:0</td>
</tr>
<tr>
<td>6-7</td>
<td>Intermediate – 26%</td>
<td>220 (40%)</td>
<td>Censored: 96</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Analysed: 124</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L:5 (4%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D:27 (22%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L+D:0</td>
</tr>
<tr>
<td>8-12</td>
<td>High – 51%</td>
<td>172 (32%)</td>
<td>Censored: 59</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Analysed: 113</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L:9 (8%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>D:43 (38%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>L+D:5 (4.5%)</td>
</tr>
</tbody>
</table>

Internal validation of proposed model was performed. ROC analysis of the proposed model revealed a sensitivity of 75%. According to this simple RP score, patients can be classified into to three groups (RP score – 0-5; 6-7; 8-12). Risk of relapse was 7 times higher in patients with RP Score 8-12 vs patients with score 0-5 (p-value<0.0001).

CONCLUSIONS
Patients with LABC represent a heterogeneous group with diverse risk of disease recurrence. Our prognostic tool based on 5 risk factors can be used to predict risk of relapse after neoadjuvant treatment with a sensitivity of 75%. Patients with high risk may require additional treatment and/or more active follow-up strategies and this simple model may be used to design unique studies in LABC based on RP score. We intend to further validate this model on a larger multi center /provincial population.
Abstract #05_CAMO_2017

EGFR AND KRAS MUTATIONS IN ARCHIVAL TISSUE (ATDNA) AND CIRCULATING TUMOR DNA (CTDNA): THE IMPACT OF TUMOR HETEROGENEITY

Ying Wang1, Cheryl Ho1, Solomon Vandt1, Ian Bosdet2, Janessa Laskin1, Sophie Sun1, Barbara Melasky1, Ryan Morin3, Hagen Kennecke1, Aly Karsan2

1Department of Medical Oncology, University of British Columbia, Vancouver, British Columbia
2Centre for Clinical Genomics, Michael Smith Genome Sciences Centre, BC Cancer Agency, Vancouver, British Columbia
3Department of Molecular Biology and Biochemistry, Simon Fraser University, Vancouver, British Columbia

BACKGROUND

In NSCLC, ctDNA is a potential alternative to tissue biopsies in identifying targetable mutations. Individual ctDNA platforms have varying abilities to detect specific mutations. A prospective, multicenter study was conducted to determine concordance, sensitivity and specificity of ctDNA and atDNA genotyping.

METHODS

Patients with incurable advanced NSCLC at the BC Cancer Agency were enrolled over 14 months. Next-Generation Sequencing (NSG) and high-throughput multiplex amplification of a 27-gene panel (Raindance) was used for atDNA analysis. 4mL of plasma was collected in Streck (Cell Free DNA BCT) tubes for ctDNA genotyping using the Boreal Genomic OnTarget. Concordance, sensitivity and specificity was analyzed with atDNA as the reference standard.

RESULTS

76 patients were accrued. 26 EGFR mutations in 22 atDNA samples and 12 mutations in 11 ctDNA samples were detected, with a concordance of 78%, sensitivity of 39%, and specificity 98%. 1 EGFR T790M mutation was positive by ctDNA alone. 21 KRAS mutations in 21 atDNA samples were detected and, within this subgroup, 10 ctDNA samples had KRAS mutations with a concordance of 76%, sensitivity of 50%, and specificity of 80%. The interval between archival tissue and ctDNA collection, and time between treatment and ctDNA collection, did not significantly impact the rate of concordance (p>0.05).

CONCLUSION

Although the sensitivity is low, the OnTarget ctDNA analysis is specific in identifying clinically relevant EGFR mutations and has acceptable concordance rates between ctDNA and atDNA testing. Targetable EGFR and kras mutations were detected in ctDNA but not atDNA, which may reflect site of biopsy and tumor heterogeneity. Given the non-invasive nature of this test, positive results can be used to direct therapeutic decisions, especially accounting for clonal evolution overtime in detection of resistance mutations.
Abstract #18_CAMO_2017

EXTERNAL VALIDITY OF CLINICAL TRIALS IN METASTATIC MELANOMA

Davis Sam¹, Gillian Gresham², Kerry J. Savage², Joanna Vergidis³, Winson Cheung³

¹Faculty of Medicine, University of British Columbia, Vancouver, BC
²Department of Medical Oncology, BC Cancer Agency, Vancouver, BC
³Department of Oncology, University of Calgary, Calgary, AB

OBJECTIVE
We aimed to evaluate how clinical trial findings are applied in a population-based setting of cancer patients and the subsequent treatment outcomes.

METHODS
We constructed a retrospective cohort of patients with unresectable or metastatic melanoma diagnosed from 2013 to 2014 and referred to any British Columbia Cancer Agency centre. Based solely on eligibility criteria described in registration trials of vemurafenib (Vem) and ipilimumab (Ipi), we classified patients into trial eligible (TE) and ineligible (TI) and those treated [TE(+)] and untreated [TE(-)] with these agents. During the study period, Vem was approved for 1st line use in BRAF mutant patients and Ipi was funded for 2nd line use.

RESULTS
We identified 185 patients with known BRAF status for the Vem analysis and 114 patients for the Ipi analysis. Median ages at diagnosis were 64 and 59 years, respectively. Among them, 57% and 61% were men, and 89% and 88% were ECOG 0 to 1, respectively. Of the 86 BRAF mutant patients in the Vem cohort, 69% were TE of whom 86% were TE(+). In the Ipi cohort, 84% were TE of whom 66% were TE(+). Factors most frequently associated with non-treatment in pooled Vem and Ipi TE patients included comorbidities (41%), patient refusal (23%), and toxicities from prior treatments (14%). Compared to TI and TE(-) patients, TE(+) patients achieved the best survival (adjusted for age, gender, and ECOG) with Vem (HR 0.53, 95%CI 0.28-1.00) and Ipi (HR 0.33, 95%CI 0.13-0.83).

CONCLUSIONS
There was favourable uptake of new melanoma treatments, but a fair number of patients were considered TI. Non-use of novel agents in TE patients was infrequent and mainly due to patient factors, patient preferences, and concerns about toxicities, highlighting further opportunities to optimize real world effectiveness of these new therapies.
Abstract #42_CAMO_2017

RETROSPECTIVE ANALYSIS OF IPILIMUMAB-INDUCED DIARRHEA AND/OR COLITIS – A SINGLE CENTRE REVIEW

Marco AJ Iafolla¹, Gregory R Pond¹, Elaine McWhirter¹

¹Department of Medical Oncology, Juravinski Cancer Centre, McMaster University, Hamilton, Ontario

OBJECTIVE
Ipilimumab is an effective medication in advanced melanoma but can cause severe diarrhea and colitis. This study identified the rate of ipilimumab-induced diarrhea/colitis at the Juravinski Cancer Centre (JCC), its associated factors for development, overall survival (OS) and progression free survival (PFS).

METHODS
The Ontario Patient Information System was used to retrospectively identify all melanoma patients at the JCC who were treated with ipilimumab 3 mg/kg IV every 3 weeks (September 2012 to June 2016). Patient demographics, medical history, prior melanoma treatments, diagnosis of ipilimumab-induced diarrhea/colitis, interventions to treat the diarrhea/colitis, and OS and PFS were collected. Descriptive statistics summarized characteristics and outcomes. Kaplan-Meier methods estimated time to event outcomes. Cox regression evaluated whether markers were prognostic for time to diarrhea/colitis diagnosis.

RESULTS
71 patients were treated with ipilimumab at the JCC, of which 22 patients (31%) developed diarrhea/colitis of any Grade; 4 patients developed Grade 1, 5 patients Grade 2, 6 patients Grade 3, 3 patients Grade 4, and 4 patients had unclear Grade. 11 patients required prednisone 1-2 mg/kg and 2 patients required anti-TNF treatment to treat their diarrhea/colitis; 1 patient required colectomy due to perforation. 10 patients required treatment discontinuation due to diarrhea/colitis. Whole cohort median OS and PFS was 340 days (95% CI 205, 519) and 110 days (95% CI 91, 138), respectively. Univariate analysis showed that only inadequate hematologic function at time of first ipilimumab application was prognostic of diarrhea/colitis (HR = 6.42, 95% CI 1.44, 28.62; p = 0.015).

CONCLUSION
Our OS, PFS, and rate of all grade ipilimumab-induced diarrhea/colitis are similar to published data, however our rate of Grade > 2 is larger. Additional work is needed to identify risk factors for the development of this immune related adverse event.
Abstract #56_CAMO_2017

RATES OF TRASTUZUMAB-ASSOCIATED CARDIOTOXICITY IN HER2-POSITIVE BREAST CANCER PATIENTS AT A TERTIARY CANCER CENTRE

N Kumar Tyagi*, MBCh BAO, FRCP; R Arora¹, MD; ACR Partridge¹, BHSc(Hons); M Tharmabala¹, MBCh BAO, FRCP;
DP Leong¹, MBBS(Hons), MPH, PhD, FRACP, FESC;
SD Mukherjee¹,², Bsc, MD, MSc, FRCP;
SK Dhesy-Thind¹,³, MD, MSc, FRCP;
¹Department of Oncology, Division of Medical Oncology, McMaster University, Hamilton, Canada; ²Department of Medicine, Division of Internal Medicine, McMaster University, Hamilton, Canada; ³MD Program, Faculty of Medicine, University of Toronto, Toronto, Canada; ⁴Department of Medicine, Division of Cardiology, McMaster University, Hamilton, Canada; ⁵Department of Oncology, Division of Medical Oncology, Juravinski Cancer Centre, Hamilton, Canada; *first author

Human epidermal growth factor receptor 2 (HER2) is overexpressed in 15-25% of breast cancers and associated with decreased rates of survival. Trastuzumab is a humanised monoclonal antibody that binds against HER-2 and improves both disease free and overall survival in the adjuvant setting. A side effect of Trastuzumab is reversible cardiotoxicity, which can lead to early termination of Trastuzumab. The rates of Trastuzumab-associated cardiotoxicity seen in trials range between 1-16%. These rates may not be representative of clinical practice. Our aim is to identify the rate of Trastuzumab-associated cardiotoxicity and the rate of early discontinuation of Trastuzumab due to cardiotoxicity at the Juravinski Cancer Centre (JCC), in Hamilton, Ontario. Patients treated with adjuvant Trastuzumab between 2006-2013 at JCC were identified using JCC pharmacy data and included in this audit. We examined patient charts for relevant clinical-pathologic variables, cardiac risk factors, cardiotoxicity events/types, and number of Trastuzumab cycles completed. Cardiotoxicity was defined as decreased left ventricular ejection fraction (DLVEF) of ≥15%, DLVEF of >10% to under 50%, or a cardiac event that necessitated treatment delay/discontinuation. Results are shown in Table 1. Of 353 identified patients, 170(48.2%) had at least one known risk factor for cardiac disease. Cardiotoxicity was seen in 110(31.2%) patients. In conclusion, we found that rates of cardiotoxicity were higher at JCC than in clinical trials. This is not unexpected as patients with known cardiac risk factors and history of cardiac disease were excluded from most clinical trials. Strategies to optimize cardiac risk factors and management of cardiotoxicity are required. We have recently opened a cardio-oncology clinic at JCC and initiated a clinical trial examining the feasibility of ongoing Trastuzumab therapy in the setting of mild DLVEF.

<table>
<thead>
<tr>
<th>Events</th>
<th>n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed one year adjuvant Trastuzumab</td>
<td>232(65.7%)</td>
</tr>
<tr>
<td>Cardiotoxicity</td>
<td>110(31.2%)</td>
</tr>
<tr>
<td>Patients who suffered CT that were referred to cardiologist</td>
<td>22(20.0%)</td>
</tr>
<tr>
<td>DLVEF ≥15% or &gt;10% to under 50%</td>
<td>90(25.5%)</td>
</tr>
<tr>
<td>DLVEF ≥15%</td>
<td>71(20.1%)</td>
</tr>
<tr>
<td>Delay in treatment due cardiotoxicity</td>
<td>62(17.6%)</td>
</tr>
<tr>
<td>Discontinued early due to cardiotoxicity</td>
<td>52(14.7%)</td>
</tr>
</tbody>
</table>
Abstract #57_CAMO_2017

COMPARISON OF DC VS FEC-D ADJUVANT CHEMOTHERAPY IN HORMONE RECEPTOR POSITIVE AND TRIPLE NEGATIVE BREAST CANCER

Omar Khan1, Zachary Veitch1, Derek Tilley2, TruongMinh Pham2, Xanthoula Kostaras2, Patricia A. Tang1, Karen King3, Sasha Lupichuk1
1Department of Medical Oncology, Tom Baker Cancer Centre, University of Calgary, Calgary, AB
2CancerControl Alberta, Alberta Health Services, Calgary, AB
3Department of Medical Oncology, Cross Cancer Institute, University of Alberta, Edmonton, AB

OBJECTIVE
To compare survival outcomes for patients receiving DC vs FEC-D chemotherapy for node negative, single node positive, and triple negative breast cancers (TNBC).

METHODS
Patients with stage I-III, HER2- breast cancers receiving adjuvant DC or FEC-D chemotherapy were identified using the Alberta CancerControl EMR. Patients were stratified by hormone receptor expression (+/-) and nodal status (N0 vs N+1). Significant differences in disease-free survival (DFS) and overall survival (OS) were determined using log rank analysis.

RESULTS
A total of 2303 patients were included for analysis (FEC-D n = 1303; DC, n = 1000). Patient characteristics are listed in Table 1. In the ER+, node negative subgroup, no significant difference(s) in DFS (93% vs 87%; p = 0.077) or OS (91% vs 95%; p = 0.115) were seen for patients treated with DC or FEC-D respectively. In patients with 1 node positive, DFS was non-significant (p=0.149); however, OS did reach significance for superiority of DC (97%) vs FEC-D (93%; p = 0.037). In patients with node negative TNBC, no significant differences in DFS (p = 0.071) or OS (p = 0.312) were identified.

CONCLUSION
In subgroup analysis, node negative patients have similar outcomes with both DC and FEC-D chemotherapy. In patients with 1 node positive, OS was superior with DC chemotherapy yet no difference in DFS was identified. In triple negative, node negative breast cancer, no significant difference exists in survival regardless of chemotherapy type.

Table 1. Patient characteristics in a retrospective study comparing DC and FEC-D chemotherapy use across Alberta for Stage I-III, HER-2 negative breast cancer (n = 2303).

<table>
<thead>
<tr>
<th>Category</th>
<th>FEC-D Chemotherapy (n = 1303)</th>
<th>DC Chemotherapy (n = 1000)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
</tr>
<tr>
<td>Nodal Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>112</td>
<td>8.6</td>
<td>799</td>
</tr>
<tr>
<td>Positive</td>
<td>1191</td>
<td>91.4</td>
<td>185</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>0.0</td>
<td>16</td>
</tr>
<tr>
<td>Estrogen/Progesterone Receptor Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER+ and/or PR+</td>
<td>1109</td>
<td>85.1</td>
<td>820</td>
</tr>
<tr>
<td>ER- and PR-</td>
<td>194</td>
<td>14.9</td>
<td>180</td>
</tr>
<tr>
<td>Menopausal Status</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pre-menopausal</td>
<td>548</td>
<td>42.1</td>
<td>419</td>
</tr>
<tr>
<td>Post-menopausal</td>
<td>755</td>
<td>57.9</td>
<td>561</td>
</tr>
<tr>
<td>Unknown</td>
<td>0</td>
<td>0.0</td>
<td>20</td>
</tr>
<tr>
<td>Chemotherapy Dose Reduction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>572</td>
<td>43.9</td>
<td>700</td>
</tr>
<tr>
<td>85-100% dose</td>
<td>529</td>
<td>40.6</td>
<td>200</td>
</tr>
<tr>
<td>&lt; 85% dose</td>
<td>202</td>
<td>15.5</td>
<td>100</td>
</tr>
</tbody>
</table>
Abstract #58_CAMO_2017
ADJUSTMENTS IN RELATIVE DOSE INTENSITY (RDI) FOR ADJUVANT DC OR FEC-D CHEMOTHERAPY IN BREAST CANCER - A POPULATION BASED ANALYSIS
Zachary Veitch¹, Omar Khan¹, Derek Tilley², TruongMinh Pham², Xanthoula Kostaras², Patricia A. Tang¹, Karen King³, Sasha Lupichuk¹
¹Department of Medical Oncology, Tom Baker Cancer Centre, University of Calgary, Calgary, AB ²CancerControl Alberta, Alberta Health Services, Calgary, AB ³Department of Medical Oncology, Cross Cancer Institute, University of Alberta, Edmonton, AB

OBJECTIVE
Evaluate the effect of reductions in RDI for breast cancer (BC) patients receiving adjuvant DC or FEC-D chemotherapy with respect to disease-free (DFS) and overall survival (OS).

METHODS
Patients with stage I-III, ER +/-, HER2- BC receiving adjuvant chemotherapy were identified using the Alberta CancerControl EMR. RDI of chemotherapy for DC (4 cycle) and FEC-D (6 cycle) were recorded. Average RDI was stratified by >85% vs < 85% of total dose. Subgroup analysis for FEC-D early (FEC - cycle 1-3) versus late (D - cycle 4-6) average RDI adjustments were evaluated. Date of recurrence/death from any cause was identified.

RESULTS
Adjuvant regimens were evaluated independently for DC (n=1,000) and FEC-D (n=1,303) cohorts. For DC chemotherapy, average RDI adjustments <85% vs >85% did not result in significant differences in DFS (91% vs 93%; p=0.555) or OS (93% vs 95%; p=0.338). In the FEC-D cohort, patients receiving an average RDI <85% compared to >85% demonstrated a significant decline in both DFS (79% vs 85%; p=0.009) and OS (82% vs 89%; p=0.006). Early reductions in RDI compared to no reduction was correlated with inferior DFS (77% vs 86%; p=0.001) and OS (79% vs 90%; p<0.001). Comparative late reductions in RDI did not affect DFS/OS. Percentage ER/PR negative BC in <85% vs >85% arms were non-significant for DC or FEC-D cohorts (p=0.203).

CONCLUSION
For low risk BC receiving DC chemotherapy, dose reductions <85% are not correlated with decreased survival. Comparatively, high risk BC receiving FEC-D with average RDI <85% are significantly correlated with reduced DFS and OS. Early compared with late reductions in RDI are significantly correlated with DFS and OS. This suggests that where possible, early and total empiric dose reductions should be avoided in patients receiving adjuvant FEC-D chemotherapy for high risk BC.
Abstract #51_CAMO_2017

AGE SHOULD NOT BE A DETERRENT FOR ADJUVANT CHEMOTHERAPY IN PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER: A POPULATION-BASED REVIEW

Shiru Lucy Liu1, Pierre O’Brien1, Yizhou Zhao2, Wilma M Hopman3, Nathan Lamond1, Ravi Ramjeesingh1.

1Department of Medicine; 2Department of Radiation Oncology, Queen Elizabeth II Health Sciences Centre, Dalhousie University, Halifax, Nova Scotia, Canada
3Queen’s University, Kingston, Ontario, Canada

BACKGROUND

Little is known about the benefit and utilization of adjuvant chemotherapy (ADJ) in the elderly population (age ≥65) with locally advanced rectal cancer (LARC). We therefore undertook a provincial review of LARC patients to evaluate the potential benefits (including overall survival and time to relapse) of ADJ in the elderly population.

METHODS

We performed a retrospective analysis of 286 LARC patients (stage 2 and 3) diagnosed between January 2010 and December 2013 from Nova Scotia who underwent curative-intent surgery. Baseline patient, tumor and treatment characteristics were collected. Survival and time to relapse analysis were performed using Kaplan-Meier and Cox-regression statistics.

RESULTS

152 patients were age ≥65, with 92 age≥70. Median follow-up was 45.8 months. 178 patients (62%) received neoadjuvant chemotherapy plus radiation (NEOADJ). While 109 patients (81%) age <65 received ADJ, only 68 patients (45%) age ≥65 received ADJ. Kaplan-Meier analysis revealed a significant survival and time to relapse advantage for ADJ irrespective of age (table 1). In cox-regression multivariate analysis, ECOG status, T-stage, and ADJ were significant predictors of survival (p<0.04), while age was not. Similarly, N-stage, NEOADJ, and ADJ were significant predictors of time to relapse (p<0.007). Poor ECOG status and surgical complications were the most common causes of adjuvant treatment omission. There was a significantly higher amount of chemotherapy-related toxicity (grade≥ 1) experienced by patients age≥65 treated with ADJ compared to no ADJ (77% vs 32%, p=0.0001), which consisted mostly of diarrhea and mucositis. Toxicity was the main reason for non-completion of ADJ treatment in the elderly population.

CONCLUSION

Elderly patients with LARC have significantly improved overall survival with ADJ, but the use of ADJ is lower than in patients age<65. However, elderly population experience more chemotherapy-related toxicities, leading to higher rates of early treatment discontinuation.

TABLE 1: Survival and TTR stratified by age with or without adjuvant chemotherapy

<table>
<thead>
<tr>
<th>Age Group</th>
<th>N</th>
<th>5-year OS (%)</th>
<th>Cancer Specific Survival (%)</th>
<th>N</th>
<th>Time to Relapse (mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;65 (-) Adjuvant Chemo</td>
<td>24</td>
<td>70.8</td>
<td>71.4</td>
<td>25</td>
<td>34.2</td>
</tr>
<tr>
<td>(+) Adjuvant Chemo</td>
<td>109</td>
<td>86.2</td>
<td>90.3</td>
<td>109</td>
<td>49.9</td>
</tr>
<tr>
<td>P=0.0757</td>
<td></td>
<td>p=0.0276</td>
<td></td>
<td></td>
<td>p=0.0026</td>
</tr>
<tr>
<td>65 - 69 (-) Adjuvant Chemo</td>
<td>17</td>
<td>58.8</td>
<td>62.5</td>
<td>19</td>
<td>35.7</td>
</tr>
<tr>
<td>(+) Adjuvant Chemo</td>
<td>41</td>
<td>90.2</td>
<td>94.6</td>
<td>41</td>
<td>46.1</td>
</tr>
<tr>
<td>P=0.0099</td>
<td></td>
<td>p=0.0074</td>
<td></td>
<td></td>
<td>p=0.094</td>
</tr>
<tr>
<td>≥70 (-) Adjuvant Chemo</td>
<td>65</td>
<td>52.3</td>
<td>45.4</td>
<td>64</td>
<td>23.1</td>
</tr>
<tr>
<td>(+) Adjuvant Chemo</td>
<td>27</td>
<td>88.9</td>
<td>87.5</td>
<td>27</td>
<td>49.7</td>
</tr>
<tr>
<td>P=0.0008</td>
<td></td>
<td>p=0.0087</td>
<td></td>
<td></td>
<td>p&lt;0.001</td>
</tr>
</tbody>
</table>
Abstract #13_CAMO_2017
CHEMOTHERAPY CHEMOTHERAPY FOR RESECTED COLORECTAL CANCER PULMONARY METASTASES: UTILIZATION AND OUTCOMES IN ROUTINE CLINICAL PRACTICE

Safiya Karim1,2, Sulaiman Nanji2,3, Kelly Brennan1, C.S. Pramesh5, Christopher M. Booth1,2,4
1 Division of Cancer Care and Epidemiology, Queen’s University Cancer Research Institute Departments of Oncology2, Surgery3, and Public Health Sciences4, Queen’s University, Kingston, Canada
2 Department of Surgical Oncology, Tata Memorial Centre, Mumbai, India

BACKGROUND
The role of chemotherapy in the setting of resected colorectal cancer pulmonary metastases (CRCPM) is not well defined. Here we describe utilization of peri-operative chemotherapy and outcomes among patients with resected CRCPM in the general population.

METHODS
All cases of CRCPM who underwent resection from 2002-2009 were identified using the Ontario Cancer Registry (OCR). Electronic treatment records identified peri-operative chemotherapy delivered within 16 weeks before or after pulmonary metastectomy (PM). Modified Poisson regression was used to evaluate factors associated with chemotherapy delivery. Cox proportional models were used to explore the association between post-operative chemotherapy and cancer-specific (CSS) and overall survival (OS).

RESULTS
The study population included 420 patients. Thirty-six percent of patients (151/420) received peri-operative chemotherapy. Among these patients, 75% (113/151) received post-operative chemotherapy. Factors that were independently associated with use of post-operative chemotherapy included higher socioeconomic status (SES) and no prior adjuvant chemotherapy (p<0.01). In adjusted analyses post-operative chemotherapy was not associated with improved CSS (HR 0.99, 95% CI 0.67-1.47) or OS (HR 0.93 95%CI 0.66-1.31). In exploratory analyses, among those patients who did not receive previous adjuvant therapy for the primary colorectal cancer, post-operative chemotherapy following lung metastatectomy was associated with HR 0.50 (95%CI 0.27-0.95) for OS and HR 0.59 (95%CI 0.27-1.27) for CSS.

CONCLUSIONS
One third of patients with resected CRCPM in routine practice receive peri-operative chemotherapy. A randomized controlled trial is warranted to evaluate whether chemotherapy following resection of CRCPM is associated with improved survival.
Abstract #15_CAMO_2017
HYPERGLYCEMIA AND SURVIVAL IN SOLID TUMORS: A SYSTEMATIC REVIEW AND META-ANALYSIS
Reeta Barua1, Arnoud J Templeton2, Bostjan Seruga3, Alberto Ocana4, Eitan Amir1,5, Josee-Lyne Ethier5
1Department of Medicine, University of Toronto, Toronto, Canada
2Department of Medical Oncology, St. Clarapital Basel and Faculty of Medicine, University of Basel, Basel, Switzerland
3Department of Medical Oncology, Institute of Oncology Ljubljana, Zaloška cesta 2, SI - 1000 Ljubljana, Slovenia
4Albacete University Hospital, Albacete, Spain; GEICAM, Madrid, Spain
5Division of Medical Oncology and Hematology, Princess Margaret Cancer Centre and Department of Medicine, University of Toronto, Toronto, Canada

BACKGROUND
Diabetes is associated with adverse cancer outcomes. However, the effect of hyperglycemia independent of diabetes is unclear. Here we report on a meta-analysis exploring the effect of hyperglycemia on outcomes of solid tumors, and the influence of clinical factors on this association.

METHODS
A systematic search of electronic databases identified publications exploring the effect of hyperglycemia on overall (OS), disease-free (DFS) or progression-free survival (PFS). Definitions of hyperglycemia (fasting blood glucose, random blood glucose or HbA1c) and cut-offs varied between studies. Data from studies reporting a hazard ratio (HR) and 95% confidence interval (CI) or a p-value were pooled in a meta-analysis using generic inverse-variance and random effects modeling. Subgroup analyses were conducted based on method of hyperglycemia measurement (HbA1c, other) and tumor stage (early, advanced, mixed). Meta-regression was performed to evaluate the influence of clinical characteristics on the HR for OS. All statistical tests were two-sided.

RESULTS
Eight studies comprising a total of 4342 patients were included. All studies reported HRs for OS. Two studies reported DFS outcomes, and two reported PFS. Hyperglycemia was associated with worse OS (HR 2.07, 95% CI = 1.70 - 2.52; P < 0.001) and DFS (HR 1.61, 95% CI = 1.04 - 2.49; P < 0.001), but did not decrease PFS (HR 1.08, 95% CI = 0.72 - 1.62; P = 0.71). The association with worse OS was maintained in subgroups based on method of hyperglycemia measurement (subgroup difference P = 0.65) and tumor stage (P = 0.62). Meta-regression analyses did not identify any factors significantly altering the magnitude of association between hyperglycemia and OS (see Table).

CONCLUSIONS
Hyperglycemia is associated with adverse OS and DFS in patients with cancer, and the therapeutic role of optimal glycemic control warrants further investigation.

<table>
<thead>
<tr>
<th>Variable</th>
<th>β Coefficient</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overall Survival</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Median age</td>
<td>0.34</td>
<td>0.504</td>
</tr>
<tr>
<td>Female sex</td>
<td>0.50</td>
<td>0.316</td>
</tr>
<tr>
<td>Metastatic disease</td>
<td>0.22</td>
<td>0.776</td>
</tr>
<tr>
<td>Known diabetes</td>
<td>0.39</td>
<td>0.340</td>
</tr>
<tr>
<td>Hypoglycemic medication*</td>
<td>0.59</td>
<td>0.597</td>
</tr>
<tr>
<td>Glucose modifying medication**</td>
<td>0.36</td>
<td>0.636</td>
</tr>
</tbody>
</table>

* Includes oral hypoglycemics and insulin
** Includes steroids, oral hypoglycemics and insulin
Abstract #32_CAMO_2017
COMPARING THE USE OF NEOADJUVANT ENDOCRINE THERAPY TO CHEMOTHERAPY IN ER-POSITIVE BREAST CANCER: RESULTS FROM A PROSPECTIVE INSTITUTIONAL DATABASE
Nathalie LeVasseur¹, Walter Yip², Huaqi Li², Caroline Illman¹, Miranda McDermott¹, Christine Simmons²
¹Department of Medical Oncology, British Columbia Cancer Agency, Vancouver, British Columbia
²University of British Columbia, Vancouver, British Columbia

BACKGROUND
The utilization of neoadjuvant endocrine therapy (NET) remains an area of controversy for the treatment of women with estrogen-receptor (ER) positive, HER-2 negative breast cancer. Rates of down-staging in the non-trial population remain unknown and real world outcomes comparing NET to neoadjuvant chemotherapy (NACT) have not been consistently described.

METHODS
A prospective institutional database of 600 breast cancer patients treated with neoadjuvant therapy between 2012 and 2016 was analyzed. All patients with ER positive, HER2 negative breast cancer were selected. Patients were then divided into two groups: those who received NET or NACT. Baseline characteristics and demographics were compared between groups. A matched analysis was then performed to compare the rate of pCR and downstaging. Independent-sample t tests, Pearson’s Chi-square test and multiple linear regression models were applied for statistical analysis.

RESULTS
From 2012-2016, a total of 154 patients met eligibility criteria for this study. Forty-eight patients (31%) received NET and 106 (69%) received NACT. Patients treated with NET were significantly older (64 vs 51yrs, 95%CI 9.76-17.72) than those offered NACT and presented with a lower clinical stage (LR 27.93, p=0.002). According to multiple linear regression, clinical stage followed by NACT were the most important predictors of down-staging. When matched for age and stage, down-staging was significantly higher with NACT (31/48, 65%) as compared to NET (12/48, 25%), (X² (1) = 15.207, p<0.001). Of these, 1 patient (2.1%) achieved pCR with NET as compared to 6 (12.5%) with NACT, LR 4.243, p=0.039.

CONCLUSION
NACT remains the preferred modality for neoadjuvant therapy for breast cancer. When matched for age and clinical stage, greater proportions of down-staging and pCR were observed with NACT compared to NET. Rates of pCR remain low for ER-positive breast cancers and long-term outcomes with the use of neoadjuvant therapy in the non-trial setting are lacking.
Abstract #35_CAMO_2017

OUTCOMES IN ADVANCED UROTHELIAL CANCER AND THE ROLE OF NEUTROPHIL-TO-LYMPHOCYTE RATIO (NLR) IN THE SECOND-LINE TREATMENT SETTING

Steven Yip¹, Jeenan Kaiser¹, Haocheng Li², Scott North², Daniel Heng¹, Nimira Alimohamed¹

¹ Tom Baker Cancer Centre, Department of Oncology, University of Calgary, Calgary, AB
² Cross Cancer Institute, Department of Oncology, University of Alberta, Edmonton, AB

OBJECTIVE
We investigated real world outcomes in this patient population and evaluated the prognostic role of the neutrophil to lymphocyte ratio (NLR) in the second-line treatment setting.

METHODS
A retrospective analysis was performed on 233 patients with advanced UC treated with systemic therapy in Alberta between 2005-2015. Overall response rates (ORR), overall survival (OS), and time to treatment failure (TTF) were calculated. Cox regression analysis was performed to examine the association between baseline NLR (low NLR<3 vs high NLR≥3) and TTF and OS in the second-line.

RESULTS
In the first-line setting, 130/233 (56%) patients were treated with a cisplatin combination regimen, and 87/233 (37%) received carboplatin/gemcitabine. The ORR was 25% (59/233), with an additional 16% (37/233) of patients achieving stable disease (SD). Median OS was 9.1 mo (95% CI 8.1 – 10.2), while TTF was 6.9 mo (95% CI 4.6 – 9.5). 79/233 patients (34%) were treated with second-line systemic therapy. In the second-line, an ORR of 22% (17/79) was observed; 24% (19/79) achieved SD. Low baseline NLR prior to second-line therapy was significantly associated with improved median TTF at 7.9 months (95% CI 3.5 – not reached), versus 3.6 months for patients with high NLR (95% CI 2.3 – 7.1) (p=0.029). Low baseline NLR in the second-line was also significantly associated with a longer median OS of 12.2 months (95% CI 8.1 – 21.0), in comparison to 6.8 months in patients with high NLR (95% CI 4.8 – 8.3) (p=0.003). 23/233 patients (10%) received third-line treatment.

CONCLUSION
In this real world analysis of advanced UC patients treated with systemic therapy, first-line outcomes were lower than expected, while response rates in the second-line compared favourably to the literature, suggesting a highly selected patient population actually receives second-line treatment. A low baseline NLR in the second-line is associated with improved TTF and OS, and warrants further evaluation.

Figure 1: NLR at the start of second-line systemic therapy and overall survival
POSTER PRESENTATION (RESIDENTS/FELLOWS)

Abstract #46_CAMO_2017
WHOLE GENOME SEQUENCING (WGS) ANALYSIS OF LUNG ADENOCARCINOMA: ELUCIDATING THE MOLECULAR SIGNATURE

Negar Chooback¹, Cheryl Ho¹, Yaoqing Shen¹, Erica Tsang¹, Yongjun Zhao², Andrew Mungall², Richard Moore², Howard Lim¹, Daniel Renouf¹, Karen Gelmon¹, Stephen Yip¹, Steven J.M. Jones², Janessa Laskin¹, Marco Marra².

¹Department of Medical Oncology, British Columbia Cancer Agency, Vancouver, British Columbia.
²Canada's Michael Smith Genome Sciences Centre, British Columbia Cancer Agency, Vancouver, British Columbia.

OBJECTIVE
The objective of our study was to compare Personalized OncoGenomics (POG) WGS identified single nucleotide variant (SNV) frequencies in lung adenocarcinomas (LUAD) with the TCGA (The Cancer Genome Atlas) LUAD database. The goal was to identify novel mutations and correlate with clinical characteristics.

METHODS
Patients with advanced LUAD and survival > 6 months were eligible. Blood, archival and fresh tumour specimens were subjected to comprehensive DNA sequencing at an average depth of 40X. SNVs that resulted in amino acid changes were identified. The findings were compared to the TCGA-LUAD cohort using the cBioPortal platform. Clinical characteristics were collected by chart review.

RESULTS
DNA mutation analysis of 30 LUAD was performed. Baseline characteristics: 47% female, median age 60, 57% never/light smokers, biopsy site - 50% lung, 50% metastatic lesion. 43% had targetable drivers (5 EGFR, 6 ALK, 1 RET, 1 ROS1). Mutations in genes with expectedly high mutations rates were comparable to the TCGA-LUAD cohort (Table 1). Four genes (GOLGA6L2, FAM186A, ARMCX4 and RBMXL3), were mutated 17-27% of the time in POG patients, while the rate in TCGA-LUAD was <1%. GOLGA6L2 was more commonly mutated in men. TP53 and KRAS were more commonly mutated in smokers. No other correlations with clinical factors were identified.

<table>
<thead>
<tr>
<th>GENE</th>
<th>POG Mutation Frequency</th>
<th>TCGA-LUAD Mutation Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>TP53</td>
<td>50%</td>
<td>47%</td>
</tr>
<tr>
<td>TTN</td>
<td>43%</td>
<td>46%</td>
</tr>
<tr>
<td>RYR2</td>
<td>33%</td>
<td>39%</td>
</tr>
<tr>
<td>KRAS</td>
<td>23%</td>
<td>36%</td>
</tr>
<tr>
<td>NF1</td>
<td>17%</td>
<td>13%</td>
</tr>
</tbody>
</table>

CONCLUSION
While common oncologic mutations were found in similar rates in our cohort and TCGA-LUAD, four genes GOLGA6L2, FAM186A, ARMCX4 and RBMXL3 were identified as mutations of potential interest. The molecular signature of NSCLC is complex and involves multiple key oncogenic drivers.
OBJECTIVE
In the context of the clinical and biological evidence of inhaled corticosteroid (ICS) use in lung cancer prevention, we hypothesized that ICS exposure in patients with lung cancer may impact survival.

METHODS
We conducted a retrospective cohort study of lung cancer patients in Manitoba, Canada and analyzed the effect of ICS exposure on overall mortality. Using population-based datasets, we identified all patients with lung cancer between 2004 and 2010. Information extracted included age, sex, histological subtype, stage at diagnosis, date of diagnosis, and date of death. We defined exposure to ICS as more than 60-day supply with no longer than a 3-month gap between prescriptions. Exposure to ICS was categorized into seven mutually exclusive groups based on duration and timing of exposure. Cox regression models were constructed to determine the effects of exposure on survival.

RESULTS
A total of 5721 patients were identified. The majority were male, between the ages of 65-79 years, and had stage III or IV disease. Of these, 1574 (27.5%) were exposed to ICS. Compared to the unexposed, two groups had improved survival in multivariable analysis: those with continuous exposure starting within 2 years prior to diagnosis (HR 0.86 p=0.018) and those exposed within 6-months post-diagnosis (HR 0.80 p=0.039). In stratified analysis, this survival advantage was limited to stage III and IV disease. Survival was significantly worse in those exposed to ICS but stopped pre-diagnosis (HR 1.56 p=0.0001).

CONCLUSIONS
In this retrospective cohort study, we identified that ICS exposure in patients with lung cancer was associated with mortality. The effect appears to depend on both the timing and duration of exposure.
Abstract #39_CAMO_2017
THE PULSES PROJECT: TEACHING THE VITAL ELEMENTS OF CODE STATUS DISCUSSIONS TO ONCOLOGY RESIDENTS
Oren Levine1, Ines Menjak2, Stephanie Brule3, Meghan McConnell4, Sukhinder Dhesy-Thind1, Som Mukherjee1, Melissa Brouwers1
1Department of Oncology, McMaster University, Hamilton, Ontario
2Department of Medical Oncology, University of Toronto, Toronto, Ontario
3Department of Medical Oncology, The Ottawa Hospital, Ottawa, Ontario
4Department of Anesthesiology, University of Ottawa, Ottawa, Ontario

OBJECTIVES
Discussions with cancer patients around cardiopulmonary resuscitation (CPR), or ‘code status,’ are often led by trainees in oncology, but formal education for this competency is lacking. In this study, we developed and tested a novel communication tool, the PULSES framework for informed code status decision-making (a six-step approach summarized by the PULSES acronym), through an educational workshop.

METHODS
A multicentre randomized controlled trial was carried out at 3 academic cancer centres in Ontario, Canada. Residents in medical oncology (MO) and radiation oncology (RO) programs completed a workshop and an observed structured clinical exam (OSCE). Participants were randomized to complete the training before the OSCE (experimental arm), or after the OSCE (control arm). Randomization was stratified for centre and oncology discipline. Expert raters evaluated communication with a novel rating tool (the PULSES scale) and a validated benchmark tool, the communication skills assessment form (CSAF) which is not specific to oncology content. The primary outcome was improvement in PULSES scores.

RESULTS
Forty-six residents consented to participate (28 RO and 18 MO). Groups were well-balanced for program and year of training. Participants in the experimental group had higher mean PULSES score than those in the control group (80.4±13.5 vs 63.4±9.7; p<.001; maximum score = 108). There was no significant effect for program and no significant interaction between program and training condition. Scores for the PULSES and CSAF scales were highly correlated (R = 0.864).

CONCLUSIONS
The PULSES training improved performance among oncology residents for code status discussions. Improved communication scores were not scale-specific. The PULSES framework offers a standardized approach and can be incorporated into competency-based curricula for postgraduate oncology programs. Future work will explore electronic teaching formats and whether communication training in this area impacts patient-level outcomes.
Abstract #60_CAMO_2017

THE USE OF CHEMOTHERAPY IN THE ELDERLY WITH STAGE II AND III COLON CANCER: VARIATION BY AGE AND ERA OF DIAGNOSIS

Susan Green¹,², David Dawe¹,², Zoann Nugent², Winson Cheung³, and Piotr Czaykowski¹,².

¹ Department of Internal Medicine, University of Manitoba, Winnipeg, MB.
² Department of Medical Oncology and Hematology, CancerCare Manitoba, Winnipeg, MB.
³ Department of Medical Oncology, BC Cancer Agency, Vancouver, BC.

Objective
To examine the use of adjuvant chemotherapy for stage II/III colon cancer in the elderly.

METHODS
Using the Surveillance, Epidemiology, and End Results (SEER)-Medicare database, we analyzed patients aged 66 or greater, diagnosed with stage II/III colon cancer between 1991 and 2007 who received curative surgery. Using Medicare claims, receipt of adjuvant chemotherapy (defined as within 6 months of surgery) was identified, and compared between age bands (66-69, 70-74, 75-79, 80-84, 85-89 and 90+) and between time frames (1991-1995, 1996-1999, 2000-2007). Cox regression analysis was performed to assess determinants of receipt of adjuvant chemotherapy.

RESULTS
A total of 31,990 patients were identified: 4371 age 66-69, 6922 (70-74), 7673 (75-79), 6807 (80-84), 4266 (85-89), and 1951 (90+). The proportion of females increased from 51% to 76% between the 66-69 and 90+ age cohorts. The percent receiving adjuvant chemotherapy decreased by age cohort - 57% in those 66-69, 48% (70-74), 37% (75-79), 20% (80-84), 1% (85-89), and 1% (90+). Stage III disease was a significant predictor of receipt of chemotherapy (p<0.01) in every age band, with the exception of the 90+ age group. There was no difference between era of diagnosis (1991-1999 versus 2000+), with the exception of the 85-89 age group, who were more likely to receive chemotherapy in year 2000 or later (p<0.01). Mortality decreased with the use of adjuvant chemotherapy in every age band (p<0.01), with the exception of the 90+ age group.

CONCLUSION
Patients are less likely to receive adjuvant chemotherapy for stage II/III colon cancer with advancing age, but improved outcomes with adjuvant treatment are observed up to age 90 years in this cohort.
Abstract #02_CAMO_2017

PHASE 2 TRIAL OF CAPECITABINE PLUS ERLOTINIB VERSUS CAPECITABINE ALONE IN PATIENTS WITH ADVANCED COLORECTAL CANCER

Daniel Breadner1,2, Stephen Welch1,3, Denis Soulieres4, Michael Sanatani1,3, Paul Klimo5, Mary J. MacKenzie1,3, Frances Whiston3, Larry Stitt3, Anne O’Connell1, Mark D. Vincent1,3

1Department of Medicine, Schulich School of Medicine and Dentistry, London, Ontario, Canada
2London Regional Cancer Program, London, Ontario, Canada
3Department of Oncology, Schulich School of Medicine and Dentistry, London, Ontario, Canada
4Centre Hospitalier de l’Université de Montréal, Montreal, Quebec, Canada
5Medical Oncology, Lions Gate Hospital, North Vancouver, British Columbia, Canada

BACKGROUND
Capecitabine monotherapy as palliation for aCRC is generally well tolerated by elderly or unfit patients. Whether epidermal growth factor receptor (EGFR) TKIs might improve efficacy of capecitabine alone in patients not appropriate for combination chemotherapy, is unknown. We conducted a randomized phase 2 trial investigating the novel combination of capecitabine and erlotinib in these patients.

METHODS
Between 2004 and 2008, 82 elderly or unfit patients who were deemed inappropriate for, or chose against 1st-line combination chemotherapy were enrolled randomized to capecitabine alone (Arm 1: 40 pts) or capecitabine with erlotinib (Arm 2: 42 pts). Primary endpoint was time to disease progression (TTP); secondary endpoints included objective response rate (ORR), safety, and overall survival (OS). Tumours were designated as left-sided if there were distal to the transverse colon. KRAS status, where possible, was retrospectively analyzed for 72 of 82 pts.

RESULTS
Median TTP for arm 2 was 9.2 months versus 7.9 months for arm 1 (P=0.89). KRAS-WT patients on arm 2 experienced a trend towards greater TTP (median 11.7 months vs 8.4 months on arm 1, P=0.449). Conversely, patients with KRAS mutations had significantly worse median TTP when treated in arm 2 versus arm 1, 1.9 months to 7.4 months (P=0.023). Arm 2 KRAS-WT patients with left-sided primary masses had a non-significant improvement in OS (16.0 vs. 12.1 months) compared to patients with right-sided tumours.

CONCLUSIONS
The addition of erlotinib to capecitabine increased TTP by 3.2 months in KRAS-WT pts, although this difference was not statistically significant. This study suggests that erlotinib harms patients with KRAS-mutated aCRC while it may provide benefit to those with KRAS-WT CRC. Further study of EGFR-TKIs in patients with KRAS-wild-type CRC, with left-sided primary tumours, is warranted.
Abstract #16_CAMO_2017

OUTCOMES OF WOMEN WITH SMALL, EARLY-STAGE BREAST CANCER IN MANITOBA FROM 2006-2011

Hanbo Zhang1, Pascal Lambert2, Aly-Khan Lalani1, Katherine Fradette2, Rashid Ahmed2, Debjani Grenier1, Marshall Pitz1

1Department of Medical Oncology, University of Manitoba, Winnipeg, MB
2CancerCare Manitoba, Winnipeg, MB

OBJECTIVES

The objectives were to describe the distribution, molecular phenotypes, management, and long-term outcomes of women with early-stage breast cancer (T1mic/T1a/T1b N0 M0) in Manitoba from 2006-2011.

METHODS

Using the Manitoba Cancer Registry, we created a retrospective cohort of patients with primary breast cancer of 1.0 cm or less, between 2006 and 2011. Data included patient demographics, tumour size, treatment modalities (surgery, radiotherapy, chemotherapy and trastuzumab), estrogen-receptor (ER) and progesterone-receptor (PR) status, and human epidermal growth factor receptor 2 (HER2) status. Node-positive cancers were excluded. Patient outcomes were evaluated, including rates of recurrence and overall survival. Kaplan-Meier curves were used to illustrate overall survival, and cumulative incidence curves were used to illustrate recurrence.

RESULTS

Our study included 733 women. Mean age at diagnosis was 62. ER/PR positivity and HER2 positivity (HER2+) were 84% and 8.9%, respectively. Tumours were: T1mic 14.0%, T1a 19.1%, and T1b 66.9%. 98% of patients had surgery, 60% had adjuvant radiation, 3.8% received trastuzumab, and 11% received chemotherapy. The hazard ratio (HR) for disease recurrence for patients with HER2+ versus HER2- status was 4.313 (95% CI, 2.18 to 8.50; P=0.0001), and the HR for overall survival was 1.627 (95% CI, 0.72 to 3.67; P = 0.2402). The HR for disease recurrence in HER2+ patients receiving trastuzumab versus HER2+ patients who did not receive trastuzumab was 1.916 (95% CI, 0.61 to 5.97; P=0.2621).

CONCLUSIONS

Small, early-stage breast cancers are common and a significant proportion of patients recur. HER2-positivity appears to be an important risk factor for recurrence.

In our small cohort, treatment with trastuzumab did not appear to reduce the risk of recurrence. This may be due to small sample size, or selection bias in which patients with higher risk cancers received trastuzumab.
Abstract #28_CAMO_2017

COMPARISON OF 5-FU VS CAPECITABINE IN COMBINATION WITH MITOMYCIN OR CISPLATIN IN THE TREATMENT OF ANAL CANCER

Irene S. Yu¹, Winson Y. Cheung¹
¹Medical Oncology, BC Cancer Agency, Vancouver, BC

OBJECTIVES
The patterns of capecitabine use as an alternative fluoropyrimidine to infusional 5-FU in the non-operative management of anal cancer in the real world are poorly described. Our objectives were to 1) determine the frequency of capecitabine use, 2) compare the difference in outcomes, and 3) examine the difference in treatment-related adverse events between oral and intravenous fluoropyrimidines.

METHODS
All anal cancer patients who received either capecitabine or infusional 5-FU as part of their chemoradiotherapy treatment from 2004 to 2013 at any 1 of 6 comprehensive cancer centers in BC were included in this retrospective analysis. Chi-square and Wilcoxon-Mann tests were used to assess for associations between treatment groups and clinical characteristics and outcomes.

RESULTS
A total of 486 patients were included (Table 1). Baseline characteristics were balanced between the two groups with respect to age, gender, ECOG, and HIV status (all p>0.05). Overall, 155 (32%) patients identified within the study period received capecitabine. Prior to 2010, only 5-FU was utilized; from 2010-2013, 155 vs 82 patients (32% vs 17%) received capecitabine vs 5-FU, respectively. Comparing patients who received capecitabine vs 5-FU, overall (68% vs 67%, p=0.831) and disease-free survival rates (59% vs 59%, p=0.926) at 3 years were similar. Rates of subsequent APR were also similar (10% vs 14%, p=0.164). Patients who received 5-FU were more likely to report adverse effects (76% vs 57%, p<0.01). The capecitabine group had a lower incidence of stomatitis (7% vs 43%, p<0.01) whereas the 5-FU cohort reported less frequent hand-foot syndrome (1% vs 7%, p<0.01). The rates of myelosuppression, nausea/vomiting, diarrhea, and rash were similar between the two groups (all p>0.05).
Abstract #28_CAMO_2017 (continued)

COMPARISON OF 5-FU VS CAPECITABINE IN COMBINATION WITH MITOMYCIN OR CISPLATIN IN THE TREATMENT OF ANAL CANCER

CONCLUSION

This population-based study demonstrates a growing preference for capecitabine use in place of 5-FU in the management of anal cancer. Survival outcomes are similar between the two treatment groups, but capecitabine may be better tolerated.

Table 1: Baseline Patient Characteristics

<table>
<thead>
<tr>
<th>Age</th>
<th>Count/Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 65</td>
<td>146/486 (30.0%)</td>
</tr>
<tr>
<td>&lt; 65</td>
<td>340/486 (70.0%)</td>
</tr>
<tr>
<td>Median age</td>
<td>59 (IQR 53-67)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Count/Total (%)</th>
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<tbody>
<tr>
<td>Female</td>
<td>311/486 (64.0%)</td>
</tr>
<tr>
<td>Male</td>
<td>175/486 (36.0%)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>ECOG</th>
<th>Count/Total (%)</th>
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<tr>
<td>0</td>
<td>167/486 (34.4%)</td>
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<tr>
<td>1</td>
<td>251/486 (51.6%)</td>
</tr>
<tr>
<td>2</td>
<td>49/486 (10.1%)</td>
</tr>
<tr>
<td>3</td>
<td>18/486 (3.7%)</td>
</tr>
<tr>
<td>4</td>
<td>1/486 (0.2%)</td>
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</table>

<table>
<thead>
<tr>
<th>HIV status</th>
<th>Count/Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negative</td>
<td>456/486 (93.8%)</td>
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<tr>
<td>Positive</td>
<td>30/486 (6.2%)</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Total Radiation Dose</th>
<th>Median dose/Range</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>54 cGy (IQR 50.0-54.0)</td>
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</table>

<table>
<thead>
<tr>
<th>Initial Colostomy</th>
<th>Count/Total (%)</th>
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</thead>
<tbody>
<tr>
<td>No</td>
<td>439/486 (90.3%)</td>
</tr>
<tr>
<td>Yes</td>
<td>47/486 (9.7%)</td>
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</tbody>
</table>
Abstract #29_CAMO_2017
ELIMINATION OF SECOND-HAND SMOKE (SHS) EXPOSURE AFTER A LUNG OR HEAD AND NECK (HN) CANCER DIAGNOSIS AND SUBSEQUENT PATIENT SMOKING CESSATION
Lawson Eng\textsuperscript{1}, Devon Alton\textsuperscript{1}, Yuyao Song\textsuperscript{1}, Delaram Farzanfar\textsuperscript{3}, Olivia Krys\textsuperscript{1}, Tom Yoannidis\textsuperscript{1}, Robin Milne\textsuperscript{1}, Steven Habbous\textsuperscript{1}, M Catherine Brown\textsuperscript{1}, Ashlee Vennettilli\textsuperscript{1}, Frances A. Shepherd\textsuperscript{1}, Natasha B. Leigh\textsuperscript{1}, Andrew J. Hope\textsuperscript{1}, Doris Howell\textsuperscript{2}, Jennifer M. Jones\textsuperscript{2}, Peter Selby\textsuperscript{3}, Wei Xu\textsuperscript{1}, David Paul Goldstein\textsuperscript{1,2}, Meredith E Giuliani\textsuperscript{1}, Geoffrey Liu\textsuperscript{1}
\textsuperscript{1}Princess Margaret Cancer Centre, University Health Network, Toronto, ON; \textsuperscript{2}Toronto General Hospital, University Health Network, Toronto, ON; \textsuperscript{3}Centre for Addiction and Mental Health, Toronto, ON

OBJECTIVE
Exposure to SHS after a cancer diagnosis is associated with continued smoking in lung and HN cancer patients (PMID: 24419133, 23765604). However, smoking is a social activity. We evaluated whether elimination of SHS exposure around and after a diagnosis of either cancer is associated with smoking cessation in the cancer patient.

METHODS
Lung and HN cancer patients from Princess Margaret Cancer Centre (2006-12) completed questionnaires at diagnosis and follow-up (median 2 years apart) assessing smoking history and SHS exposures (cohort study). Multivariate logistic regression analysis evaluated the association of elimination of SHS exposure after diagnosis with subsequent smoking cessation, adjusted for significant covariates. A cross-sectional study (2014-2015) of 183 lung and HN patients assessed consistency in associations.

RESULTS
For the cohort study, 261/731 lung and 145/450 HN cancer patients smoked at diagnosis; subsequent quit-rates were 69% and 50% respectively. 91% of lung and 94% of HN cancer patients were exposed to SHS at diagnosis; while only 40% (lung) and 62% (HN) were exposed at follow-up. Elimination of SHS exposure was associated with smoking cessation in lung (aOR=4.76, 95%CI[2.56-9.09], P<0.001), HN (aOR=5.00 [1.61-14.29], P<0.001), and combined cancers (aOR=5.00 [3.03-8.33], P<0.001). The cross-sectional study has similar cessation and SHS exposure rates and a similar association for elimination of SHS with smoking cessation (aOR=3.42[1.16-10.10], P=0.03). However when asked directly, only 26% of patients quit smoking with another individual.

CONCLUSIONS
Elimination of SHS exposure around patients is significantly associated with smoking cessation in lung and HN cancer patients, but few patients quit smoking with others around them despite the ‘teachable moment’ with a cancer diagnosis. Clinicians should encourage patients and their household/friends to quit smoking together to improve overall cessation rates.
Abstract #33_CAMO_2017
BASELINE EDMONTON SYMPTOM ASSESSMENT SCALE (ESAS) AND SURVIVAL IN METASTATIC RENAL CELL CARCINOMA (MRCC)
Jeffrey Graham\textsuperscript{1}, Piotr Czaykowski\textsuperscript{1}, Joel Gingerich\textsuperscript{1}
\textsuperscript{1}University of Manitoba and CancerCare Manitoba, Winnipeg, Manitoba, Canada

BACKGROUND
We hypothesized that symptom burden (measured with the Edmonton Symptom Assessment Scale (ESAS), a patient reported, validated, and reliable tool measuring symptom severity in nine separate domains) might yield prognostic information in patients receiving treatment for mRCC, and might add to the existing prognostic models.

METHODS
We conducted a retrospective cohort study of patients receiving first-line sunitinib therapy for mRCC at CancerCare Manitoba between January 2008 and January 2012, and who had a baseline ESAS score. Baseline variables obtained included pretreatment summation ESAS scores (added together across all 9 domains) and information relevant to the preexisting prognostic models. We used Kaplan Meier survival analysis as well as Cox proportional hazards regression modeling to determine if symptom burden (ESAS scores) can provide prognostic information with regard to overall survival.

RESULTS
We identified a total of 68 patients receiving first line therapy for mRCC. The majority were male, had a median age of 64 years, and had intermediate or poor risk disease based on both the Memorial Sloan-Kettering Cancer Center (MSKCC) and the International Metastatic Database Consortium (IMDC) models. The median baseline summation ESAS score was 16 (range 6 – 35). In univariate analysis, the hazard ratio (HR) for mortality was 1.270 (p = 0.0047) per 10 unit increase in summation ESAS. In multivariable analysis, the HR was 1.208 (p = 0.0362) when controlling for MSKCC risk group and 1.240 (p = 0.019) when controlling for IMDC risk group.

CONCLUSIONS
We identified that the baseline symptom burden measured by ESAS scores can provide prognostic information regarding survival in patients receiving first line sunitinib for mRCC, and can add independent prognostic information to the existing MSKCC and IMDC models.
Abstract #36_CAMO_2017
MANAGING THE FUTURE UTILIZATION OF MEDICAL ONCOLOGY SERVICES: A WORKFORCE PLANNING MODEL
Steven Yip1, Shaun K Loewen1, Haocheng Li2, Jay Easaw2
1 Tom Baker Cancer Centre, Department of Oncology, University of Calgary, Calgary, AB
2 Cross Cancer Institute, Department of Oncology, University of Alberta, Edmonton, AB

OBJECTIVE
We developed a workforce-planning model to estimate the future projected Canadian medical oncologist (MO) supply and clinical demand over the next 10 years.

METHODS
MO supply was estimated using the Canadian Institute for Health Information and Canadian Medical Association 2005-2015 data, as well as the 2005-2014 Canadian Post MD Education Registry data. Canadian Cancer Statistics data from 2005-2016 and Alberta Cancer Registry data were used to estimate the number of new patients per MO, as well as systemic treatment utilization. A forward calculation model was created based upon these sources to forecast the balance of MO supply and demand dynamics. The Royal College Medical Oncology Committee is currently assessing the model’s face validity.

RESULTS
The MO workforce is expected to grow by 53.4% from 541 to 830 staff from 2016 to 2026, respectively. Over this period, new MO hires will increase from 39/year to 56/year, while retirements and departures will rise from 15/year to 24/year. Although cancer incidence rates are expected to grow by 32.2%, the projected increase in MO supply will mean fewer consultations, from 180/year/MO in 2016 to 155/year/MO in 2026. The initiation of patients on systemic therapy is projected to decrease from 89 systemic therapy starts/year/MO to 77 starts/year/MO.

CONCLUSIONS
We have developed a Canadian MO workforce model, which will be further validated and refined to incorporate more cancer prevalence data, while adjusting for MO full-time equivalent workload. The preliminary results suggest that new patient visits and systemic therapy starts will decrease for the average MO in the future. MO supply may outpace clinical demand over the next 10 years. However, longer life expectancies for treated patients and increasing treatment complexity, due to novel targeted therapies and immunotherapies, suggest that overall MO patient load may shift from more new consultations to more patient follow-up visits.

Table 1: Future Medical Oncology Supply and Demand Rates

<table>
<thead>
<tr>
<th>Year</th>
<th>MO workforce</th>
<th>New MO Hires</th>
<th>MO Departures &amp; Retirements</th>
<th>Annual New Cancer Incidence in Canada</th>
<th>New Patient Consults (per MO)</th>
<th>Systemic Treatment Starts (per MO)</th>
<th>New Patient Consults (per MO per month)</th>
<th>Systemic Treatment Starts (per MO per month)</th>
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</thead>
<tbody>
<tr>
<td>2016</td>
<td>541</td>
<td>39</td>
<td>15</td>
<td>202469.2</td>
<td>180.35</td>
<td>88.97</td>
<td>15.03</td>
<td>7.41</td>
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<tr>
<td>2017</td>
<td>566</td>
<td>41</td>
<td>16</td>
<td>208206.4</td>
<td>177.26</td>
<td>87.46</td>
<td>14.77</td>
<td>7.29</td>
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<tr>
<td>2018</td>
<td>593</td>
<td>43</td>
<td>16</td>
<td>214106.2</td>
<td>173.99</td>
<td>85.85</td>
<td>14.5</td>
<td>7.15</td>
</tr>
<tr>
<td>2019</td>
<td>619</td>
<td>44</td>
<td>18</td>
<td>220173.2</td>
<td>171.41</td>
<td>84.56</td>
<td>14.28</td>
<td>7.05</td>
</tr>
<tr>
<td>2020</td>
<td>647</td>
<td>46</td>
<td>18</td>
<td>226412.2</td>
<td>168.64</td>
<td>83.21</td>
<td>14.05</td>
<td>6.93</td>
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<tr>
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<td>48</td>
<td>19</td>
<td>232827.9</td>
<td>165.96</td>
<td>81.91</td>
<td>13.83</td>
<td>6.82</td>
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<tr>
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<td>705</td>
<td>49</td>
<td>20</td>
<td>239425.4</td>
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<td>80.74</td>
<td>13.64</td>
<td>6.73</td>
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<tr>
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<td>21</td>
<td>246209.9</td>
<td>161.41</td>
<td>79.65</td>
<td>13.45</td>
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<tr>
<td>2024</td>
<td>767</td>
<td>53</td>
<td>21</td>
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<td>159.06</td>
<td>78.49</td>
<td>13.26</td>
<td>6.54</td>
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<td>2025</td>
<td>798</td>
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<td>2026</td>
<td>830</td>
<td>56</td>
<td>24</td>
<td>267738.7</td>
<td>155.45</td>
<td>76.69</td>
<td>12.95</td>
<td>6.39</td>
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Abstract #37_CAMO_2017
UTILITY OF SARCOPENIA, SKELETAL MUSCLE ATTENUATION (SMA), AND WEIGHT LOSS IN PATIENTS (PTS) WITH RESECTABLE ESOPHAGEAL AND GASTROESOPHAGEAL JUNCTION (GEJ) CANCER RECEIVING PREOPERATIVE CHEMORADIOTHERAPY (CRT)
Arthur Lui, Andrea Gallivan, Marco Iofalla, Zainab Abdelaziz, Sunita Ghosh, Jennifer Spratlin, Karen Mulder, Michael Sawyer
Department of Medical Oncology, Cross Cancer Institute, University of Alberta, Edmonton, AB

INTRODUCTION
Abnormal body composition (sarcopenia, low SMA and weight loss of ≥ 8 % (WL)) has been associated with poor outcomes. This study evaluated sarcopenia, low SMA, and WL as factors associated with toxicity from neoadjuvant CRT and shorter overall survival (OS) in pts with resectable esophageal/GEJ cancer.

METHODOLOGY
We retrospectively reviewed all pts with resectable esophageal/GEJ cancer treated with curative intent preoperative CRT (paclitaxel/carboplatin) from 2010-2013. Pretreatment CT scans were used to measure skeletal muscle index (SMI) to determine sarcopenia and SMA. WL was determined from the first dietitian recorded body weight and pre-morbid body weight. Treatment delays/modifications (TDM) were used as surrogates for toxicity.

RESULTS
Of 89 pts, 77 (87%) were males; mean age of 61 years. Histology includes: 73 (82%) adenocarcinoma; 13 (15%) squamous cell carcinoma, 3 (3%) others. Sarcopenia, low SMA, and WL were present in 36 (40%), 45 (51%) and 43 (48%) pts, respectively. By univariate analysis, sarcopenia (p=0.009) and WL (p=0.012) were associated with shorter OS but low SMA did not reach statistical significance (p=0.636). Low SMA was also associated with TDM (p=0.001); sarcopenia (p=0.493) and WL (p=0.55) showed trends towards TDM. On multivariate analysis, only sarcopenia remained to be independently associated with shorter overall survival (p=0.005), independent of stage and performance status (PS).

CONCLUSION
Sarcopenia is associated with shorter OS independent of stage and PS. Low SMA is also associated with treatment-related toxicities. These results highlight the prognostic and predictive utility of body composition analysis in survival and treatment related toxicities in esophageal and GEJ cancer patients treated with curative intent preoperative CRT.
Abstract #55_CAMO_2017

DOES FERTILITY PRESERVATION IN BREAST CANCER PATIENTS AFFECT CANCER RECURRENCE RATES?

Ying Wang 1, Shaina Lee 2, Pierre Camateros 3, Kirstin Perdrizet 4, Daniel Yokom 1, Ellen Warner 2, Jeffery Roberts 2, Caroline Lohrisch 1

1 Department of Medical Oncology, British Columbia Cancer Agency, Vancouver, British Columbia
2 Department of Obstetrics and Gynecology, University of British Columbia, Vancouver, British Columbia
3 Department of Medicine, University of British Columbia, Vancouver, British Columbia
4 Department of Medical Oncology, University of Toronto, Toronto, Ontario
5 Department of Medical Oncology, Sunnybrook Health Sciences Centre, Toronto, Ontario

OBJECTIVE
Chemotherapy and hormone therapy results in potential ovarian toxicity and delay in child-bearing among women of reproductive age with breast cancer. Whether short term ovarian stimulation is safe is not well studied. We examined the effects of short-term ovarian stimulation on patients' breast cancer recurrence rates.

METHODS
Women diagnosed with localized breast cancer between 2005 and 2011 at any one of five cancer centres and referred to a reproductive endocrinologist in British Columbia were identified from a central database. Clinical, pathological, treatment, and outcome characteristics were compared for patients who did and did not undergo ovarian stimulation prior to systemic cancer treatment.

RESULTS
Seventy-seven patients were included: median age was 33, all were ECOG 0/1, 31 (40%) had lymph node involvement, 62 (81%) had estrogen receptor (ER) positive disease, and 18 (23%) had HER2 positive disease. Thirty-four (44%) women underwent ovarian stimulation: they were more likely to receive chemotherapy than patients who declined ovarian stimulation (p = 0.001). Age, number of existing children, radiation, and hormonal treatments were not significantly associated with decision to undergo ovarian stimulation (p > 0.05). After a median follow-up of 3.7 years, 7 (21%) patients who pursued ovarian stimulation and 9 (21%) patients who did not experienced disease recurrence. There was no association between ovarian stimulation and rate of local or distant breast cancer recurrence (p = 0.658).

CONCLUSIONS
We did not find a harmful effect of short term ovarian stimulation on breast cancer recurrence rates. Limitations include short follow-up, a small sample size, and few relapses. Patients who received chemotherapy were more likely to pursue ovarian stimulation, suggesting that patients were well informed about the negative impact on fertility of chemotherapy and of the importance of fertility preservation prior to potentially gonado-toxic treatments.
Abstract #03_CAMO_2017

PHASE II TRIAL OF DOSE REDUCED CAPECITABINE IN ELDERLY PATIENTS WITH ADVANCED COLORECTAL CANCER

Daniel Breadner1,2, Stephen Welch1,3, Derek Jonker4, Paul Klimo5, Christine Cripps4, James Biagi6, Wendy Lam7, Frances Whiston3, Larry Stitt3, Mark D. Vincent1,3

1Department of Medicine, Schulich School of Medicine and Dentistry, London, Ontario, Canada
2London Regional Cancer Program, London, Ontario, Canada
3Department of Oncology, Schulich School of Medicine and Dentistry, London, Ontario, Canada
4Ottawa Hospital Cancer Centre, Ottawa, Ontario, Canada
5Continuum Medical Care, Vancouver, British Columbia, Canada
6Cancer Centre of Southeastern Ontario, Kingston, Ontario, Canada
7Burnaby Hospital Regional Cancer Centre, Burnaby, British Columbia, Canada

BACKGROUND

Combination chemotherapy results in improved outcomes in trials of selected fit patients with advanced colorectal cancer (aCRC). For older, or less fit patients, combination chemotherapy is associated with greater toxicity and less benefit. Capecitabine monotherapy is a reasonable option for these patients but the optimal dosing remains controversial.

METHODS

A multicentre phase I/II trial of reduced dose capecitabine (Xeloda) 2000mg/m\(^2\) d1–14 q21d was conducted in 221 patients in one or more of the following subsets: age≥65 years, ECOG performance status ≥1, elevated LDH, prior pelvic radiation. Patients with prior pelvic radiation received 1500mg/m\(^2\) based on phase I results.

RESULTS

Median age was 72 years. A median 5 and mean 8 cycles were given (range 0 to 50). Grade 3/4 toxicity occurred in 25% of patients during the first 3 cycles (8.1% hand-foot syndrome, 7.7% diarrhea). Response rate was 13.6%, with 69.7% disease control rate. Median PFS was 5.6 months. Post progression 56 patients received further capecitabine monotherapy (median of 4 additional cycles). Median overall survival for all patients is 14.3 months. Median survival was significantly higher for baseline ECOG 0 vs. ≥1 and normal vs. elevated LDH.

CONCLUSIONS

This report suggests dose reduced capecitabine has less toxicity compared to historical full dose capecitabine, with only a small tradeoff in efficacy seen as a lower ORR. Its improved tolerability may lead to an increased number of cycles of therapy, and the PFS appears consistently higher at the lower dose. This should be viewed as compelling evidence in the absence of a head to head clinical trial that 2000, or even 1500 mg/m\(^2\), is an appropriate dose in elderly or frail patients with aCRC.
Abstract #22_CAMO_2017

THE IMPACT OF SYMPTOMS AT METASTATIC RECURRENCE ON TREATMENT OUTCOMES FOR PATIENTS UNDER SURVEILLANCE FOR EARLY-STAGE MELANOMA

Melanie Le May1, Andrea Marie Ibrahim2, Mark Bryanton3, Carolyn Nessim4, Xinni Song5, Michael Ong5
1Division of Internal Medicine, University of Ottawa, Ottawa, Ontario
2Cancer Therapeutics Program, Ottawa Hospital Research Institute, Ottawa, Ontario
3Division of Nuclear Medicine, University of Ottawa, Ottawa, Ontario
4Division of General Surgery, University of Ottawa, Ottawa, Ontario
5Division of Medical Oncology, University of Ottawa, Ottawa, Ontario

OBJECTIVE

We investigated whether asymptomatic detection of metastases impacts patient outcomes on novel systemic therapies such as immune-checkpoint inhibitors (ICI; anti-PD1 and/or anti-CTLA4) and targeted therapies (TT; BRAF and/or MEK inhibitors).

METHODS

Included in this study were all patients referred to The Ottawa Hospital Cancer Centre between January 1st, 2006-January 1st, 2016 with histologically-confirmed AJCC Stage I-III malignant melanoma, who developed metastatic melanoma within 5 years of diagnosis, and had systemic treatment with ICI and/or TT. Patients were coded for clinically-asymptomatic versus symptomatic detection of metastatic recurrence, and patient outcomes were analyzed by univariate testing (t-test, Chi-squared) and for survival outcomes (Kaplan-Meier analysis).

RESULTS

We identified 77 patients meeting the inclusion criteria who were subsequently treated with ICI (94%) and/or TT (26%). Patients with symptomatic metastases (43%) had a longer average CT/PET-CT imaging interval (8.3 vs 5.3 months, p=0.003), a longer time from last scan free of metastases (8.9 vs 7.4 months, p=0.013), and a longer time from start of surveillance to metastatic detection (21.7 vs 19.0 months, p=0.014) compared with asymptomatic patients (57%). There were no significant differences in baseline AJCC staging. Metastases were mainly detected by CT or PET-CT (82%). Amongst ICI treated patients, those with asymptomatic metastatic recurrence had superior radiological response (PR 26.8% vs 13.3%, CR 19.5% vs 16.7%) and survival outcomes (median 21.8 vs 10.2 months, p=0.025) than patients with symptomatic recurrence.

CONCLUSIONS

Superior treatment outcomes with ICI were observed for patients diagnosed with metastases in an asymptomatic state. Patients with symptomatic recurrence had less frequent cross-sectional imaging and a longer time to metastatic detection than asymptomatic patients, suggesting that further research should be done on intensification of early-stage melanoma surveillance to optimize patient outcomes.
Abstract #54_CAMO_2017

STRATEGIES FOR BUILDING RESILIENCY IN MEDICAL ONCOLOGY TRAINEES AND MEDICAL ONCOLOGY ATTENDING PHYSICIANS

Suzana Gilmour, Walter Yip, Miranda McDermott, Huaqi Li, Caroline Illmann, Christine Simmons
Department of Medical Oncology, British Columbia Cancer Agency, Vancouver, BC

OBJECTIVE

Burnout amongst oncologists is reported at approximately 45%. To account for this, oncologists likely develop skills over the course of their careers to foster resiliency. We identified strategies employed by oncology trainees and oncologists to show mechanisms that can be used to build resiliency at various stages of an oncologist’s career.

METHODS

Qualitative interviews were conducted across Canada with medical oncology trainees and attending staff using semi-structured, open ended questions in keeping with validated qualitative methodology. The interviews were transcribed and coded by three independent reviewers. Interviews were conducted until no further themes emerged. The themes were recorded and differences between the trainees and staff were assessed.

RESULTS

Seventeen interviews were conducted, 8 with trainees (PGY-4-7) and 9 with medical oncologists. Key themes were identified that promoted resiliency in the workplace and at home (See table 1). Self-reflection and positivity were helpful strategies for both trainees and staff in promoting resiliency both within and outside of work. Trainees and staff differed with respect to the nature of strategies employed to overcome or prevent burnout. Trainees tended towards concrete thinking with specific solutions for promoting resiliency such as exercising, taking time off or talking to a colleague. Staff, on the other hand, tended to utilize intrinsic skills based on self-reflection and experience. This transition from concrete to abstract strategies may reflect a previously unrecognized process of evolution for building resiliency in junior staff.
Abstract #54_CAMO_2017 (continued)

STRATEGIES FOR BUILDING RESILIENCY IN MEDICAL ONCOLOGY TRAINEES AND MEDICAL ONCOLOGY ATTENDING PHYSICIANS

CONCLUSION
Using qualitative methods we identified key areas to help prevent burnout and promote resiliency in oncologists in early to late career. While previous studies have commented on high rates of burnout in oncologist, this is the first study focused on identifying methods promoting resiliency. Themes identified provide a focus and target for organizations and point to differences between trainees and staff.

Table 1:

<table>
<thead>
<tr>
<th>Workplace related aspects promoting resiliency</th>
<th>Trainee</th>
<th>Medical Oncologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Being involved in patient care</td>
<td></td>
<td>Positive interactions with patients</td>
</tr>
<tr>
<td>Positive workplace culture</td>
<td></td>
<td>Positive workplace culture</td>
</tr>
<tr>
<td>Being a mentee</td>
<td></td>
<td>Being a mentor</td>
</tr>
<tr>
<td>Recognition</td>
<td></td>
<td>Being a mentee</td>
</tr>
<tr>
<td>Taking part in research or teaching</td>
<td></td>
<td>Recognition/being rewarded for good work</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Taking part in research or teaching</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Workplace related aspects promoting burnout</th>
<th>Trainee</th>
<th>Medical Oncologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Breaking bad news to patients</td>
<td></td>
<td>Breaking bad news to patients</td>
</tr>
<tr>
<td>Lack of control</td>
<td></td>
<td>Lack of control</td>
</tr>
<tr>
<td>Increased workload</td>
<td></td>
<td>Increased workload</td>
</tr>
<tr>
<td>Call expectations</td>
<td></td>
<td>Systems/workplace culture</td>
</tr>
<tr>
<td>Pressured to complete research projects</td>
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<table>
<thead>
<tr>
<th>Non-workplace related aspects promoting resiliency</th>
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<th>Medical Oncologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spending time with friends and family</td>
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<td>Spending time with friends and family</td>
</tr>
<tr>
<td>Hobbies and personal time</td>
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<td>Hobbies and personal time</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategies employed</th>
<th>Trainee</th>
<th>Medical Oncologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tangible</td>
<td></td>
<td>Abstract</td>
</tr>
<tr>
<td>• Exercising</td>
<td></td>
<td>• Self-reflection</td>
</tr>
<tr>
<td>• Going out with friends</td>
<td></td>
<td>• Reflecting on colleagues’ experiences</td>
</tr>
<tr>
<td>• Discussing cases/issues with colleagues</td>
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<td></td>
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</tbody>
</table>
Abstract #63_CAMO_2017

INCLUSION OF OLDER ADULTS IN CANADIAN CANCER TRIALS GROUP (CCTG) LED TRIALS – A RETROSPECTIVE ANALYSIS FROM 1990 TO 2015

Catalina Hernandez1, Winson Cheung2, Chris O’Callaghan4, Tim Ramsay3, Tina Hsu3
1. Department of Medicine, Division of Medical Oncology, Ottawa General Hospital, Ottawa, Canada
2. Department of Oncology, Tom Baker Cancer Center, University of Calgary, Calgary, Alberta, Canada
3. Ottawa Hospital Research Institute, University of Ottawa, Ottawa, Ontario, Canada
4. National Cancer Institute of Canada Clinical Trials Group, Kingston, Ontario, Canada

BACKGROUND

Older adults (OA) age 65+ make up 60% of all newly diagnosed cancers. However, only 22-32% of OA in cooperative group studies in the 1990s were age 65+. Clinical trial design, in particular the presence of strict exclusion criteria, has been cited as a major barrier to accrual of OA.

The objective of this study was to determine: 1) whether there has been an improvement in accrual of OA to clinical trials led by the Canadian Cancer Trials Group (CCTG) with time; 2) whether clinical trial design has changed with time; 3) whether changes in clinical trial design are associated with accrual of OA to clinical trials.

METHODS

All randomized Phase II and III CCTG-led clinical trials between 1990 and 2015 were included. Trial characteristics, including tumour type, stage, treatment, and exclusion/inclusion criteria were recorded. Percent of OA, age 65+, accrued to each trial was recorded. Trial characteristics were compared in trials initiated before and after 2000 using Chi-Square and t-tests.

RESULTS

A total of 68 trials were included. The majority opened before 2000 (56%), phase III (73%), chemotherapy trials (48%) and included patients with advanced disease (73%). Most common tumour sites included lung (17.6%), breast (13%), GU (13%), and GI (12%). OA comprised 41% patients accrued. No difference in accrual of OA to studies before and after 2000 was seen. Trials initiated after 2000 were more likely to have longer consent forms, need tissue available, require a new biopsy, and exclude patients with psychiatric disorders (p<0.05). Of these, requiring a new biopsy and length of consent were associated with proportion OA accrued (p<0.05).

CONCLUSION

Older adults remain underrepresented in clinical trials. Requiring a biopsy and consent length are associated with accrual of OA to studies.
Abstract #64_CAMO_2017

A POPULATION-BASED STUDY OF BILIARY TRACT CANCERS (BTCS) IN ALBERTA, CANADA

Arthur Lui 1, Dimas Yusuf 1, Zainab Abdelaziz 1, Brock Randolph 2, Eugene Batuyong 3, Sunita Ghosh 1, Oliver Bathe 3, Vincent Tam 3, Jennifer Spratlin 1

1 Cross Cancer Institute, University of Alberta, Edmonton AB; 2 Faculty of Medicine and Dentistry, University of Alberta, Edmonton, AB; 3 Tom Baker Cancer Centre, University of Calgary, Calgary AB

BACKGROUND
BTCs are poorly studied due to their rarity and heterogeneity. We explored demographics and outcomes of BTC pts over a 15 year period.

METHODOLOGY
All patients (pts) with biopsy-proven BTC (intrahepatic (IC) and extrahepatic (EC) cholangiocarcinomas, gallbladder cancers (GB), and ampulla of vater cancers(AV)) in Alberta were reviewed from January 1, 2000 to December 31, 2015. Demographic, pathologic, and survival data were extracted from electronic charts. Descriptive statistics were utilized. Overall survival (OS) was defined as the time from pathologic diagnosis to death date.

RESULTS
A total of 1617 pts with BTCs were identified. Median age was 68 with 52% being male. Table 1 demonstrates OS breakdown based on tumour location and stage. Regardless of location of primary tumour, grade impacted survival (median OS in with well differentiated tumours vs undifferentiated tumors 26.6 vs 3.9 months). Pts who received standard of care palliative Cisplatin/Gemcitabine (Cis/Gem) chemotherapy (n=233) had a median OS of 15.5 months.
Abstract #64_CAMO_2017 (continued)
A POPULATION-BASED STUDY OF BILIARY TRACT Cancers (BTcs) IN ALBERTA, CANADA

Table 1. Median OS based on stage and disease location.

<table>
<thead>
<tr>
<th>Location</th>
<th>n/%</th>
<th>Median OS (m)</th>
<th>Stage at diagnosis (n/%)</th>
<th>Median OS per stage (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>1617/100%</td>
<td>9.4</td>
<td>0-24/2.1%</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I-199/17.4%</td>
<td>64.6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>II-222/19.4%</td>
<td>24.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>III-140/12.3%</td>
<td>11.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>IV-557/48.8%</td>
<td>3.8</td>
</tr>
<tr>
<td>IC</td>
<td>386/24%</td>
<td>5.8</td>
<td>0-4/1.2%</td>
<td>NR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>I-51/15.6%</td>
<td>38.9</td>
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<td></td>
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<td></td>
<td>II-81/24.8%</td>
<td>24</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>III-32/9.8%</td>
<td>9.8</td>
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<td>IV-126/38.7%</td>
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<td>Unk-32/9.8%</td>
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<tr>
<td>EC</td>
<td>399/25%</td>
<td>10.1</td>
<td>0-13/3.5%</td>
<td>NR</td>
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<td></td>
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<td>I-74/20.2%</td>
<td>NR</td>
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<td>II-74/20.2%</td>
<td>16.3</td>
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<td>III-9/2.5%</td>
<td>4.9</td>
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<td>IV-187/51.1%</td>
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<td>Unk-9/2.5%</td>
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<td>Unk-12/7.1%</td>
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</tr>
<tr>
<td>AV</td>
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<tr>
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<td>I-199/17.4%</td>
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<td></td>
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<td></td>
<td>IV-557/48.8%</td>
<td>3.8</td>
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<tr>
<td>UNC</td>
<td>54/3%</td>
<td>3.1</td>
<td>0-24/2.1%</td>
<td>NR</td>
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<td>I-199/17.4%</td>
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<td>III-140/12.3%</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>IV-557/48.8%</td>
<td>3.8</td>
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</table>

CONCLUSION
Patients with AV and IC have the best and worst prognosis, respectively. Shorter survival is observed with higher stage, grade, and unresectable disease. Pts who received palliative Cis/Gem had better OS than reported in the pivotal phase III trial.
Abstract #11_CAMO_2017
STAGE II NON-SMALL CELL LUNG CANCER (NSCLC) TREATED WITH NON-SURGICAL APPROACHES: A MULTI-INSTITUTION REPORT OF OUTCOMES
Shaan Dudani¹, Xiaofu Zhu², Daniel W. Yokom³, Andrew Yamada⁴, Cheryl Ho⁴, Jason R. Pantarotto⁵,⁶, Natasha B. Leigh³, Tinghua Zhang⁶ and Paul Wheatley-Price¹,⁶
¹Division of Medical Oncology, Department of Medicine, University of Ottawa, Ottawa, Ontario
²Division of Medical Oncology, Cross Cancer Institute, Edmonton, Alberta
³Princess Margaret Cancer Centre, University of Toronto, Toronto, Ontario
⁴Department of Medical Oncology, British Columbia Cancer Agency, Vancouver, British Columbia
⁵Division of Radiation Oncology, Department of Radiology, University of Ottawa, Ottawa, Ontario
⁶Ottawa Hospital Research Institute, Ottawa, Ontario

BACKGROUND
Standard management of stage II non-small cell lung cancer (NSCLC) is surgery, often followed by adjuvant chemotherapy. However, some patients do not undergo surgery for various reasons. The optimal non-surgical management of stage II NSCLC is undefined, with a paucity of data to guide decision-making in this setting. We examined outcomes in this defined patient group.

METHODS
We reviewed stage II NSCLC patients treated non-surgically with curative intent from 2002-2012 across three Canadian academic cancer centres. Data collected included demographics, comorbidities, staging, treatments and survival. The primary endpoint was overall survival (OS). We assessed factors associated with treatment choice and OS.

RESULTS
58 patients were included; median age 74 (range 50-91); 44% female; 67% performance status 0-1. Stage II groupings: T2b-T3 N0 in 55%; N1 in 45%. Commonest reasons for inoperability: inadequate pulmonary reserve (27%); medical comorbidities (24%). All patients received radical radiotherapy (RT) (median 60 Gy [range 48-75]). 73% received RT alone; 24% received concurrent and 3% received sequential chemoradiotherapy (CRT). In multivariate analyses, CRT was less likely in older patients (≥70) (OR 0.28, 95% CI 0.11-0.70, p=0.006) and in patients with higher (>5) Charlson comorbidity scores (OR 0.34 [0.13-0.90], p=0.03) or normal (<10x10⁹/L) white blood cell counts (OR 0.26 [0.09-0.73], p=0.01). At time of analysis, 74% have died. Median OS was 22.9 months (95% CI 17.1-26.6). Patients receiving CRT had significantly longer median OS than those receiving RT alone (39.1 vs 20.5 months, p=0.0019), confirmed in multivariate analysis (HR 0.38, 95% CI 0.21-0.69, p=0.001).

CONCLUSIONS
Non-surgical approaches to management of stage II NSCLC are varied. Treatment with CRT was associated with significantly longer survival compared to RT alone, and a randomized trial may be warranted in this population.
Abstract #24_CAMO_2017

SEQUENCE OF THERAPY AND SURVIVAL AMONG ADVANCED PANCREATIC NEUROENDOCRINE TUMORS (PNETS)

Erica Tsang¹, Caroline Speers², Winson Cheung¹,²,³, Hagen F. Kennecke¹

¹Division of Medical Oncology, University of British Columbia, Vancouver, BC
²Gastrointestinal Cancers Outcomes Unit, British Columbia Cancer Agency, Vancouver, BC
³Department of Oncology, University of Calgary, Calgary, AB

BACKGROUND
Treatment for patients with pNETS include surgery (SG) and non-SG options, including ablative (ABL), systemic therapy (ST), somatostatin analogues (SSA). However, optimal initial therapy is unknown.

Objective
Our objective was to describe sequence of therapy for pNETs and to define differences in survival between treatment cohorts.

METHODS
Sequential patients with advanced pNETs referred to the BC Cancer Agency between 2000-2013 were reviewed. SG included any resection of primary or distant disease, while ST included chemo- and small molecule therapy, and peptide receptor radiotherapy.

RESULTS
Of 86 cases, median age was 61.1 years (IQR 50.4-68.2) and 49% were male, with median overall survival (OS) of 45.8 months (95% CI 28.3-63.4). Sites of metastases included liver (76%), lymph nodes (9%), lung (4%), peritoneum (5%), and bone (6%). Initial treatment included SG (33%), ABL (0%), ST (41%), and SSA (27%). Initial SG was associated with increased median OS (155.6 vs 21.1 months; p<0.01) and increased median progression-free survival (22.2 vs 4.2 months; p<0.01), compared to non-SG therapy. Median OS measured 16.0 months (95% CI 6.4-26.7) and 44.4 months (95% CI 12.6-76.2) for ST and SSA cohorts, respectively (p=0.001). 3% of patients who received initial non-SG therapy received SG in later lines of treatment. 48 patients (56%) received >1 line of therapy, with median OS of 67.3 months (95% CI 40.1-94.6). There was no difference in OS or PFS between second-line therapies.

CONCLUSIONS
We present the sequence of therapy and outcomes of a population cohort of advanced pNETs. Patients eligible for initial SG demonstrate an improved OS and median PFS compared to other currently available treatments. Upon progression, choice of second-line therapy was not prognostic and may be chosen based on disease and patient characteristics.
POSTER PRESENTATION (RESIDENTS/FELLOWS)

Abstract #31_CAMO_2017
CODE STATUS COMMUNICATION TRAINING IN CANADIAN POSTGRADUATE ONCOLOGY PROGRAMS: A NEEDS ASSESSMENT SURVEY
Oren Levine1, Sukhbinder Dhesy-Thind2, Meghan McConnell2, Melissa Brouwers1, Som Mukherjee1
1Department of Oncology, McMaster University, Hamilton, Ontario
2Department of Anesthesiology, University of Ottawa, Ottawa, Ontario

OBJECTIVES
Discussions with cancer patients around directives for cardiopulmonary resuscitation (CPR) or ‘code status,’ are often led by trainees in oncology. This study was carried out across Canada to identify current educational practices in this area and perceived gaps in training.

METHOD
Medical and radiation oncology residents and program directors from across Canada were invited to complete a survey. Questions pertained to current teaching practices, importance of this competency, level of satisfaction with current education and barriers to teaching skills for code status discussion. Relative frequencies of categorical and ordinal responses were determined.

RESULTS
Sixty-one responses have been collected (12 program directors and 49 residents) for a response rate of 32%. The study is on-going. Among residents, 43% received or expect to receive formal teaching regarding code status discussion while 58% of program directors endorse inclusion of this topic in formal curricula. Only 20% of residents reported receiving any evaluation for this competency while 33% of program directors indicated that formal evaluations are provided. Commonly identified barriers (by program directors and trainees) to teaching in this area included lack of time, and lack of teaching and evaluation resources. All program directors and 98% of residents positively endorsed the importance of this competency in both residency and subsequent practice. Few residents felt satisfied with current training on this topic and 88% felt that more formal teaching would be beneficial.

CONCLUSION
Canadian medical and radiation oncology residency program directors and trainees feel that code status communication is an important competency, yet we found that teaching and evaluation are limited in this area. Barriers to teaching and skill-building are identified. Further work is underway to develop novel code status communication educational resources for inclusion in competency by design curricula.
Abstract #48_CAMO_2017

OPTIMISING VASCULAR ACCESS FOR PATIENTS RECEIVING INTRAVENOUS SYSTEMIC THERAPY FOR EARLY STAGE BREAST CANCER – A SURVEY OF ONCOLOGY NURSES AND PHYSICIANS

Nathalie LeVasseur, Carol Stober, Kelly Daigle, Andrew Robinson, Sheryl McDiarmid, Sasha Mazzarello, Brian Hutton, Anil Abraham Joy, Dean Fergusson, John Hilton, Matthew McInnes, Mark Clemons

1 Division of Medical Oncology and Department of Medicine, Ottawa Hospital and University of Ottawa, Ottawa, Ontario
2 Ottawa Hospital Research Institute, Ottawa, Ontario
3 Department of Nursing, Ottawa Hospital, Ottawa, Ontario
4 Division of Medical Oncology, Cancer Centre of Southeastern Ontario, Kingston, Ontario
5 Clinical Epidemiology Program, Ottawa Hospital Research Institute, Ottawa, Ontario
6 Department of Oncology, University of Alberta, Cross Cancer Institute, Edmonton, Ontario
7 Department of Radiology, Ottawa Hospital, Ottawa, Ontario

BACKGROUND
Despite advances in systemic therapy choices for patients with early stage breast cancer, optimal practices for intravenous (IV) access remain unknown. This is particularly true for the use of central venous access devices (CVAD) such as PICCs and PORTs.

METHODS
A survey of medical oncologists and oncology nurses responsible for the care of breast cancer patients was performed in order to evaluate current practices, estimate complication rates and evaluate perceived risk factors for lymphedema.

RESULTS
Between March and June 2016, survey responses were received from 25 (30%) physicians and 57 (70%) oncology nurses. The administration of trastuzumab and/or anthracyclines was associated with a higher likelihood of recommending a CVAD. Other factors associated with the recommendation of a CVAD included prior difficult IV access and recommendations from the chemotherapy nurse. Although the perceived rates of complications associated with the use of PICCs and PORTs remained high, respondents felt that CVADs may improve patient quality of life. Reported risk factors associated with the risk of lymphedema were; axillary lymph node dissection, radiation to the axilla and line-associated infections. Factors known to be unrelated to lymphedema risk continue to be perpetuated.

CONCLUSION
Despite widespread use of chemotherapy for patients with breast cancer, significant variability exists with respect to the type of venous access used, as well as perceptions regarding the risks of using CVADs and the risk of developing lymphedema. Further prospective studies are needed to identify the best practice strategies.
Abstract #41_CAMO_2017

RATIONAL DESIGN AND IDENTIFICATION OF IMMUNOONCOLOGY DRUG COMBINATIONS

Marco AJ Iafolla¹, Heather Selby²,³, Kathrin Warner², Pamela S Ohashi², Benjamin Haibe-Kains⁴,⁵,⁶,⁷, Lillian L Siu²

¹Department of Medical Oncology, Juravinski Cancer Centre, McMaster University, Hamilton, Ontario
²Department of Medical Oncology, ³Princess Margaret Cancer Centre, University Health Network, University of Toronto, Toronto, Ontario
⁴Bioinformatics Program, Boston University, Boston, Massachusetts
⁵Department of Medical Biophysics, University of Toronto, Toronto, Ontario
⁶Department of Computer Science, University of Toronto, Toronto, Ontario
⁷Ontario Institute of Cancer Research, Toronto, Ontario

OBJECTIVE
To use transcriptomic profiling databases to guide the choice of immunooncology (IO) drug combinations, and identify all IO drug combinations undergoing clinical investigation in humans.

METHODS
IO targets were identified via searching PubMed and expert opinion. IO drugs were compiled by searching the NCI Drug Dictionary and pharmaceutical pipelines August 2016. Combination IO trials were obtained by searching doublet IO drug combinations in www.clinicaltrials.gov August 2016 to September 2016. IO genes were analyzed in The Cancer Genome Atlas (TCGA) dataset to determine IO expression levels and somatic mutations in tumor types with normal samples. Differentially expressed genes for each cancer type were determined using the Wilcoxon Rank Sum test and p-values were corrected for multiple testing (false discovery rate).

RESULTS
In total, 178 IO targets were identified, of which 77 targets have either regulatory-approved or investigational therapeutics in humans. In total, 420 combination trials involving two or more IO medications were identified (Table 1). TCGA was mined to extract the 178 IO targets in 7400 tumors originating from 22 cancer types. Renal clear cell cancer and squamous non-small cell lung cancer harbor the largest quantity of IO gene over-expression and under-expression, respectively. Although underpowered, several cancers appear to have no change to their IO gene expression when compared to normal. A large proportion of T-cell inhibition IO genes are over-expressed among different malignancies. All tumors possess ≥1 IO gene with a somatic mutation. The programmed cell death ligand-1 (PD-L1) expression level is consistent with its known clinical response in several malignancies.
Abstract #41_CAMO_2017 (continued)
RATIONAL DESIGN AND IDENTIFICATION OF IMMUNOONCOLOGY DRUG COMBINATIONS

CONCLUSION
The variability in IO target expression change and somatic mutation burden reflects an immune-cancer relationship of multiple regulated events that is likely optimally treated in combination therapy rather than monotherapy. Our analysis can enrich IO combination therapy selection.

<table>
<thead>
<tr>
<th>Disease site</th>
<th>Total count</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2 disease sites specified</td>
<td>106</td>
</tr>
<tr>
<td>2 disease sites specified</td>
<td>21</td>
</tr>
<tr>
<td>Breast</td>
<td>8</td>
</tr>
<tr>
<td>Dermatologic</td>
<td>109</td>
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<tr>
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<tr>
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<tr>
<td>Head and neck</td>
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<td>Hematologic</td>
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<tr>
<td>Lung</td>
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<tr>
<td>Neurologic</td>
<td>17</td>
</tr>
<tr>
<td>Sarcoma</td>
<td>5</td>
</tr>
<tr>
<td>All disease sites</td>
<td>420</td>
</tr>
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</table>
Abstract #50_CAMO_2017

GUIDELINE ADHERENCE MATTERS: RATES AND CONSEQUENCES OF NON-ADHERENCE TO ANTIEMETIC PRACTICE GUIDELINES

Shiru Lucy Liu¹, Mehrnoosh Pauls¹, Yizhou Zhao², Kara Thompson¹, Stephanie Snow¹.
¹Department of Medicine; ²Department of Radiation Oncology, Queen Elizabeth II Health Sciences Centre, Dalhousie University, Halifax, Nova Scotia, Canada

OBJECTIVES
(1) Evaluate the proportion of patients treated with highly (HEC) or moderately ematogenic chemotherapy (MEC) who received antiemetic regimens adherent to practice guidelines and; (2) Assess the rates of chemotherapy-induced nausea and vomiting (CINV).

METHODS
A provincial retrospective chart review was performed on 262 adult patients with a solid malignancy at any stage who received their first cycle of HEC or MEC at the Nova Scotia Cancer Centre (NSCC) in Canada between February and July 2016 inclusively. Patient, disease and treatment data were obtained. Adherence rate to the 2010 MASCC/ESMO Antiemetic Guidelines and rates of CINV based on the 2009 Common Toxicity Criteria version 4 were analyzed.

RESULTS
80 (30.5%) patients received HEC (including AC regimen) and 182 (69.5%) received MEC. Most common HEC and MEC were cisplatin and carboplatin, respectively. The rate of adherence to antiemetic guidelines was 64.1%. Among the 94 cases of non-adherence, 73 received a HEC regimen, consistent with a statistically higher rate of non-adherence with HEC as opposed to MEC (p<0.0001). 83 non-adherent cases were due to inadequate antiemetic combinations, most commonly the omission of an NK1 antagonist. Rates of grade ≥1 nausea and vomiting were 40.4% and 14.5% respectively for the whole study group, with a significantly higher rate of grade ≥1 nausea and/or vomiting in non-adherent population receiving HEC (p=0.01). Nausea and vomiting occurred more in patients who did not use breakthrough (p=0.04).

CONCLUSION
Adherence rate to MASCC antiemetic guidelines at the NSCC was 64.1%. Patients receiving a HEC had higher rates of non-adherence, and experienced higher rate of grade ≥1 nausea and vomiting.
Abstract #62_CAMO_2017
SINGLE CENTRE EXPERIENCE WITH ALK+ NON-SMALL CELL LUNG CANCER MANAGEMENT. A RETROSPECTIVE STUDY AT THE OTTAWA HOSPITAL

Nathalie Daaboul1, Garth Nicholas1, Scott Laurie1, Harman Sekhon2
1Medical Oncology, The Ottawa Hospital, University of Ottawa, Ottawa, Ontario
2Pathology, The Ottawa Hospital, University of Ottawa, Ottawa, Ontario

BACKGROUND
Selected patients with non-small cell lung cancer (NSCLC) have anaplastic lymphoid kinase (ALK) rearrangements which respond to ALK inhibitors (ALKi). Our primary objective is to review management of these patients at our cancer center.

METHODS
37 patients from 2012 to 2016 had positive immunohistochemistry screening for ALK rearrangement at the Ottawa Hospital. They were considered having ALK+ NSCLC. 35 patients had a FISH confirmation test. Patients’ demographics, treatment and outcome data was retrieved from electronic records. Descriptive statistics were used.

RESULTS
37 patients were included in the analysis. At diagnosis, median age was 63 years (36-90), 57% women, 60% performance status 0-1. Smoking status was 84% non-smokers (including 57% lifelong non-smokers). Pathology was primarily adenocarcinoma (97%). 24 patients (68%) presented with metastatic disease at diagnosis while 7 more had recurrent metastatic disease. Of all metastatic patients (n=31): first treatment was chemotherapy in 26% and ALKi in 61% (16 patients crizotinib - 3 ceritinib in a clinical trial). 81% received crizotinib and 37% ceritinib. Median lines of ALKi per patient was 1.3 (1-2). At the time of the analysis, 44% deaths had occurred. 19 patients were treated with first line ALKi, median time to progression was 10.5 months (11 patients), the rest still on treatment with no evidence of disease progression after 9 months of follow-up.

CONCLUSIONS
Management of ALK positive patients in our cancer centre was similar to what is described in the literature. The majority of patients received an ALK inhibitor as first or second line treatment. Further analysis is planned to assess if staining intensity on immunohistochemistry (percentage of positive tumour cells) has any correlation with response to treatment, especially for patients on ALK inhibitor.
OBJECTIVE
To observe the uptake and real world effect of primary GCSF prophylaxis on febrile neutropenia rates among patients undergoing adjuvant chemotherapy for breast cancer at our institution via comparison to a previously reported cohort study.

METHODS
A prospective study was performed at our centre using a real-time assessment of a cohort of patients beginning adjuvant FEC-D, TC, or FEC 100 chemotherapy between April and October 2010. A review of electronic records was conducted throughout the duration of each patient’s treatment, with data abstracted at each cycle for the entire cohort. A retrospective cohort was then identified of patients who began adjuvant chemotherapy between April and October 2014. A chart review was performed and variables collected. Data was recorded using SPSS and the uptake and impact of primary GCSF on FN rates were examined relative to the prior cohort through univariate and multivariate analysis.

RESULTS
Preliminary descriptive statistics reveal that there were 79 patients in 2010 and 63 patients in 2014 who initiated adjuvant chemotherapy between the specified dates. When comparing the 2010 and 2014 cohorts, 36 (46%) vs. 31 (49%) received TC, 37 (47%) vs. 29 (46%) FEC-D, and 6 (7%) vs. 3 (5%) FEC 100. Of those that received TC, 6 (17%) vs. 29 (94%) received primary prophylaxis and 27.8% vs. 10% developed FN. Of those that received FEC-D, 9 (24%) vs. 21 (72%) received primary prophylaxis and 35.1% vs. 10% developed FN. Of those that received FEC100, 1 (17%) vs. 2 (67%) received primary prophylaxis and 0% vs. 33% developed FN. The rate of primary prophylaxis was 20% in 2010 vs. 84% in 2014, while rates of FN were 29.1% vs. 11%.

CONCLUSION
With increased use of primary prophylaxis during adjuvant chemotherapy for breast cancer, the real world rate of febrile neutropenia has decreased at our centre.
CLINICAL OUTCOMES OF ELDERLY PATIENTS WITH LOCALLY ADVANCED RECTAL CANCER WHO RECEIVED NEOADJUVANT CHEMORADIATION: A RETROSPECTIVE COHORT STUDY OF A SINGLE INSTITUTION

Sam Babak, Erin Powell, Dawn Armstrong
Dr. H. Bliss Murphy Cancer Centre, Memorial University of Newfoundland, St. John’s, NL

BACKGROUND/OBJECTIVE
There is a paucity of data around treatment outcomes of elderly patients with locally advanced rectal cancer. The main objective of our study is to evaluate the impact of age on clinical outcomes.

METHODS
Using the Newfoundland and Labrador Cancer Registry, the data on 72 patients age 70 or older who diagnosed with locally advanced rectal adenocarcinoma between January 2005 and December 2016 were collected retrospectively.

RESULTS
The collected data from 40 patients has been analyzed and the data collection is yet to be completed. The median age of patients was 75, 26% male and 74% female. 66% of patients underwent abdominal peritoneal resection. Median duration from completion of chemoradiation to surgery was 47 days. 27% of patients developed post-surgical complications with VTE being the most common complication. 20% of patients had complete pathologic response. Median duration from surgery to adjuvant chemotherapy was 63 days. 9% of patients developed distant metastasis in follow up and median duration of follow up was 22 months. Median overall survival of the cohort was 40 months.

CONCLUSION
Elderly patients (≥ 70) with locally advanced rectal cancer who were treated with neoadjuvant chemoradiation had a 20% complete pathologic response. This result suggests that the multimodality treatment is beneficial in the elderly population.
BUILDING A MEDICAL ONCOLOGY COMMUNITY OF PRACTICE

Warren Fingrut¹,², Lauren Beck², and Dorothy Lo¹,²
¹Faculty of Medicine, University of Toronto, Toronto, ON
²Department of Hematology and Oncology, St. Joseph’s Healthcare Center, Toronto ON

OBJECTIVE
Communities of practice (COP) have been shown to be effective models for achieving quality outcomes in healthcare; however, we are not aware of any published medical oncology COPs. Here, we describe the application of the COP model to the Canadian medical oncology context.

METHODS
We established a COP at our urban community hospital and its networks. Goals were to decrease barriers to access, foster collaboration, and improve knowledge of guidelines in cancer care. We hosted six in-person multidisciplinary meetings, focusing on screening, diagnosis, and management of common solid tumors. Speakers were physicians across subspecialties actively practicing in cancer care. Healthcare providers affiliated with our hospital were invited to attend, and were asked to complete a survey following each session. A Likert scale was employed to assess whether COP goals had been realized.

RESULTS
Mean meeting attendance was 57.4 attendees (range=48-65) and a mean of 83.7% completed the survey and consented to this analysis. Attendees included family physicians (mean=41.2%), specialist physicians (mean=24.8%), and allied healthcare providers (mean=34.0%). Sessions featured increasing repeat attendees, with 85% at the final meeting having attended ≥1 prior meetings. Across the sessions, a majority of participants agreed or strongly agreed that the COP reduced barriers (mean=76±7.9%) and improved access to cancer care services (mean=82.4±8.1%) and subject matter experts (mean=91.7±4.2%); fostered teamwork (mean=84.5±6.8%) and a culture of collaboration (mean=94.8±4.2%); improved knowledge of cancer care services (mean=93.3±4.8%), standards of practice (mean=92.3±3.1%), and quality indicators (mean=77.5±6.3%); and improved cancer-related practice (mean=88.8±4.6%) and satisfaction in caring for cancer patients (mean=82.9±6.8%).

CONCLUSION
We have demonstrated the feasibility of medical oncology COPs, and their value in reducing barriers to access, fostering collaboration, and improving knowledge of guidelines in cancer care. Participants in our COP self-selected to attend, and may have been less willing to rate questions negatively. Qualitative analysis will provide further insights into improving the COP model.
Abstract #06_CAMO_2017
DEVELOPING A PROGNOSTIC IMMUNOHISTOCHEMICAL BIOMARKER PANEL IN NON-SMALL CELL LUNG CANCER (NSCLC)
Mathew Finniss¹, Stacy Grieve², Ayush Ray², Jonathan Moore², Alli Murugesan¹, Jane Agar³, Cenk Acar³, Tony Reiman¹,²,⁴
¹Faculty of Medicine, Dalhousie University, Saint John, New Brunswick
²Department of Biology, University of New Brunswick, Fredericton, New Brunswick
³Department of Pathology, Saint John Regional Hospital, Saint John, New Brunswick
⁴Department of Oncology, Saint John Regional Hospital, Saint John, New Brunswick

INTRODUCTION
Surgical resection is first line therapy for early stage NSCLC, though many patients relapse. Adjuvant chemotherapy improves overall survival (OS) 4 – 15% in patients with resected NSCLC, but there is no way to identify which patients benefit from therapy. A 15 gene mRNA-based signature published by Zhu et al., was prognostic and predictive for resected NSCLC, however technical limitations prevent its validation and application as a predictive tool. The objective of this project is to translate the 15 gene signature published by Zhu et al into an immunohistochemical based protein panel which could be validated and clinically used to select patients for adjuvant chemotherapy.

METHODS
Microarrays were constructed from tissue samples of 200 patients with resected NSCLC treated at the Saint John Regional Hospital (SJRH). The expression of FOSL2 TRIM14, STMN2 and ATP1B was quantified using standard immunohistochemical techniques and correlated with clinicopathological factors.

RESULTS
Patients with resected stage II-III NSCLC and low expression of FOSL2 had significantly worse OS (HR = 0.38; p = 0.0231) and progression free survival (PFS) (HR = 0.30; p = 0.0052). Similarly, patients with resected stage II-III NSCLC and low expression of ATP1B1 had significantly worse PFS (HR = 0.50; p = 0.0338) and trended towards worse OS (HR = 0.52, p = 0.0596). Although not statistically significant, patients with resected II-III NSCLC and high expression of STMN2 or low expression of TRIM14 trended towards worse OS and PFS. Results of multivariate analysis integrating these biomarkers into a prognostic model will be presented.

CONCLUSIONS
We have identified 4 genes that are prognostically concordant with an established biomarker panel at the protein level. Future research aims to investigate the predictive aspect of this panel using a large randomized clinical trial dataset.
Abstract #25_CAMO_2017
TIMELINESS OF ADJUVANT CHEMOTHERAPY IN PATIENTS WITH RESECTED PANCREATIC CANCER
David H. Deng\textsuperscript{1}, Winson Y. Cheung\textsuperscript{2}
\textsuperscript{1}Faculty of Medicine, University of British Columbia, Vancouver, British Columbia
\textsuperscript{2}Health Services Research, Cancer Control Alberta, Calgary, Alberta

OBJECTIVE
Timeliness of chemotherapy is an important predictor of survival for patients with breast and colorectal cancer. The effects of treatment timing remain largely unknown for patients with pancreatic cancer. This study aims to identify independent predictors of timeliness and overall survival for this clinical population.

METHODS
We conducted a retrospective analysis of 179 patients with resected pancreatic cancer who subsequently started adjuvant chemotherapy between 2008 and 2014 at any 1 of 6 cancer centers across British Columbia. Logistic regression was used to identify predictive factors for adjuvant chemotherapy timing. Prognostic factors for survival were ascertained using multivariate Cox proportional hazards models.

RESULTS
Our study cohort included 91 males (51%) and 88 females (49%), respectively. At time of diagnosis, 145 patients (81%) had nodal involvement and 107 patients (60%) had good ECOG performance status (ECOG 0-1). The median age of diagnosis was 67 years. The median wait time for start of adjuvant chemotherapy post-resection was 70 (range 19-446) days. Abnormal bilirubin was the only factor significantly correlated with delayed chemotherapy (OR, 3.89; 95% CI, 1.55-9.73; \( P = 0.004 \)). Median overall survival was 468 days following resection (95% CI, 425-538). Multivariate survival analysis showed that high CA 19-9 levels (HR, 2.44, 95% CI: 1.36-4.40, \( P = 0.003 \)) and abnormal bilirubin (HR, 0.40; 95% CI, 0.22-0.73; \( P = 0.003 \)) were prognostic factors for overall survival. Median survival for patients who waited up to 35, 70 or 105 days for chemotherapy following resection were 588 days (95% CI, 270-776), 490 days (95% CI, 360-688) and 466 days (95% CI, 432-538) respectively. Overall, timeliness was not predictive of survival (HR, 1.12; 95% CI, 0.64-1.97; \( P = 0.70 \)).
Abstract #25_CAMO_2017 (continued)

TIMELINESS OF ADJUVANT CHEMOTHERAPY IN PATIENTS WITH RESECTED PANCREATIC CANCER

CONCLUSION

Serum bilirubin post-resection impacted timeliness of adjuvant chemotherapy, but timeliness did not modify outcomes in study cohort.

Table 1. Multivariate Cox Proportional Hazard Model for Predictors of Death (n = 179)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hazard Ratio</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 70 days post-resection</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&gt; 70 days post-resection</td>
<td>1.12</td>
<td>0.64 to 1.97</td>
<td>0.70</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Female</td>
<td>0.74</td>
<td>0.40 to 1.35</td>
<td>0.32</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;70</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>≥70</td>
<td>0.97</td>
<td>0.57 to 1.65</td>
<td>0.90</td>
</tr>
<tr>
<td>ECOG</td>
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<td></td>
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</tr>
<tr>
<td>≤1</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>≥2</td>
<td>1.11</td>
<td>0.62 to 1.99</td>
<td>0.72</td>
</tr>
<tr>
<td>TNM stage</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>≤l</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>≥l</td>
<td>0.79</td>
<td>0.42 to 1.49</td>
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<td>Nodal involvement</td>
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<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Yes</td>
<td>1.29</td>
<td>0.61 to 2.70</td>
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<td>Carcinoembryonic Antigen</td>
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<tr>
<td>≤5 μg/L</td>
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<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&gt;5 μg/L</td>
<td>1.77</td>
<td>0.84 to 3.72</td>
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<tr>
<td>Carbohydrate Antigen 19-9</td>
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<tr>
<td>≤37 U/mL</td>
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<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&gt;37 U/mL</td>
<td>2.44</td>
<td>1.36 to 4.40</td>
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</tr>
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<td>Post-op complications</td>
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<td></td>
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</tr>
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<tr>
<td>Yes</td>
<td>0.86</td>
<td>0.46 to 1.62</td>
<td>0.64</td>
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<td>Bilirubin</td>
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<td></td>
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<td>8-22 μmol/L</td>
<td>–</td>
<td>–</td>
<td>–</td>
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<tr>
<td>&lt;8 or &gt;22 μmol/L</td>
<td>0.40</td>
<td>0.22 to 0.73</td>
<td>0.003</td>
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<td>Red Blood Cell</td>
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<td></td>
</tr>
<tr>
<td>4.5-5.9 ×10^12/L</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&lt;4.5 or &gt;5.9 ×10^12/L</td>
<td>2.25</td>
<td>1.00 to 5.04</td>
<td>0.05</td>
</tr>
<tr>
<td>White Blood Cell</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0-10.5 ×10^9/L</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&lt;4.0 or &gt;105 ×10^9/L</td>
<td>1.06</td>
<td>0.53 to 2.11</td>
<td>0.87</td>
</tr>
<tr>
<td>Hemoglobin</td>
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<td></td>
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<tr>
<td>136-170 g/L</td>
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<td>–</td>
<td>–</td>
</tr>
<tr>
<td>&lt;136 or &gt;170 g/L</td>
<td>0.74</td>
<td>0.29 to 1.89</td>
<td>0.53</td>
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<tr>
<td>Past surgery</td>
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<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>No</td>
<td>0.73</td>
<td>0.41 to 1.30</td>
<td>0.28</td>
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</table>
Abstract #52_CAMO_2017

ELIGIBILITY OF METASTATIC COLORECTAL CANCER PATIENTS FOR PALLIATIVE INTENT REGORAFENIB THERAPY
Arkhyamil Angeles¹, Wayne Hung¹, Winson Y. Cheung¹
¹Department of Medicine, University of British Columbia, Vancouver, BC

OBJECTIVE
The CORRECT trial demonstrated survival benefits of regorafenib monotherapy in patients with metastatic colorectal cancer (CRC) refractory to chemotherapy and biological therapy. However, stringent criteria used to determine treatment eligibility may limit its external validity. We aimed to examine treatment attrition rates and eligibility for regorafenib in routine clinical practice.

MATERIALS AND METHODS
Patients diagnosed with metastatic CRC between 2009 and 2014 who received 3 or more lines of systemic therapy at the British Columbia Cancer Agency were identified. During the study, cetuximab (cmab) and panitumumab (pmab) were only used in the chemo-refractory setting. Data on clinico-pathological variables and outcomes were ascertained and analyzed. Eligibility was defined based on criteria outlined in the CORRECT trial.

RESULTS
A total of 391 patients were included among whom only 39% were eligible for regorafenib. The study cohort had a median age of 61 years. 247 (63%) were male, and the majority (78%) was Caucasian. 237 (60%) had a primary tumor in the colon. 267 (81%) had lymph node involvement, and 225 (59%) had distant metastases. In patients treated with cmab, main reasons for ineligibility were ECOG performance status (PS) >1 (26.9%), AST >2 x upper limit of normal (ULN) (6.5%), and arterio-venous thrombotic or embolic events in the preceding 6 months (6.5%). In patients treated with pmab, main reasons for ineligibility were ECOG PS >1 (46.6%), total bilirubin >1.5 x ULN (14.1%), and thrombotic or embolic events in the past 6 months (5.7%). Univariate analyses showed that regorafenib-eligible patients had longer median overall survival than ineligible patients (44.0 vs 37.1mo, P=0.028).

CONCLUSIONS
The strict eligibility criteria disqualify the majority of patients with metastatic CRC for regorafenib. As ineligibility predicts poorer outcomes, trials aimed at serving protocol-ineligible patients are warranted.
Abstract #65_CAMO_2017

THE SAFETY OF CONTINUOUS IV ADMINISTRATION OF THE CXCR4 ANTAGONIST PLERIXAFOR (PLX) AND ITS IMPACT ON THE IMMUNE MICROENVIRONMENT IN PATIENTS WITH ADVANCED ADENOCARCINOMAS

Martin Smoragiewicz1,2, James Thaventhiran1, Aarthi Gopinathan1, Lukasz Magiera1, Pippa Corrie1, Rebecca Brais4, Michael Williams1, Donna-Michelle Smith2, Charlie Massie1, Maricica Zabrautanu2, Tobias Janowitz2, Fraz Mir6, Anita Chhabra2, Ferdia Gallagher6, Edmund Godfrey5, Nitzan Rosenfeld1, Wendi Qian2, Douglas Fearon2,7,8, Bristi Basu1,2, Duncan Jodrell1,2
1Cancer Research UK Cambridge Institute, Cambridge, UK
2Cambridge Clinical Trials Unit-Cancer Theme, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
3Department of Oncology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
4Department of Histopathology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
5Clinical Pharmacology Unit, Department of Medicine, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
6Department of Radiology, Cambridge University Hospitals NHS Foundation Trust, Cambridge, UK
7Cold Spring Harbor Laboratory, Cold Spring Harbor, NY 11724, USA;
8Weill Cornell Medical College, New York, NY 10021, USA.

BACKGROUND
Despite impressive results in select cancers, immunotherapy with anti-CTLA-4 or PD-1/PD-L1 antibodies is ineffective in others, including pancreatic ductal adenocarcinoma (PDAC). In a genetically engineered mouse model of PDAC, blockade of the CXCL12/CXCR4 axis by PLX, a small molecule CXCR4 antagonist, controlled tumor growth when combined with anti-PD-L1.

METHODS
The primary objective was to assess the safety of PLX at continuous intravenous infusion (CIV) rates over 7 days needed to achieve a concentration at steady state (Css) of ≥2μg/ml, an active plasma concentration in pre-clinical studies. Patients with advanced PDAC, colorectal or ovarian cancer refractory to conventional chemotherapy, biopsiable metastases, and a normal lymphocyte count were eligible. 4 cohorts were planned (3+3 dose escalation design, 20 to 120μg/kg/hr). Plasma [PLX] was measured at 24-72-168hr. Exploratory objectives include assessment of immune tumor microenvironment (biopsies pre/post infusion), and circulating biomarkers.

RESULTS
14 pts have been enrolled (age 51-75, male 79%, 13 CRC, 1 PDAC). All pts received at least 2 prior therapies. Plasma [PLX] reached near steady state by 72hr and increased linearly with dose. Pts in the 80μg/kg/hr cohort achieved a Css≥2 μg/ml (mean 2.3, range 2.2 – 2.4μg/ml). A dose limiting toxicity (Gr 3 vasovagal reaction) occurred at 120μg/kg/hr, and the cohort is being expanded to 6 pts. Drug related adverse events were insomnia (7pts) and paresthesiae (7pts), and were dose related. White blood cell (WBC) subsets, including CD34+ cells, rapidly mobilized into the peripheral circulation and maintained throughout the infusion.

CONCLUSIONS
Continuous PLX infusion is safe and tolerable above the target Css of 2 μg/ml, with expected pharmacodynamic WBC mobilization. The RP2D, determined following review of PK and PD data, will be evaluated in 10 patients with PDAC in an expansion cohort. Our intention is to combine CIV PLX with an immune-checkpoint inhibitor in a subsequent study.
ASSESSMENT OF EDUCATIONAL AND SUPPORTIVE CARE NEEDS OF CANADIAN MELANOMA PATIENTS AND SURVIVORS ATTENDING AN OUTPATIENT CLINIC

Rama Koneru¹, Jose Chang¹, Manon Lemonde², Jahnavi Mundluru¹, Mathushan Subasri¹
¹Durham Region Cancer Centre, Oshawa, Ontario

INTRODUCTION
Rapid development in melanoma treatment options have significantly improved overall survival, but complementary patient education is not available. An environmental scan also confirmed a lack of formal educational programs and support groups for melanoma patients and survivors in the Durham region.

OBJECTIVES
Identify the supportive care needs of melanoma patients and survivors, develop an intervention program to address these needs, and seek feedback on the program prior to its implementation.

METHODS
Utilizing a cross-sectional mixed method design, patients were recruited both prospectively and retrospectively. Participants completed a sociodemographic questionnaire and Supportive Care Needs Survey; those who consented took part in a focus group. Descriptive statistics and Likert summated scale analysis were completed to identify the highest reported needs. ANOVA, t-tests, and chi-square were conducted to investigate relationships between needs and sociodemographic information. Finally, focus group data was thematically analyzed.

RESULTS
75 patients and survivors completed the questionnaires. The sample was composed up of 46 males and 29 females, with an average age of 63. Most patients identified their needs were being met, however significant unmet needs were identified in three constructs: psychological, health system and information, and melanoma specific. Specifically, the highest reported needs involved fears or uncertainty about their prognosis and of recurrences. Analyses of sociodemographic data showed a higher level of needs for females, those under the age of 63, and those unmarried and/or living alone.

CONCLUSION
Based on these identified high needs, a multifaceted program to address the three constructs was developed. Focus group feedback further reinforced the benefits of the intervention program. Currently the intervention program is in the process of being implemented and the intent is to complete a one-year post evaluation.
Abstract #08_CAMO_2017
COMPARISON BETWEEN CANADIAN AND BRITISH ONCOLOGY DRUG REVIEW RECOMMENDATIONS AND THEIR IMPACT ON PATIENT ACCESS
Matthew K. Smith¹, Omar F. Khan², Steven Yip², Patricia A. Tang².
¹Undergraduate Medical Education, Cumming School of Medicine, University of Calgary, Calgary, AB
²Department of Oncology, Tom Baker Cancer Centre, University of Calgary, Calgary, AB

PURPOSE
Access and funding for oncology medications in Canada and the United Kingdom are influenced by recommendations released by the pan-Canadian Oncology Drug Review (pCODR) and the National Institute for Health and Care Excellence (NICE), respectively. This study investigated variations between these organizations’ recommendations and the clinical implications these differences had on access to medications.

METHODS
The pCODR Drug Reviews and NICE Technology Appraisal Guidance databases were reviewed to identify all oncological drug recommendations from 2008 to 2016. Recommendations were evaluated according to an algorithm to identify clinically relevant differences that restricted access in one jurisdiction relative to the other. Length of time from drug submission to final recommendation by NICE and pCODR were compared using Wilcoxon rank sum tests, as was the length of time between regional funding approval.

RESULTS
Between 2008 and 2016, 31 medication indications were reviewed by both pCODR and NICE. For 12 recommendations, funding was only supported by one agency. An additional eight medications were approved by both agencies, but with clinically relevant differences in wording, with each agency making a more restrictive recommendation four times. Average time from submission to recommendation was faster for pCODR than NICE (213.8 days vs. 407.9 days; p < 0.001), but the average time to funding decision (Table 1) was similar (410.1 days in Canada vs. 407.9 days in the United Kingdom; p = 0.71).

CONCLUSIONS
Although clinically relevant differences in recommendations do exist between NICE and pCODR, neither agency was consistently more restrictive. pCODR recommendations were made more quickly than NICE, but this did not translate into faster funding approval in Canada. Jurisdictional barriers exist for cancer patients which could be mitigated through harmonization and acceleration of drug review processes.

Table 1. Length of time from drug submission at agency to funding decision.

<table>
<thead>
<tr>
<th>Agency</th>
<th>Mean Length (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NICE (n=31)</td>
<td>407.9</td>
</tr>
<tr>
<td>pCODR to Provincial Funding Decision</td>
<td></td>
</tr>
<tr>
<td>AB (n=22)</td>
<td>417.6</td>
</tr>
<tr>
<td>BC (n=17)</td>
<td>410.1</td>
</tr>
<tr>
<td>SK (n=21)</td>
<td>401.8</td>
</tr>
<tr>
<td>MN (n=20)</td>
<td>448.0</td>
</tr>
<tr>
<td>ON (n=20)</td>
<td>373.5</td>
</tr>
</tbody>
</table>
Abstract #14_CAMO_2017

A POPULATION-BASED ANALYSIS OF URBAN-RURAL DISPARITIES IN ADVANCED PANCREATIC CANCER (APC)

MANAGEMENT AND OUTCOMES

Thomas D. Canale1, Winson Y. Cheung2,3
1University of British Columbia, Vancouver, BC
2British Columbia Cancer Agency, Vancouver, BC
3University of Calgary, Calgary, AB

OBJECTIVE

Urban-rural disparities exists for many cancers. Given that advanced pancreatic cancers (APC) frequently require urgent multidisciplinary care, we aimed to determine the effect of geographical barriers on management and outcomes in this specific patient population.

METHODS

Patients diagnosed with APC (locally advanced or metastatic disease) from 2008 to 2015 and received gemcitabine (gem), gem plus nab-paclitaxel (gem/nab), or FOLFIRINOX at any 1 of 6 cancer centers in British Columbia were reviewed. Using postal codes, Google Maps Distance Matrix determined the distance from each patient’s residence to the closest cancer center. Rural and urban status were defined as patients living ≥ 100 km and < 100 km from the closest treatment center, respectively. Univariate and Cox regression analyses were applied to examine whether rurality resulted in variations in management and outcomes.

RESULTS

In total, we identified 659 patients: median age 68 years, 54.3% men, and 45.7% metastatic disease. Among them, 19.3% lived rurally. For treatment, 67.7%, 9.2%, and 23.1% received gem, gem/nab, and FOLFIRINOX, respectively. There were no differences in baseline clinical characteristics between rural and urban patients (all p>0.05). Furthermore, there were no significant variations in treatment patterns. For example, time from diagnosis to oncology appointment was 31.5 and 28.6 days for rural and urban patients, respectively (p=0.44). Use of gem/nab (10.1 vs 9.1%) and FOLFIRINOX (21.0 vs 23.5%) were similar regardless of rurality. In multivariate Cox regression models, risk of death was comparable between rural and urban groups (HR 0.864, 95% CI 0.619-1.206, p=0.39) after controlling for confounders.

CONCLUSIONS

The strategic allocation of cancer care delivery across 6 centers in British Columbia may serve as a model for other jurisdictions that experience geographical disparities in outcomes from cancers that frequently require complex multidisciplinary care.
Abstract #17_CAMO_2017
FUTILE INTERVENTIONS FOR COMORBIDITIES IN COLORECTAL CANCER PATIENTS AT THE END OF LIFE

Davis Sam¹, Richard Lee-Ying², Sally Lau², Winson Cheung³

¹Faculty of Medicine, University of British Columbia, Vancouver, BC
²Department of Medical Oncology, BC Cancer Agency, Vancouver, BC
³Department of Oncology, University of Calgary, Calgary, AB

BACKGROUND
We hypothesized that futile care for comorbidities among terminal colorectal cancer (CRC) patients is prevalent and associated with specific demographics.

METHODS
We constructed a retrospective cohort of decedents aged ≥18 years who were diagnosed with CRC from 2008 to 2012 and who died by the end of 2013. We analyzed population-based data through linked provincial files that included information on cancer diagnosis and treatment, pharmacy records, hospital discharges, and vital statistics. We defined endpoints for futile care as ≥1 hospitalization and/or ≥1 prescription for statins, dihydropyridine calcium channel blockers (CCBs), or acid suppressants within the 2 months preceding death.

RESULTS
We included 2,530 patients. Median age at CRC diagnosis and death was 70 (range 19-102) and 72 (range 19-103) years, respectively. Among them, 59% were men, 66% had colon cancer, and 87% were diagnosed with advance disease. Median time from diagnosis to death was 452 (range 6-2022) days. In terms of futile care, 4.7% had hospitalizations, 8.7% received statins, 6.8% received CCBs, and 38.2% received acid suppressants within 2 months prior to death. In multivariate analyses, there were no clear associations between demographics and hospitalizations. With respect to futile medication use, advanced age was correlated with increased use of statins (OR 2.235, 95%CI 1.469-3.401, p<0.001) and CCBs (OR 2.039, 95%CI 1.304-3.190, p=0.002), but inversely associated with use of acid suppressants (OR 0.750, 95%CI 0.598-0.941, p=0.013). Men were also more likely to receive statins (OR 1.653, 1.099-2.488, p=0.016), but less likely to be prescribed acid suppressants (OR 0.764, 0.608-0.960, p=0.021).

CONCLUSIONS
Even near death, a fair number of decedents with CRC continued to receive medications for their comorbidities that were unlikely to provide clinically meaningful benefits to them. Futile care was associated with advanced age and gender.
Abstract #30_CAMO_2017
THE EFFECT OF CISPLATIN VERSUS CARBOPLATIN ON CANCER OUTCOMES FOR SMALL CELL LUNG CANCER PATIENTS IN MANITOBA

Trevor Aquin¹, Dr. David Dawe², Dr. Shantanu Banerji²
¹. University of Manitoba, Winnipeg, Manitoba
². Department of Internal Medicine, Faculty of Health Sciences, University of Manitoba, Winnipeg, MB, Canada

Small cell lung cancer (SCLC) is associated with high rates of mortality and treatment involves chemotherapy. In non-small cell lung cancer, using cisplatin results in superior response and survival compared to carboplatin, but causes more toxicity. Little research regarding this drug choice in SCLC exists, but available studies suggest equivalent survival. Nevertheless, oncologists continue to use cisplatin preferentially.

Using the population-based Manitoba Cancer Registry, we identified SCLC cases diagnosed from 2004 to 2013 in Manitoba and completed a retrospective chart review for those treated with chemotherapy. Demographics, tumour response, and treatment toxicity were compared between cisplatin and carboplatin treated groups. Overall survival (OS) and progression free survival (PFS) were evaluated using multivariate Cox proportional hazard methods.

Of the 531 patients identified, 139 (26.2%) received carboplatin and 392 (73.8%) received cisplatin as part of first line chemotherapy. More patients who received carboplatin had poor performance status (13.7% v 7.4%), elevated LDH (58.3% v 42.3%), and extensive stage disease (69.8% v 54.1%), all p<0.01. Unadjusted median OS was 245 v 332 days for carboplatin and cisplatin. Multivariable adjusted analysis for OS using cisplatin patients completing treatment as the comparator showed hazard ratios for carboplatin completers – 0.98 (0.75-1.26), cisplatin incompleters – 0.998 (0.70-1.40), and carboplatin incompleters – 1.53 (1.02-2.28). For PFS carboplatin completers – 1.00 (0.77-1.30), cisplatin incompleters – 0.79 (0.56-1.12), and carboplatin incompleters – 1.18 (0.77-1.82). Receipt of cisplatin was associated with a higher chance of completing 4-6 cycles at 80.9% v 69.1% for carboplatin regimens. However, those treated with carboplatin had significantly less neutropenia (57.6% v 74.7%), nephrotoxicity (2.9% v 13.5%), neurotoxicity (0.7% v 12.0%), and nausea/vomiting (28.1% v 42.6%) associated with treatment, all p<0.01.

Carboplatin appears to be an equally effective treatment option for SCLC, facilitating equivalent survival while avoiding toxicity. Clinicians may wish to reexamine their preference for cisplatin.
Abstract #44_CAMO_2017
GENDER DISPARITIES IN NON-SMALL CELL LUNG CANCER: A SYSTEMATIC REVIEW
Noor Alsaadoun,1 Karen Kopciuk,2 Dr. Desiree Hao,2 Karl Riabowol,1 Morley Hollenberg Hollenbrg,3 Gwyn Bebb2
1Cumming School of Medicine, University of Calgary, Calgary/AB/Canada, 2Alberta Health Services, Calgary/AB/Canada, 3Department of Cancer Biology, University of Calgary, Calgary/AB/Canada

BACKGROUND
Although lung cancer is the second most diagnosed malignancy in both sexes, evidence suggests that the experience differs in women compared to men. Lung cancer incidence in men has steadily decreased since the mid-1980s, while increased in women. These differences are partially smoking-related patterns. Additional epidemiological evidence suggests that gender impacts most facets of the lung cancer experience, including incidence, susceptibility, and molecular basis of the disease. However, there is a lack of consensus on both the magnitude and etiology of these gender-based differences. The aim of this systematic review is to precisely define this gender disparity among non-small cell lung cancer (NSCLC) patients worldwide and summarize current opinions about the molecular basis for these observations.

METHODS
A preliminary rapid review was launched to outline gender disparity among NSCLC patients in North America, Europe and South Asia. Independent studies were utilized from Medline; Embase; and Cochrane Database of Systematic Reviews for the period between 1996 and 2016. Based on these results, a systematic review was carried out using Medline database. The main outcome measures are incidence and factors influencing NSCLC between sexes.

RESULTS
The preliminary search identified 17 articles for review. Analysis suggests that females are more susceptible to tobacco related carcinogens and have a younger age at diagnosis. We also observed an increase of female patients inclusion in the clinical studies over time. Based on pre-specified selection criteria, the systematic review generated 367 studies, which have been considered for further analysis. We determined gender differences in incidence and its molecular aberration utilizing data from independent publications based on rapid analysis of observational studies.

CONCLUSION
Our systematic literature review will help validate our preliminary findings that gender disparities in lung cancer do exist. Our findings will provide a platform for policy makers, researchers and clinicians to design clinical trials and interventions that account for these disparities.

Keywords: Gender disparities, Incidence, Molecular aberration, NSCLC
Abstract #53_CAMO_2017
FEASIBILITY OF IMPLEMENTING A WEB-BASED PATIENT FOLLOW-UP PLATFORM INTO THE BC CANCER AGENCY FOR IMPROVING QUALITY OF LIFE CARE AND RESEARCH
Bhavan Panghali 1, Sara K Taylor 2, Rasika Rajapakshe 1,3,4
1 Medical Physics, BC Cancer Agency Centre for the Southern Interior, Kelowna, BC
2 Medical Oncology, BC Cancer Agency Centre for the Southern Interior, Kelowna, BC
3 Department of Surgery, Division of Radiation Oncology and Developmental Radiotherapeutics, University of British Columbia, Vancouver, BC
4 Department of Computer Science, University of British Columbia, Okanagan Campus, Kelowna, BC

OBJECTIVE
This project will evaluate the feasibility of implementing an online system to collect long-term patient-reported outcomes and to contact patients treated at the BC Cancer Agency – Centre for the Southern Interior (BCCA-CSI).

METHODS
Eight hundred BCCA-CSI patients will be surveyed over 12 months. Eligible participants include English speaking individuals 18 years or older who have attended at least one BCCA-CSI appointment. To evaluate contact and follow-up preferences, surveys will collect information on internet access, preferred methods for follow-up or contact and likelihood of using an online follow-up system. Follow-up method choices include online, mail and phone. Choices for contact include email, mail, phone and text message. Survey data will be supplemented with demographic information from participants’ files.

RESULTS AND CONCLUSIONS
Interim analysis has been completed on the first 364 participants. Table 1 includes a summary of participant demographics.

The majority of participants preferred email as primary contact method (56%). Mail (22%), phone (17%) and text (<1%) follow respectively in decreasing preference. Remaining participants expressed no preference (4%). An online system was the preferred method for follow-up taking place in addition to routine in-person appointments. Participants preferred an online system (60%) over phone (20%) or mail follow-up (19%). Remaining participants would not wish for any follow-up with BCCA-CSI.
Abstract #53_CAMO_2017 (continued)

FEASIBILITY OF IMPLEMENTING A WEB-BASED PATIENT FOLLOW-UP PLATFORM INTO THE BC CANCER AGENCY FOR IMPROVING QUALITY OF LIFE CARE AND RESEARCH

Future analysis will explore correlation between demographic factors and contact or follow-up method preferences. Implications of a successful online follow-up system include improvement of communication and survivorship care for BCCA-CSI patients. This will allow for research into and better understanding of long-term effects of treatments on quality of life.

Based on our interim analysis, we conclude that web-based communication will be well-received and a feasible method for long-term follow-up with BCCA-CSI patients.

Table 1. Demographic data for 364 study participants

<table>
<thead>
<tr>
<th>Demographic Characteristic</th>
<th>Number (N=364)</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
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<td><strong>Sex</strong></td>
<td></td>
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</tr>
<tr>
<td>Male</td>
<td>181</td>
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<tr>
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</tr>
<tr>
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<td><strong>Age</strong></td>
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<tr>
<td>18-30</td>
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<td>31-50</td>
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<td>9.1</td>
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<td>71-80</td>
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<td>28</td>
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<td>81+</td>
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<td>11</td>
</tr>
<tr>
<td>N/A</td>
<td>4</td>
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</tr>
<tr>
<td><strong>Driving Distance to BCCA-CSI</strong></td>
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<td></td>
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<tr>
<td>0-50 km</td>
<td>176</td>
<td>48.4</td>
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<td>51-200 km</td>
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<tr>
<td>400+ km</td>
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<td><strong>Tumor Group</strong></td>
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<tr>
<td>Lung</td>
<td>59</td>
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<tr>
<td>GI</td>
<td>49</td>
<td>13.5</td>
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<tr>
<td>GU</td>
<td>49</td>
<td>13.5</td>
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<tr>
<td>Head and Neck</td>
<td>45</td>
<td>12.4</td>
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<td>Lymphoma</td>
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<td>13</td>
<td>3.6</td>
</tr>
<tr>
<td>CNS</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Skin</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>3.3</td>
</tr>
</tbody>
</table>
Abstract #10_CAMO_2017
MEDICAL ONCOLOGY COMMUNITIES OF PRACTICE: INSIGHTS FROM A QUALITATIVE ASSESSMENT OF FEEDBACK
Lauren A. Beck, Warren Fingrut, and Dorothy Lo

1. Department of Hematology and Oncology, St. Joseph’s Healthcare Center, Toronto, ON
2. Faculty of Medicine, University of Toronto, ON

OBJECTIVE
Here we analyze qualitative feedback from a CME series designed to build a medical oncology community of practice (COP), to guide future implementation of COPs.

METHODS
A COP was established at our urban community hospital and its networks. COP goals were to improve knowledge of guidelines, decrease barriers, and foster collaboration in the community. Six multidisciplinary meetings were held, and healthcare providers from the hospital’s networks were invited to attend. Attendees were invited to complete a feedback survey. In addition to quantitative analysis (presented separately), qualitative analysis was performed on the surveys of consenting individuals. Participants were asked what they would suggest to “stop”, “start” and “continue” in the series.

RESULTS
Themes that emerged from feedback to improve the COP were: enhancing interprofessional collaboration, expanding clinical resources, increasing education resources, reducing barriers to access, and fostering a culture of partnership. To enhance collaboration, participant suggestions included expanding multidisciplinary panels to include pathology, radiology, allied health professionals and other disciplines. Regarding clinical resources, recommendations included developing a rapid diagnostic clinic and physician specialist directory. Participants requested paper and online education resources including access to the slides, a website, and “quick tips” handouts. Participants reported reduced barriers, and highlighted the value of specific components including improved networking with subject matter experts and easy access to cancer care information. Supporting the culture of partnership, participants valued aspects such as the “open feedback environment”, “culture of collaboration” and community building.

CONCLUSION
Through analysis of the qualitative data, we identified themes that provide valuable insights for continued improvement of the COP at our community hospital and its networks. Generally, comments were positive, however it is recognized that respondents may be more likely to give positive rather than negative feedback, and that attendees have self-selected to attend.
Abstract #21_CAMO_2017

BASELINE CHARACTERISTICS AS PREDICTORS OF ADJUVANT CHEMOTHERAPY (AC) TOXICITIES IN STAGE III COLORECTAL CANCER (CRC) PATIENTS

Akie Watanabe¹, Charlie Yang², Winson Y. Cheung²
¹Faculty of Medicine, University of British Columbia, Vancouver, BC
²BC Cancer Agency, Vancouver, BC

OBJECTIVE
Toxicities can drive patients to decline or poorly adhere to chemotherapy. We aimed to determine the associations between baseline characteristics such as age, sex, ECOG performance status, tumor location, and comorbidities with toxicity outcomes acquired from adjuvant chemotherapy (AC).

METHODS
We reviewed a cohort of 371 colorectal cancer (CRC) patients treated with adjuvant monotherapy (Capecitabine) or combination therapy (FOLFOX or CAPOX) within 12 weeks of curative resection at the British Columbia Cancer Agency, and determined the associations between baseline characteristics and toxicity outcomes

RESULTS
Among 371 patients, median age was 65 years, 52% were men, and 14% were ECOG ≥2. In this cohort, 41% received monotherapy and 59% received combination therapy. For monotherapy, univariate analyses found that age, sex, ECOG, and pre-treatment anemia were associated with hematological toxicities and tumor location was associated with gastrointestinal (GI) toxicities (P < 0.05). On multivariate analyses, haematological toxicities were predicted by old age (≥70) (OR 3.30, 95% CI 1.17-9.37, P= 0.025) and pre-treatment anemia (OR 23.18, 95% CI 6.36-84.48, P= 0.000), while GI toxicities were less likely to occur with a tumour site at or after the splenic flexure (OR 0.38, 95% CI 0.15-0.99, P= 0.047).
In univariate analyses of combination therapy, sex and pre-treatment anemia were associated with hematological toxicities, while cardiac and/or respiratory comorbidities were associated with neuropathy (P < 0.05). In multivariate analyses, only female sex was predictive of hematological toxicities (OR 5.13, 95% CI 2.08-12.68, P= 0.000) and neuropathy was less likely to develop with cardiac and/or respiratory comorbidities (OR 0.23, 95% CI 0.07-0.81, P= 0.023).

CONCLUSIONS
Specific baseline characteristics are associated with the development of certain side effects. This information can help to further inform AC discussions with patients and caregivers.
Abstract #26_CAMO_2017
PREDICTORS OF ATTRITION IN PATIENTS WITH METASTATIC COLORECTAL CANCER (MCRC)
Arvin Bahrabadi1, Jenny Ruan2, Gillian Gresham2, Winson Y. Cheung3
1University of British Columbia, Vancouver, BC
2British Columbia Cancer Agency, Vancouver, BC
3Department of Medicine, University of British Columbia, Vancouver, BC

OBJECTIVE
Using a population-based cohort of MCRC, our aims were to characterize rates of attrition and determine factors associated with failure to receive each line of MCRC treatment.

METHODS
Medical records of patients who were diagnosed with MCRC from 2008-10 and referred to any 1 of 5 cancer centers in British Columbia were merged with systemic therapy data from the provincial pharmacy database. We classified patients into mutually exclusive treatment categories: a) receipt of all available lines of MCRC treatments; b) attrition directly attributable to disease, such as cancer progression or death; c) attrition attributable to other clinical factors, including toxicity, and d) attrition secondary to nonclinical factors, including personal/social characteristics. Multivariate logistic regression models were constructed to identify predictors.

RESULTS
We identified 525 eligible MCRC patients: median age 64 years, 57% men, 55% Caucasian, 68% ECOG 0/1, 41% and 35% never and ever smokers, respectively. The attrition rate was 40% (95% confidence interval [95% CI], 36%-44%) for first line treatment, 25% (95% CI, 19%-31%) for second line treatment and 14% (95% CI, 5.5%-22.5%) for third line. While cancer progression (31%) and chemo toxicity (30%) were the most common attrition causes, other frequent attrition causes included death (20%) and patient preference (14%). On multivariable analysis, first-line treatment attrition was associated with worse baseline ECOG (odds ratio [OR], 1.92; p<0.001) and older age at diagnosis of MCRC (odds ratio [OR], 1.04; p<0.001). When we examined attrition over all lines, it was significantly correlated with worse ECOG (odds ratio [OR], 2.44; p<0.001).

CONCLUSIONS
Treatment attrition is a prevalent problem in MCRC and can hinder the benefit of applying sequential treatment algorithms. Some causes of attrition are potentially modifiable and may reflect opportunities for patients to maximize exposure to all lines of therapies.
Abstract #59_CAMO_2017
RISK PREDICTION MODELING APPROACH TO IDENTIFY BEST PREDICTIVE PARAMETERS FOR URETHRAL STRICTURES AFTER PROSTATE BRACHYTHERAPY
Singhal S\textsuperscript{1,2}, Jamaluddin MF\textsuperscript{1,2}, Sloboda R\textsuperscript{1,3}, Parliament M\textsuperscript{1,2}, Usmani N\textsuperscript{1,2}.
\textsuperscript{1} University of Alberta Faculty of Medicine and Dentistry, Edmonton, Alberta, Canada \textsuperscript{2}Department of Oncology, Division of Radiation Oncology, University of Alberta, Edmonton, Alberta, Canada \textsuperscript{3}Department of Oncology, Division of Medical Physics, University of Alberta, Edmonton, Alberta, Canada

BACKGROUND & PURPOSE
Urethral strictures are a rare complication of prostate brachytherapy (BXT), with prior studies showing radiation dose to the bulbomembranous urethra being associated with stricture formation. This retrospective case-control study explored clinical and dosimetric parameters associated with BXT-related stricture development.

MATERIALS AND METHODS
A cohort of 34 patients developed urethral strictures after BXT at our institution during 2008-2014. Each case was matched with two controls (68 controls) that had not developed a urethral stricture according to similar baseline International Prostate Symptom Score (IPSS), planned prostate volume, post-implant prostate V150, and post-implant prostate D90 dosimetry parameters. Stricture development was compared with clinical (i.e. age, IPSS, diabetes) and dosimetric (i.e. base, extra-prostatic, 5 mm margin) variables.

Initially, an independent association between all parameters and toxicity was performed, but due to small sample size, nothing was significantly associated. Then, statistical modeling for risk prediction was applied, which included adjusted R2, Mallows’ C Selection (CP), Schwartz’s information criterion (BIC) forward selection (FS), and backward selection (BS) to identify the parameters with predictive ability of toxicity. Cross validation analysis was performed to select the best subset selection on the full data set for predictive parameter selection.
RISK PREDICTION MODELING APPROACH TO IDENTIFY BEST PREDICTIVE PARAMETERS FOR URETHRAL STRICTURES AFTER PROSTATE BRACHYTHERAPY

RESULTS
The results show that R2 statistic increases from 6% (only one) to 33 % (all parameters). The table demonstrates minimum best-fit parameters in different models.

<table>
<thead>
<tr>
<th>Model</th>
<th>Number of parameters</th>
<th>Parameters name</th>
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</thead>
<tbody>
<tr>
<td>Adjusted R2</td>
<td>10</td>
<td>Urethra D5, Urethra D30, IPSS, Urethra V150, Urethra D30 Apex, Age, Hormones, Urethra D5 Apex, Urethra 5mmV150 Apex, Urethra 5mm D30 Apex</td>
</tr>
<tr>
<td>CP</td>
<td>4</td>
<td>Urethra D5, IPSS, Urethra D30, Urethra D30 Apex</td>
</tr>
<tr>
<td>BIC</td>
<td>4</td>
<td>Urethra D5, Urethra D30, IPSS, Urethra 5mm D30 Apex</td>
</tr>
<tr>
<td>FS</td>
<td>5</td>
<td>Urethra D5, Urethra D30, IPSS, Urethra 5mmV200 Apex, Urethra 5mm D30 Apex</td>
</tr>
<tr>
<td>BS</td>
<td>5</td>
<td>Urethra D5, Urethra D30, IPSS, Urethra D5 Apex, Urethra 5mm D30 Apex</td>
</tr>
</tbody>
</table>

Cross-validation with minimum standard error (MSE) identified a model with 5 parameters that included age, baseline IPSS, urethra D30, urethra D5, and urethra with 5mm margin V200 Apex shows best predictive ability for urethral strictures.

CONCLUSION
This modeling approach, which is novel in BXT, helped to identify a combination of parameters with some predictive ability of radiation toxicity. Further evaluation is required to validate the results.