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Management of gastric cancer in Ontario. ***Natalie Coburn,[*] Laercio Lourenco[†] Seana Rossi,[*] Nadia Gunraj,[‡] Lucy Helyer,[§] Calvin Law,[*] Linda Rabeneck,[¶] Lawrence Paszat.[**]*** **From *Surgical Oncology, Sunnybrook Health Sciences Centre, Toronto, Ont., †Surgical Gastroenterology, Universidade Federal de São Paulo/Escola Paulista de Medicina, Brazil, ‡Programming and Biostatistics, Institute for Clinical Evaluative Sciences, Toronto, Ont., §Surgical Oncology, Queen Elizabeth II Health Sciences Centre, Halifax, NS, the ¶Odette Cancer Centre, Sunnybrook Health Sciences Centre and the **Institute for Clinical Evaluative Sciences, Sunnybrook Health Sciences Centre, Toronto, Ont.**

Introduction: Survival in North America is poor for patients with gastric cancer. Few studies have examined processes of care associated with gastric cancer to determine areas in which care and possibly survival can be improved. **Methods:** We identified all cases of gastric cancer in Ontraio, Canada, from Apr. 1, 2000, to Mar. 31, 2005, and describe the demographics of patients, staging of the cancer, treatment and survival. **Results:** In this series of 3666 patients, only 81% of cases had a CT scan performed before resection, with 90% of cases receiving an upper endoscopy. We found that 55% of patients were likely treated palliatively, with only 1645 patients undergoing a resection with curative intent. Of patients who did not receive a resection, over 50% appeared to have a diagnostic laparoscopy rather than a laparotomy. Survival appears to be most related to the type of resection performed, likely reflecting the extent of disease. However, for curative-intent cases, higher institution volume is related to improved survival. **Conclusion:** In this population-based analysis, we found evidence of underutilization of preoperative radiology and endoscopy. Many patients are treated palliatively, reflecting presentation of the cancer at an advanced stage. Survival is related to surgical type, and may be improved if performed in a higher-volume centre.

Quality indicators for gastric cancer surgery: a survey of practicing pathologists in Ontario. Gastric Cancer Pathologist Survey. ***Alia P. Qureshi,[*] C. Andrea Ottensmeyer,[†] Alyson L. Mahar,[†] Runjan Chetty,[‡] Aaron Pollett,[§] Frances C. Wright,[*¶] Natalie G. Coburn.[*†¶]*** **From the *Division of General Surgery, University of Toronto, the †Centre for Health Services Sciences, Sunnybrook Health Sciences Centre, the Departments of Pathology, ‡University Health Network and §Mount Sinai Hospital, and the ¶Division of Surgical Oncology, Odette Cancer Centre, Toronto, Ont.**

Background: Adequate lymph node assessment and R0 resection are critical to the staging and management of gastric cancer. The American Joint Committee on Cancer / International Union Against Cancer (AJCC/UICC) recommend at least 15 lymph nodes (LN) be assessed, and the literature suggests a gross margin of 5–6 cm be achieved. Results of an Ontario general surgeons' survey indicated these standards were not widely known. As oncologic management is highly collaborative, we surveyed pathologists to assess their knowledge of LN assessment and margins for processing gastric cancer specimens. **Methods:** Pathologists were identified using the College of Physicians and Surgeons of Ontario and MD Select databases. Participants were surveyed online or by mail-out. **Results:** Pathologists indicated a goal of assessing fewer than 5 LN (2%), 5–10 LN (27%), 10–15 LN (40%), 15–20 LN (20%) or more than 20 LN (11%). The majority self reported an actual assessment of 5–10 LN (49%), with 88% reporting a number below standards. Additionally, 54% of responding pathologists identified more than 1 cm as an adequate gross margin, and 89% of pathologists indicated a response below literature recommendations. Ninety-four percent of pathologists agreed more education on gastric cancer would be valuable. **Conclusion:** To improve the quality of gastric cancer management, our findings suggest the need for clear, consistent guidelines for adequate gross margin resection length. Furthermore, there is a critical need for education aimed at closing the knowledge gap among practicing pathologists and surgeons regarding current recommended guidelines for LN assessment and adequate margin length.

Malignant triton tumour: a case arising in the prostate and review of institutional experience over 30 years. ***Yarrow McConnell, A. Archibald, A. Covert, C. Giacomantonio.*** **From the Division of General Surgery, Dalhousie University, Halifax, NS**

Malignant triton tumours (MTT) are a subtype of peripheral nerve sheath tumours typified by rhabdomyosarcomatous differentiation and positive staining for myoglobin, actin, desmin and S-100. They are associated with neurofibromatosis type I and radiation exposure, and have been reported in the head and neck, thorax, pelvis and extremities. Knowledge regarding natural history, prognosis and management of MTT are based on case reports and small case series. We present a case of MTT originating in the prostate, a site never before reported in the literature, to our knowledge. The 43-year-old patient presented with urinary retention. There was no history of neurofibromatosis. The patient underwent radical surgery and has had no

locoregional recurrence, but presented with metastatic disease in the lungs 2 years later. In addition, we review the pathology, clinical course and outcomes of patients with MTT cared for at our institution over the past 30 years.

Changing face of thyroid cancer in the province of Manitoba. ***K. Alok Pathak, Andrea Mazurat, Richard W. Nason.*** **From Cancer Care Manitoba and University of Manitoba, Winnipeg, Man.**

Introduction: Thyroid cancer, the most common cancerous endocrine tumour and the most rapidly increasing one according to Canadian Cancer Statistics, is a unique cancer in many regards. **Methods:** A total of 1702 consecutive patients with thyroid cancer were identified as a population-based cohort in the Manitoba Cancer registry (1970–2005) with a median follow-up of 152 months. Outcome of these patients in terms of overall, disease-specific (DSS) and disease-free survival (DFS) was calculated by Kaplan–Meir method, and intergroup comparisons were made by log rank test. The independent influence of age, sex, size of tumour, histology and grade, T, N and M stages, multifocality, extrathyroidal extension and completeness of resection and extent of surgery on DSS and DFS was evaluated by the Cox proportional hazard model. **Results:** Mean age at diagnosis was 48.0 (SD 18.4) years, and 75.3% of the patients were female. A total of 366 thyroid cancers were seen during 2000–2005 as compared with only 160 during 1970–1975, and their 5-year disease-specific survival steadily improved to 95.0% from 75.7%. Overall, 90.5% of patients had differentiated thyroid cancer. Age at diagnosis did not change significantly during this period, and the proportion of dedifferentiated cancers fell from 19.4% (1970–1975) to 5.5% (2000–2005). On multivariate analysis, DSS was independently influence by tumour histology and grade (hazard ratio = 26.1, $p = 0.005$), completeness of resection (hazard ratio = 82.9, $p = 0.020$) and age at diagnosis (hazard ratio = 1.1, $p < 0.001$). **Conclusion:** Thyroid cancer is unique, with age being an independent prognostic factor along with tumour histology and completeness of resection governing disease-specific survival.

Is clinical breast examination, mammography or magnetic resonance imaging the best method for assessing residual disease after neoadjuvant therapy in women with locally advanced breast cancer? ***Frances C. Wright,* J. Zubovits,† S. Gardner,‡ B. Fitzgerald,§ M.L. Quan,* M. Clemons,¶ P. Causer.***** **From the Departments of *Surgery, †Pathology, ‡Public Health Sciences, §Nursing, ¶Medical Oncology and **Radiology, University of Toronto, Toronto, Ont.**

Introduction: Accurate assessment of residual disease after neoadjuvant therapy (NEC) for women with locally advanced breast cancer (LABC) is critical for planning surgical therapy, and both under- and overestimation of residual disease have been described. The purpose of this prospective study was to determine the best method (clinical examination, mammogram, MRI) for assessing residual disease after NEC for women with LABC. **Methods:** All women with locally advanced breast cancer at a single tertiary care cancer centre between September 2004 and May 2007 who received NEC and surgery as part of their treatment plan were enrolled. Patient demographics, tumour size as measured by clinical examination, mammogram and MRI both before and after NEC, and final pathologic size of tumour were collected. Comparison was made between tumour size on imaging and final histology. **Results:** A total of 48 women with 50 LABCs were recruited during the study period. Median patient age was 47 years, and 86% of LABCs were invasive ductal carcinoma. Preoperatively, tumour size was largest on clinical examination (Table). Postoperatively, tumour size was largest on mammogram. The Pearson correlation coefficient between post–NEC measurements and pathology was 0.63 (clinical examination), 0.15 (mammogram) and 0.49 (MRI). In clinical terms, clinical examination underestimated residual malignancy by 1.2 cm ($p = 0.002$), mammogram overestimated by 0.9 cm ($p = 0.15$) and MRI overestimated residual disease by 0.3 cm ($p = 0.53$). **Conclusion:** Magnetic resonance imgaging best assesses residual disease post–NEC for women with LABC. Evaluation to assess for breast-conserving surgery should be performed using MRI and can be offered to a select group of women with LABC after NEC.

Table. Comparison of tumour size pre– and post–neoadjuvant therapy based on imaging technique and final pathology

	Tumour size, mean cm			
Time	Clinical examination	Mammogram	MRI	Pathology
Pre–neoadjuvant therapy	8.2	5.1	6.2	Not applicable
Post–neoadjuvant therapy	2.4	4.3	3.9	3.6

Measuring the quality of sentinel lymph node biopsy (SLNB) for breast cancer in Ontario: a population-based evaluation. ***M.L. Quan,* B.J. Wells,* R. Saskin,† N. Fraser,* F.C. Wright,* D. Urbach,†‡ A. Gagliardi,* D. McCready.§*** **From the *Department of Surgery, Sunnybrook Health Sciences Centre, the ‡Institute of Clinical and Evaluative Sciences, the ‡Department of Surgery, University Health Network, and the §Department of Surgery, Princess Margaret Hospital, Toronto, Ont.**

Background: Sentinel lymph node biopsy (SLNB) is being increasingly used in the treatment of early stage breast cancer across Canada. Previous studies have identified variability in implementation and training of the procedure; however, the quality of SLNB has never been evaluated. We previously developed quality indicators for SLNB that were practical and feasible to measure. Therefore, the objective of this study was to measure the quality of SLNB in the province of Ontario using developed indicators. **Methods:** All patients diagnosed with breast cancer between Jan. 1 and Dec. 31, 2005, who had axillary surgery were identified from the Ontario Cancer Registry. The cohort of patients who underwent an SLNB was then established using administrative data sets at the Institute for Clinical Evaluative Sciences (ICES) supplemented by primary chart abstraction of all cases. The 7 quality indicators were then calculated. The influence of patient, provider and institutional level characteristics on each indicator was determined using generalized estimating equations to account for clustering of patients within centres. All

analysis was performed using SAS 9.1. **Results:** We identified 5134 patients with breast cancer during the study period, of whom 2323 underwent an SLNB. Quality indicators for the entire cohort were calculated (Table). The proportions of cases having appropriate pathology evaluation and reporting were low, as was the proportion of cases with more than 1 node removed. Both the proper identification of the SLNB and performance of SLNB concurrently with primary breast surgery were high, exceeding 90%. As expected, the rate of completion axillary node dissection for positive sentinel lymph nodes increased with the size of metatases and decreased with age. Hospital volume of breast cases, urban/rural and academic/community status were not significant predictors for any of the indicators. Younger patient age was a significant predictor of node positivity ($p = 0.002$) and number of nodes removed (> 1, $p = 0.008$). **Summary:** The overall measure of quality in SLNB practice was high in the province. However, there remains room for improvement, particularly in appropriate pathologic evaluation and reporting, as well as the proportion of cases with more than 1 lymph node removed.

Table. Quality indicators for sentinel node biopsy in breast cancer

Quality indicator	Description	Incidence, %
Axillary node positivity rate	Proportion of patients undergoing SLNB in whom SLNB was identified and found to be positive	28.1
Proper identification of SLN	Proportion of patients in whom sentinel lymph node(s) were identified as "hot" and/or "blue" and/or "clinically suspicious" in the chart or operative note	94.6
No. of nodes removed (>1)	Proportion of patient who underwent SLNB in whom the number of nodes removed is greater than 1	63.7
Pathologic evaluation protocol	Proportion of patients in whom the SLNs were examined using a recognized serial-sectioning protocol	59.1
Pathologic reporting by AJCC guidelines	Proportion of SLNB final pathology reports that report the category of metastases identified and the patterns of tumour present according to AJCC criteria	37.8
SLNB concurrent with lumpectomy/ mastectomy	Proportion of patients who underwent SLNB and lumpectomy concurrently	94.4
Completion ALND for positive SLNB	Proportion of patients with a positive SLNB (as defined by micrometastases greater than 0.2 mm) who received a completion axillary lymph node dissection	91 (macrometastases) 65 (micrometastases) 54 (ITCs)
SLNB performance in ineligible patients	Proportion of patients who undergo SLNB as a stand-alone axillary procedure who are "ineligible" based on preoperative disease characteristics (i.e., inflammatory breast cancer, etc.)	1.9

AJCC = American Joint Committee on Cancer; ALND = axillary lymph node dissection; ITC = isolated tumour cell; SLN = sentinel lymph node; SLNB = sentinel lymph node biopsy.

The role of hepatic resection for breast cancer liver metastases. ***Robert Tasevski,*†* ***Christian Kenfield,‡*** ***Andrew Gogos,†*** ***Neil Collier,†*** ***Benjamin Thomson.†‡***

From the *Department of Surgical Oncology, University of Toronto, Toronto, Ont., the †Royal Melbourne Hospital and the ‡Peter MacCallum Cancer Centre, Melbourne, Australia.

Introduction: Hepatic resection is controversial for breast cancer liver metastases. This study examines our experience with hepatic resection in patients with isolated liver metastases from breast cancer. **Methods:** The medical records of 9 consecutive patients with isolated breast cancer liver metastases referred to a tertiary medical centre between December 1999 and February 2007 were reviewed retrospectively. All patients were female, with a median age of 53 years at the time of diagnosis of the liver metastases. Median follow-up was 31 (range 1–76) months. **Results:** Eight (88.9%) patients were eligible for hepatic resection. In 1 patient, the liver metastases were diagnosed synchronously with the primary breast cancer, and in the other 8 patients, they were metachronous (disease-free interval 3–58 mo, median 32.5 mo). The resections performed included 5 segmentectomies, 2 left lateral sectionectomies and 1 right hemihepatectomy. The margins of resection were clear (R0) in 5 (62.5%), microscopically positive (R1) in 1 (12.5%) and macroscopically positive (R2) in 2 (25%) patients. There were no postoperative deaths or major morbidity. The median disease-free survival was 9.5 months, and the median overall survival was 31 months. Five (55.6%) of the patients remain alive, 3 (33.3%) are dead, and the vital status of 1 patient is unknown. All the patients who underwent an R0 resection remain alive, and the median overall survival is 48 months in this group. The liver was the first site of recurrence in all 3 patients who died. **Conclusion:** Hepatic resection for breast cancer liver metastases can be performed safely with a low morbidity and mortality. Patient selection is critical, as outcome is greatly influenced by the ability to complete the resection with clear margins. In suitably selected patients, hepatic resection may provide a significant survival benefit over medical therapy alone.

Pharmacokinetics of intraperitoneal irinotecan in a pig model. ***Simon Turcotte,*** ***Lucas Sideris,*** ***Rami Younan,†*** ***Pierre Drolet,*** ***Pierre Dubé.*** **From the Departments of Surgery, *Maisonneuve-Rosemont Hospital and †Centre Hospitalier de l'Université de Montréal, Université de Montréal, Montréal, Que.**

Introduction: Few data support the choice of intraperitoneal (IP) irinotecan (CPT-11) for the treatment of peritoneal carcinomatosis. The aim of our study was to evaluate the pharmacokinetics of IP CPT-11 and main metabolites in a pig model. **Methods:** Normothermic IP CPT-11 was delivered in 3 doses (100, 200 and 400 mg) in 11 pigs and intravenously in 2 pigs (200 mg). Liver wedge resections and small bowel anastomoses were performed in 7 pigs. Peritoneal, portal and systemic venous samples were taken at intervals of up to 4 or 8 hours. CPT-11, free and glucuronized SN-38 metabolite concentrations were measured by high-performance liquid chromography. Pharmacokinetic analyses were performed with PK Solutions 2.0 software. Each pig's clinical postoperative course was recorded. **Results:** Mean peritoneal CPT-11 exposures were 31.7 (± 4.9) and 28.5 (± 7.3) times higher than the systemic and portal venous exposures, respectively (area under the curve ratios). During the first 4 hours, peritoneal conversion fraction of CPT-11 into antineoplastic free

SN-38 was stable at 0.04% (± 0.01%). Half of the initial SN-38 peritoneal concentration was eliminated in 3.8 (± 0.6) hours. Severe diarrhea, attributed to glucuronized SN-38 excretion in the bile, hemorrhage post–liver resection and anastomotic leak were not documented during a mean postoperative follow-up of 9.2 (± 2.6) days. **Conclusion:** A high concentration of normothermic IP CPT-11 can be delivered safely with limited systemic absorption. The highest initial CPT-11 dose is important to maximize peritoneal exposure to cytotoxic SN-38. The impact of hyperthermia on CPT-11 pharmacokinetics and metabolism remains to be assessed.

Compliance with clinical practice guidelines (CPGs) for adjuvant chemotherapy in stage I–III colon cancer: experience in 2 Canadian provinces. ***Debrah A. Wirtzfeld,* Lynn Mikula,† Robert Gryfe,† Pietro Ravani,‡ Elizabeth L. Dicks,§ Pat Parfrey,§ Steve Gallinger,† William G. Pollett.§*** **From *CancerCare Manitoba, University of Manitoba, Winnipeg, Man., the †Ontario Familial Colorectal Cancer Registry, Cancer Care Ontario and Department of Surgery, Samuel Lunenfeld Research Institute, Mount Sinai Hospital, University of Toronto, Toronto, Ont., the ‡Clinical Epidemiology Unit, Faculty of Medicine, Memorial University of Newfoundland, St. John's, NL, and Divisione di Negrologia e Dialisi, Azienda Istituti Ospitalieri di Cremona, Italy, and the §Newfoundland Colorectal Cancer Registry and Department of Medicine, Memorial University of Newfoundland, St. John's, NL**

Introduction: Clinical practice guidelines (CPGs) for the adjuvant treatment of colorectal cancer were published by the National Institutes of Health in 1991. The American Society of Clinical Oncology and Cancer Care Ontario have recommended adjuvant chemotherapy for patients with "high-risk" stage II colon cancer. We evaluated differences in concordance with guidelines in patients with stage I–III colon cancer in the Canadian provinces of Newfoundland and Labrador, and Ontario. **Methods:** Clinical data and treatment patterns were assessed in 130 patients from Newfoundland and 315 patients from Ontario diagnosed with stage I–III colon cancer (January 1999 to December 2000). The primary outcome was concordance with guidelines for adjuvant treatment. Factors affecting use of chemotherapy in stage II disease were evaluated. **Results:** No patients received adjuvant therapy for stage I disease. Forty-five of 52 patients (87%) in Newfoundland and 108 of 115 patients (94%) in Ontario received adjuvant chemotherapy for stage III colon cancer. Twenty of 55 patients (36%) in Newfoundland and 44 of 116 patients (38%) in Ontario received adjuvant therapy for stage II disease. Eighteen of 41 patients (44%) in Newfoundland and 30 of 53 patients (57%) in Ontario with high-risk features received adjuvant treatment, significantly higher than patients without high-risk features. There was a strong trend toward using chemotherapy in stage II patients aged 50 years or less, independent of high-risk status. **Conclusion:** Adherence to CPGs for adjuvant chemotherapy in stage II colon cancer was not optimal. This may reflect selection bias of referring surgeons, a paucity of level-I evidence and the belief that other factors such as age may play a role in predicting outcome.

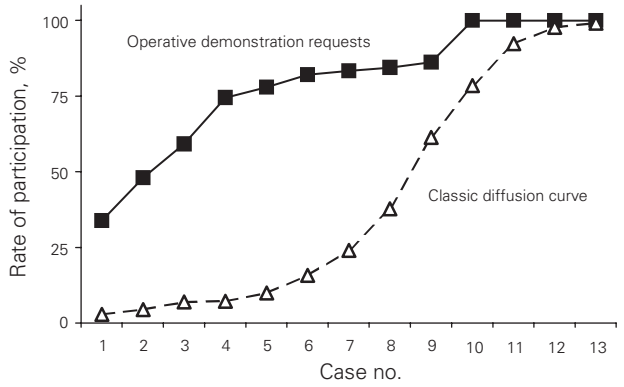
Preoperative chemoradiation for primary rectal cancer: Do patients consider it worthwhile? ***Erin D. Kennedy, Selina Schmocker, Charles Victor, Robin S. McLeod.*** **From the Division of General Surgery, Toronto General Hospital, Mount Sinai Hospital and Zane Cohen Digestive Disease Research Unit, University of Toronto, Toronto, Ont.**

Introduction: Although preoperative chemoradiation for rectal cancer decreases the risk of local recurrence (LR), it does not improve survival and leads to poorer functional results than surgery alone. The objective of this study was to determine how effective chemoradiation needs to be before patients consider it worthwhile. **Methods:** Interviews with healthy volunteers were conducted during which the protocols, risks, benefits and outcomes for chemoradiation and surgery alone were presented. Initially, the participant was asked which option they would prefer when the risk of LR was set at 15% for both chemoradiation and surgery alone. If the participant indicated surgery alone (which was expected), the risk of LR stayed at 15% for surgery alone but was lowered by 1% intervals for chemoradiation until the participant's preference changed from surgery alone to chemoradiation. This switch point represented the risk of LR for chemoradiation the participant would demand before they would accept chemoradiation over surgery alone. **Results:** Overall, 46% (23/50) of the participants would accept chemoradiation if the risk of LR was greater than 5%, and 54% (27/50) would only accept chemoradiation if the risk of LR was 5% or less. Multivariate analysis showed that those who had a higher score on the SF-36 were more likely to require a lower risk of LR for chemoradiation. **Conclusion:** Over 50% of the participants required the risk of LR to be 5% or less before they would accept chemoradiation, which may not be clinically achievable. This has significant implications on treatment decision-making for both patients and physicians.

Rethinking diffusion of innovation research: observations from the Quality Initiative in Rectal Cancer (QIRC) trial. ***Marko Simunovic,* Angela Coates,* Andrew Smith,§ Wesley Stephen,* Dana Reeson,* Lehana Thabane,† Charlie Goldsmith,† Mark Levine.‡*** **From the Departments of *Surgery, †Clinical Epidemiology and Biostatistics and ‡Oncology, McMaster University, Hamilton, and the ‡Division of General Surgery, Sunnybrook Health Sciences Centre, Toronto, Ont.**

Introduction: Research suggests the rate of diffusion of an innovation is influenced by characteristics of the innovation and characteristics of adopters. Also, innovation adoption is slow among the first 20% of individuals in a target group and then accelerates. We assessed these concepts among surgeons in the experimental arm of a randomized trial. **Methods:** The Quality Initiative in Rectal Cancer (QIRC) trial tested if patient outcomes for rectal cancer surgery could be improved by surgeon participation in the multi-intervention QIRC strategy. The most challenging intervention was an intraoperative demonstration (a participating surgeon invited an operative demonstrator to demonstrate optimal rectal surgery). We used surgeon timing in this intervention (a demonstration by case 2) to differentiate 27 early and 29 late adopters of the QIRC strategy. Surgeons completed surveys on perceptions of the QIRC strategy and personal characteristics. **Results:** Nineteen of 56 surgeons (34%) requested an operative

demonstration on their first case of rectal cancer surgery, 42 of 56 (75%) by case 4. Survey results were available for 18 early and 13 late adopters (Figure). These 31 surgeons performed 65% of the



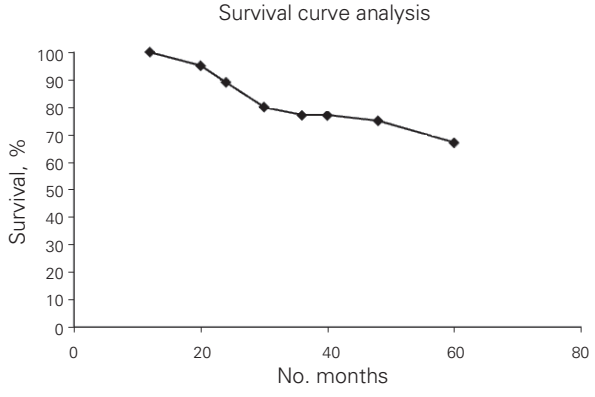
cases in the experimental arm. Early and late adopters had similar perceptions of the comparative advantage, compatibility with values and complexity of the QIRC strategy. There were no differences between early and late adopters in median year of graduation, resource levels (hours of operating room), cosmopolitan nature (frequency of attendance at meetings), willingness to adopt other innovations (laparoscopic surgery for colon surgery) and positive attitude (to health care in Ontario). **Conclusion:** Surgeon adoption of the intraoperative demonstrations occurred more rapidly than expected. Surgeon perceptions of the QIRC strategy and personal characteristics did not differ among early and late adopters. It is likely surgeons are primed for innovation adoption, and traditional diffusion of innovation concepts do not apply to this group.

Quality of life of patients receiving systemic chemotherapy for metastatic colorectal cancer: a prospective study. *Dominique Boudreau, Lucas Sideris, Guy Leblanc, Yves-Eugène Leclerc, Pierre Dubé*. From the Department of Surgery, Maisonneuve-Rosemont Hospital, Université de Montréal, Montréal, Que.

Introduction: Colorectal cancer (CRC) is the second cause of death by cancer in Canada. For stage IV disease, systemic chemotherapy remains the most important treatment, and a large number of studies have been conducted in order to improve survival. However, quality of life (QoL) during these treatments has rarely been an important issue. The aim of this study was to assess QoL of patients with stage IV CRC while receiving systemic chemotherapy. **Methods:** This prospective study was conducted between July 2003 and June 2005. Eligible patients had stage IV CRC nonamenable to surgery and were chemotherapy-naïve. Patients were assigned to irinotecan (CPT-11) or oxaliplatin (OX)–based chemotherapy, according to physician's choice. The SF-36 questionnaire was used to evaluate QoL. A first questionnaire was self administered 24 hours before the first treatment, and then repeated at 2, 12 and 24 weeks after the start of chemotherapy. Results were compared over time to detect any change in the patients' QoL. **Results:** Thirty-four patients were included. Fifteen patients received CPT11–based chemotherapy, and 19 patients received OX–based chemotherapy. No statistically significant difference in QoL for physical and psychological scores was observed over time in the CPT-11–based chemotherapy group. Psychological QoL score did not change in the OX–based chemotherapy group, but we observed a significant decrease in the physical QoL score over time (p = 0.02). **Conclusion:** The physical QoL score decreased over time for patients on an OX–based chemotherapy regimen, and this could be explained by the prolonged neuropathy affecting some patients receiving OX.

Perioperative bevacizumab containing chemotherapy for colorectal cancer liver metastasis. *Mazen Hassanain, Prosanto Chaudhury, Nathaniel Bouganim, Petr Kavan, Peter Metrakos*. From the McGill University Health Centre, Montréal, Que.

Introduction: Patients with colorectal cancer liver metastases (CRCLM), when treated aggressively, have a potential long-term survival. Liver resection combined with oxaliplatin-based adjuvant chemotherapy proved to increase disease-free survival, and neoadjuvant therapy improved progression-free survival. Bevacizumab, when added to oxaliplatin-based chemotherapy, improved median survival in patients with CRCLM. Our goals are to determine safety and efficacy of adding bevacizumab to adjuvant therapy following liver resection for CRCLM and its impact on survival. **Methods:** All patients with detectable liver metastases eligible to receive adjuvant chemotherapy and bevacizumab were reviewed. **Results:** Thirty-six patients were identified, with a median age of 57 years, 31 of whom had synchronous liver metastases. All patients underwent perioperative bevacizumab-containing chemotherapy, oxaliplatin-based in 29 patients and CPT-11 in 7 patients. Seventy-eight percent of patients had neoadjuvant therapy, and all had adjuvant chemotherapy. Median treatment duration pre- and postoperatively was 3 and 6 months, respectively. The overall response rate was 70%: 35% partial and 35% complete response, with a median follow-up of 25 months. No patients progressed before surgery. Overall survival rates at 12, 24, 36 and 48 months were 100%, 89%, 80% and 77%, respectively, and the 5-year median survival was 55% (Figure). Disease relapsed in 3 patients at 4, 5 and



12 months post-treatment, and 2 patients died due to sepsis and disease progression. Grade 3/4 bevacizumab-related complications were seen in 4 patients (epistaxis, anaphylactic reaction and hypertension). The overall complication rate was 28%, with grade 3/4 postoperative complications as per the Clavien system in 2 patients. **Conclusion:** Bevacizumab-containing chemotherapy and hepatec-

tomy is well tolerated and effective in patients with CRCLM. Perioperative bevacizumab-containing chemotherapy seems to be justifiable in selected patients and warrants further investigation in phase-III trials.

Combined sorafenib and yttrium-90 radioembolization in the treatment of advanced hepatocellular carcinoma: preliminary results. ***Prosanto Chaudhury, Mazen Hassanain, Carmine Nudo, Jeanne Bouteaud, Tatiana Cabrera, David Valenti, Peter Metrakos*****. From the McGill University Health Centre, Montréal, Que.**

Introduction: Sorafenib has emerged as the primary treatment for advanced hepatocellular carcinoma. Preclinical studies have shown that antiangiogenic agents create a "vasculature normalization window" during which increased blood flow and decreased tumour hypoxia are observed. This period has been associated with enhanced radiation-induced tumour regression. This provides a rationale combining sorafenib with radioembolisation. We evaluated the safety and tolerability of combining sorafenib (Nexavar) with TheraSphere treatment. **Methods:** Consecutive patients were enrolled if they were not candidates for resection or transplantation. All patients began sorafenib (400 mg by mouth twice a day) at least 7 weeks before TheraSphere treatment and continued sorafenib post-treatment. Dose was adjusted for grade 3/4 toxicities. Follow-up scans and laboratory work were obtained 1 month post–TheraSphere treatment. **Results:** Twelve patients have completed treatment (mean age 61.4 yr). Nine had a Child-Pugh score of A, and all had an Eastern Cooperative Oncology Group (ECOG) status of 0 or 1. The mean alpha-fetoprotein (AFP) pretreatment was 1798 ug/L. Six patients required sorafenib dose adjustment. The most common toxicities were gastrointestinal (diarrhea) and hand–foot syndrome; these were generally self-limited and responded to dose adjustment. No grade 4 toxicity was observed. The mean dose of TheraSphere given was 150 Gy. One patient experienced worsening ascites post-treatment. All tumours demonstrated necrosis. Two patients had partial response by Response Evaluation Criteria in Solid Tumors (RECIST) criteria, and 10 had stable disease. The mean decrease in AFP post-treatment was 1470 ug/L. **Conclusion:** Preliminary results demonstrate the safety and tolerability of combining TheraSphere with sorafenib. All patients demonstrated a radiologic response to treatment. Based on these results, a further phase II study will soon be started.