Journal of Population Therapeutics and Clinical Pharmacology
INCORPORATING FETAL ALCOHOL RESEARCH
Journal de la thérapeutique des populations et de la pharmacologie clinique

Available online at: www.jptcp.com

THE CANADIAN ASSOCIATION FOR POPULATION THERAPEUTICS /ASSOCIATION CANADIENNE POUR LA THÉRAPEUTIQUE DES POPULATIONS PRESENTS:

ABSTRACTS

"DECISIONS IN A TIME OF CHANGE: NEW FRONTIERS IN HEALTH POLICY, HTAS, AND METHODS"

November 1st - 3rd, 2015
Toronto, Ontario
DoubleTree by Hilton
108 Chestnut Street
Toronto, Ontario

CAPT ACTP

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DECISIONS IN A TIME OF CHANGE: NEW FRONTIERS IN HEALTH POLICY, HTAS, AND METHODS

November 1-3, 2015
Toronto, Ontario, Canada

ORAL PRESENTATIONS TUESDAY, NOVEMBER 3, 2015

(Note: Presenting Authors are underlined)

1

No ceiling, no floor: evaluating the effectiveness of a generic cancer drug reimbursement framework

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Background: Public drug program pricing policies for generic drugs typically rely on price ceilings that determine the maximum amount payable. While administratively simple, this approach has been criticized for eliminating price competition and establishing excessively high prices. Tendering or "bulk purchasing" is widely used in the hospital environment, yet rarely used by public drug programs. In the mid-2000's, Cancer Care Ontario (CCO) adopted a new pricing policy that leverages competition in existing hospital group purchasing organization tendering. CCO will reimburse listed products at what is identified as the best available price in the province. The effect of this policy on generic pricing has not been previously described.
Objective: To evaluate the effect of CCO's generic pricing policy on reimbursement prices for drugs funded by the New Drug Funding Program (NDFP).
Approach: NDFP reimbursement prices were reviewed between 2004 and 2014 for nine drugs with generic equivalents to examine initial and cumulative price reductions, time to price reduction, and the current estimated cost savings.
Results: Reimbursement prices initially decreased by an average of 57.6±20.8% over 0.5±0.4 years from the date the first NDFP generic was approved on the Canadian market. Reimbursement prices at the end of 2014 were on average 10% of the original NDFP list price. Based on 2014 utilization volumes, this model delivered an estimated $68 million in savings in the 2014 calendar year.
Conclusions: CCO's generic drug pricing policies have delivered substantial price reductions for generic drugs. This model may be applicable to other drug reimbursement settings.

2

Employment status and mobility before and after bariatric surgery: a one-year prospective sub-study of the Ontario bariatric registry

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Background: To better inform physicians, patients and decision makers, a sub-study of the Ontario Bariatric Registry was conducted to evaluate the impact of bariatric surgery on employment status and mobility.
Methods: A survey was sent to all patients who underwent bariatric surgery at St Joseph Healthcare Hamilton, Ontario, Canada and who completed one year follow-up. Participants were invited to document their employment status at time of surgery and one year after surgery. Patients also completed the EQ-5D.
Results: Out of 309 patients with one-year follow-up, 137(44%) returned the questionnaire of whom 92% were female. Almost three-quarters of the participants were working full time (61%) or part time (13%) at time of surgery and 9% were on disability. Overall, there were no major changes in employment status at one-year following bariatric surgery. However more individuals reported a change in their employment status within one-year following surgery (26%) compared to one-year prior to the surgery (9%) (p=0.0003). In terms of mobility, 70% of participants had slight (34%), moderate (29%) or severe problems (7%) walking

at time of surgery compared to only 10% at 1 year following surgery (p<0.001). Similar statistically significant improvements were also seen in the other four domains of the EQ-5D.
Conclusions: Bariatric surgery has a major impact on mobility. Alternative to common perception, many bariatric patients are working full time pre and post-surgery. More research is warranted to better understand if the changes in employment status following bariatric registry translate into better occupations and income.

3

Costs for childhood cancer, pre-diagnosis and 1-year post-diagnosis: a population-based study in Ontario

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Funding: Funding source: Canadian Institutes of Health Research (Grant #259504); F. Norman Hughes Chair in Pharmacoeconomics, Faculty of Pharmacy, University of Toronto (Dr. Krahn)

Background: Childhood cancer presents unique issues regarding treatment, late effects, and long-term survival, but few studies have reported costs. Cancer costs specific to children are useful for economic evaluations, and planning care.
Methods: Patients diagnosed with cancer at ages 91 days to 14 years from 1995-2009 were identified from Pediatric Oncology Group of Ontario records, and each matched to 3 non-cancer controls. Data were linked with administrative health care databases. Total and cancer-attributable (patients minus controls) resource-specific costs ($CAD2012) during 90 days pre-diagnosis and one year post-diagnosis were estimated using generalized estimating equations for patients with leukemia, lymphoma, central nervous system (CNS), and "other" cancers, who survived >1 year or <1 year post-diagnosis.
Results: Patients (N=4,396) had a mean age of 6 years at diagnosis; 36% had leukemia, 21% CNS tumours, 10% lymphoma, 33% other cancers, and 93.5% survived >=1 year. Pre-diagnosis: mean cancer-attributable cost for all patients was $5,810 ($5,605 for survivors; $8,351 for patients who died <1 year). Combining survivor groups, costs were highest for patients with CNS tumours ($7,441). Post-diagnosis: mean cancer-attributable cost was $125,961 ($122,518 for survivors; $168,525 for patients who died). Overall, the highest cost was for leukemia ($139,499) and the lowest for lymphoma ($97,155). Highest treatment costs were chemotherapy for leukemia, and radiation therapy for CNS tumours. Inpatient hospitalizations represented >75% of all costs.
Conclusions: First-year childhood cancer costs are much higher than those reported in adult cancer studies. Future work will estimate long-term costs, including costs of treatment complications and subsequent malignancies.

4

New drugs for rare disorders: is Canada still condemning sufferers?

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Funding: None

Background: In an analysis of Common Drug Review (CDR) recommendations for 33 drugs published between September 2003 and December 2005, all six drugs for rare disorders received a negative recommendation. A decade later, it is appropriate to review whether any change has occurred in the CDR's evaluation of drugs for rare disorders.
Methods: All submissions with final recommendations for first applications for new indications available on the CDR website at March 31, 2015 were accessed. Information about the date, indication, disease rarity, and recommendation was recorded. For rare disorder drugs, reasons for the final recommendation were examined.
Results: Of 250 final recommendations made between May 2004 and March 2015, 47.6% were negative. However, the negative recommendation rate for the 29 drugs for rare disorders was 65.5%, mainly due to a lack of clinically relevant outcome information and insufficient evidence of cost-effectiveness or significant clinical benefit.

Interpretation: Although the CDR's overall negative recommendation rate has decreased slightly in recent years, it remains much higher for rare disorder drugs. The CDR review continues to be focused on requiring large randomized clinical trials with hard outcomes to provide evidence for clinical efficacy. Most negative recommendations for rare disorder drugs seemed to place greater emphasis on their high cost, rather than their efficacy. Federal and provincial governments need to implement the Orphan Drug Regulatory Framework and coherent nationwide policies to ensure that drugs for rare disorders are funded quickly and equitably so that adequate healthcare is available to all Canadians that need these treatments.

5

The premarket assessment of the cost-effectiveness of a predictive technology "StarticyteTM" for the early detection of oral cancer

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Funding: MITACS Accelerate

Purpose: Although oral cavity is an accessible site for examination, up to 50% of oral cancers are not detected until the disease is well advanced. Hence, early diagnosis and detection of lesions is critical. The current gold-standard, histopathological assessment of a tissue biopsy, can be very subjective. StraticyteTM is a new prognostic tool that uses proprietary protein biomarkers to objectively and more accurately identify patients at high risk for oral cancers. This study assessed the five-year cost-effectiveness of using gold-standard versus gold-standard with StraticyteTM in patients at high-risk of oral cancer.
Methods: A decision-analytic model was constructed to compare gold-standard and StraticyteTM algorithm to gold-standard alone in adults with malignant oral lesions. The analysis was conducted from a private-payer and patient's perspectives, capturing both direct and indirect costs over a five-year time horizon. One-way and probabilistic sensitivity analyses were conducted to investigate uncertainty.
Results: Compared to gold-standard, the algorithm with StraticyteTM resulted in fewer cancer cases (25vs33per100 patients) and slightly lower total costs/cancer case avoided ($3,783.58vs$3,790.51). In terms of cost-effectiveness, the algorithm with StraticyteTM was the dominant strategy (i.e. lower cost, fewer cancer cases). The probabilistic and one-way sensitivity analysis demonstrated that incorporating StraticyteTM to current algorithm would be cost-effective over a wide range of willingness-to-pay values.
Conclusion: Our study found that incorporating StraticyteTM into current algorithm would be slightly less expensive and result in fewer cancer cases over five-years than current gold-standard. However, it is important to take into consideration the limited clinical data on StarticyteTM since this technology is at its early stage in its development life cycle.

6

The effect of Functional Electrical Stimulation (FES) on improving upper limb function in stroke patients: a systematic review and meta-analysis of randomized controlled trials

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Funding: N/A

Background: Stroke is the main cause of functional impairment of the upper limb. Functional electrical stimulation (FES) is used for stroke rehabilitation; however the clinical significance of FES is uncertain. This review assessed the effect of FES on improving upper limb function in adult stroke patients compared to usual care.
Methods: A systematic review of medical databases (MEDLINE, CINHAL, EMBASE, and Cochrane Central Register of Controlled Trials) and grey literature was conducted. Two review authors independently screened studies and assessed trial quality. Data were pooled where appropriate using meta-analytic techniques.
Results: Of the 3266 citations identified, 20 randomized controlled trials (RCTs) were eligible for inclusion. 16 RCTs were included in the meta-

analysis. FES had a large effect on upper limb function compared to usual care. (Standard mean difference [SMD] 0.96, 95% confidence intervals [CI] 0.48 – 1.44). When subgroup analyses were performed, FES had a large effect on upper limb function compared to usual care in acute phase patients (SMD 1.57, 95% CI 1.03 – 2.12). FES had a large effect on upper limb function compared to usual care in patients with mild to moderate paresis (SMD 1.12, 95% CI 0.47 – 1.78).
Conclusions: FES appears to have a large effect on the improvement of upper limb function following a stroke compared to usual care. These findings suggest that FES could be used as an intervention for stroke rehabilitation. However, larger, high quality studies are needed to further evaluate the benefits of FES for stroke patients.

7

Castration-resistant prostate cancer patients in Quebec: medication use in the last year of life

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Funding: None

Background: Recent significant advances have been made in the field of prostate cancer, including many innovative drugs for advanced prostate cancer. The current management of metastatic castration-resistant prostate cancer (mCRPC) has become very complex. The study objective was to describe medication use in the last year of life of patients dying of prostate cancer in Quebec.
Methods: The study cohort consists of patients that became castration resistant and died between 2001 and 2013 in Quebec. CRPC was defined as patients who received chemotherapy, abiraterone, palliative radiotherapy, bone-targeted therapy (BTT) or an anti-androgen. Medication use (CRPC-related and overall) was identified from RAMQ pharmaceutical database by 12-, 6-, 3- and 1- month periods prior to death.
Results: The cohort consists of 1,692 patients who died of CRPC in the study period. A number of 767 (45.3%) and 169 (10.0%) patients received BTT and abiraterone, respectively. Of the patients receiving BTT a t any time, 54.4%, 73.7%, 80.8% and 89.8% received a prescription in the 1-, 3-, 6- and 12-month period before death. Among patients receiving abiraterone at any time, the corresponding figures were: 49.1%, 65.7%, 79.9% and 96.5%, respectively. The percentage of patients receiving androgen deprivation therapy (ADT) in the 1-, 3-, 6- and 12-month period before death were: 10.7%, 59.6%, 74.8% and 83.6%, respectively.
Conclusion: A large proportion of patients maintained their medications in their last months of life. Persistent ADT, BTT, and abiraterone during the last few months of life are common, associated with significant costs yet debatable benefit.

8

Cost effectiveness study on the use of abiraterone in the management of castration-resistant prostate cancer in real-life setting in Quebec

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Funding: This work was funded by Prostate Cancer Canada 2013 Discovery Grant

Introduction: Abiraterone (Abi) was introduced for treatment of castration-resistant prostate cancer (CRPC) after survival benefit was shown in phase-III trials. This study evaluated the cost-effectiveness of the introduction of Abi in the management of CRPC in real-life setting.
Methods: Study cohort was selected from the Régie de l'Assurance Maladie du Québec (RAMQ) databases. It consisted of CRPC patients starting chemotherapy or Abi treatments from 2009-2010 (docetaxel, N=191), defined as pre-Abi, and 2012-2013 (docetaxel+Abi, N=80), defined as Abi eras. Survival was evaluated by Kaplan-Meier, the difference in survival between the two groups by log-rank test. The association between Abi exposure and survival was evaluated by Cox proportional hazards model adjusted for co-variables. The incremental cost-effectiveness ratio (ICER) was obtained by dividing changes in primary therapy costs and survival in the two periods.
Results: Survival was significantly increased in the Ab i vs pre-Abi era, with a 5-months increment

(p<0.0048) and an adjusted hazard ratio of 0.65 (95%CI 0.44-0.96). Mean treatment duration for Abi was 5.63-months and for chemotherapy were 5.1 and 6.5 cycles in the Abi and pre-Abi periods, respectively. Primary therapy cost was on average, for the docetaxel group $5,034/patient and for the docetaxel+Abi group $25,709/patient. As expected, addition of Abi resulted in primary therapy incremental cost, estimated at C$20,675/patient. The ICER was $71,070 per life-year gained.
Conclusion: Our real-life study indicates that patients receiving Abi plus docetaxel had a survival benefit when compared to the group receiving chemotherapy alone. Addition of Abi was associated with an important ICER.

9

Castration-Resistant Prostate Cancer (CRPC): evaluation of the quality of care and disease management in real-life setting

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Objectives: This study aims to evaluate quality of care and healthcare services utilization in the management of patients with CRPC in real-life setting.
Approach: The study cohort consists of patients treated for CRPC at the McGill University Health Center (MUHC) from 2010 to 2014. Individual information on medications, imaging, laboratory tests, medical visits, interventions, emergency visits and hospitalisations were collected. Quality of care was assessed by evaluating clinicians' adherence to Canadian clinical guidelines for CRPC management published in 2013 and other quality of care indicators.
Results: Preliminary analysis of 181 patients indicates that the median age is 74.1 years old (mean age 73.4±8.8). The most common first line treatments were anti-androgens (36.3 %), docetaxel (29.4 %) and abiraterone (10.6 %). For the treatment sequence, 53.1 % of patients received abiraterone at any time point, 35.4 % of those received it post-docetaxel and 16.6% receive d abiraterone only. At the beginning of the study, 28.0 % of patients had bone metastasis. 68.0% of those received bone-targeted therapy (BTTx). In terms of supportive healthcare services, 41.4% of patients had undergone a dental exam before initiating BTTx. 22.3% of patients were referred for psychosocial assistance during the CRPC phase and 49.1% had met a pivot nurse during the first three months of CRPC treatment.
Conclusion: Results indicate that current management of CRPC patients in the MUHC differs from the recommendations of Canadian clinical guidelines for CRPC. Further analyses will allow identifying of factors that are associated with this difference in practice patterns.

10

Impact of initial primary treatment on late regional complications in castration-resistant prostate cancer patients in Quebec

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Funding: Prostate Cancer Canada Discovery Grant

Background: Late regional complications in prostate cancer can impact quality of life and require numerous medical interventions. The objective was to evaluate regional complications in the late phase of castration-resistant prostate cancer (CRPC) by type of initial primary treatment (radiotherapy (RT) or radical prostatectomy (RP)) previously received.
Methods: The cohort consists of patients that died from CRPC between 2001 and 2013 in Quebec, and who underwent previous initial primary therapy (RT or RP). Medical procedures and hospitalizations due to regional complications of CRPC were identified from the RAMQ and Med-Echo databases in the 2-year period prior to death. Kaplan-Meier analysis was used to evaluate the overall survival by initial treatment. Cox regression was used to measure the association between survival and initial treatment adjusted for several covariables. Logistic regression was used to measure the association between initial primary treatment and risk of complications.
Results: The cohort is comprised of 369 patients; 166 and 203 patients had received RT or RP as

initial treatment respectively. The median survival was 7.3 years in the RT group and 7.2 years in the RP group. Overall 44% of patients experienced at least one late regional complication. Use of bone-targeted therapy (OR=0.54, 95%CI: 0.35 to 0.83) was associated with reduced risk of complications, however type of initial primary treatment was not (OR=0.98, 95%CI: 0.64 to 1.53).
Conclusion: The risk of late regional complications in CRPC wasn't associated with the type of initial primary treatment of PCa (RP or RT).

POSTER PRESENTATIONS
MONDAY, NOVEMBER 2, 2015

11

Costs and health-related quality of life associated with managing chronic neuropathic pain in academic pain centres: results from a one year prospective observational Canadian study

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Background: To fill an important gap in the literature, a Canadian multi-centre cohort study was conducted to determine the long-term outcomes of the management of chronic NeP in academic pain centres. A sub-set of patients also answered specific questions to inform policy makers about the economic value of this type of program.
Methods: Baseline demographics and several pain-related instruments were collected at baseline, 3, 6 and 12 months in the main study. A resource utilization questionnaire aimed at determining NeP-related costs and the EQ-5D were collected in the sub-set study of consenting patients. Statistical analyses were conducted to compare outcomes over time and according to responder status.
Results: 298 patients were evaluated. The mean age of the participants was 53.7 (SD: 14.0) years of age, 56% of the participants were female. At intake, the mean duration of neuropathic pain was over 5 years and 40% of patients eligible to work were unable to work. Statistically significant improvements in all pain and HRQoL outcomes were seen between the baseline and one year visits and the number of patients with severe pain decreased by half. Although drug costs following referral to academic pain centers increased over time, utilization decreased for many healthcare resources (e.g. visits to ER decreased by half) which resulted in overall cost savings.
Conclusion: The results suggest that increased access to academic pain centres should be facilitated in Canada as pain management programs by specialists have the potential to save healthcare resources while improving health outcomes.

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Differences in ICERs for common and rare diseases: a case from oncology

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Funding: We would like to acknowledge the support from Emerging Team Grant from the Canadian Institutes for Health Research (CIHR) Promoting Rare-Disease Innovations through Sustainable Mechanisms.

Introduction: Incremental cost effectiveness ratios (ICERs) are used to assess the value for money for new drugs. ICERs for rare diseases have challenges: i) clinical benefit is often uncertain; ii) costs are high; and iii) ICER thresholds are unknown. We aim to quantify the proportion of

ICERs deemed to be cost-effective for rare and common cancers.
Methods: We used the Tufts Medical Centre Cost-effectiveness Analysis (CEA) Registry focusing on cancer studies. Studies that assessed FDA-approved "orphan drugs" for the approved indication were categorized as rare; others were categorized as common. The proportion of common and rare cancer drugs that were cost effective at various ICER thresholds was calculated.
Results: We identified 303 studies that assessed the cost effectiveness of pharmaceutical interventions for the treatment of cancer from 1988 to 2012. These 303 studies reported 701 ICERs. 79% of studies evaluated drugs for common cancers. When all ICERs reported in the studies were considered at a threshold of $50,000/QALY, 58% of ICERs for drugs used for common cancers and 64% of ICERs for drugs used for rare cancers were cost effective (p=0.23). At a threshold of $100,000/QALY, 74% of ICERs for common cancers and 78% of ICERs for rare cancers were cost effective (p=0.35).
Conclusions: The proportion of ICERs that are deemed to be cost effective at $50,000/QALY and $100,000/QALY thresholds do not appear to be significantly different between drugs that treat common and rare cancers.

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Cost-effectiveness of prostate cancer management strategies in Canada
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Background: Prostate cancer (PCa) is the most common non-melanoma cancer among men in Canada and other developed countries. Adoption and diffusion of novel PCa treatments have led to growing economic burden. In United States, economic burden of PCa was estimated at $4.0 billion for 2004. The current literature is sparse on lifetime costs and quality-adjusted-life years (QALYs) of PCa management strategies. The objective of this study was to assess direct healthcare costs and QALYs associated with PCa management strategies in Quebec, Canada from diagnosis to end-of-life.
Methods: A validated Markov Montel Carlo model was used to predict lifetime direct costs and QALYs. State transition probabilities to develop the model was derived from the literature. Health states modeled were: active surveillance (AS), initial treatments (radical prostatectomy or radiation therapy), PCa recurrence, PCa recurrence free, metastatic castrate resistant prostate cancer (mCRPC) and death (cause specific/other causes). Unit costs and utilities were amassed from the literature representing Canadian healthcare system.
Results: AS conferred most QALYs (13.1 years) and was the least costly strategy ($11267) for low risk. For intermediate and high risk, radical prostatectomy and radiation therapy with androgen deprivation conferred most QALYs and were least costly strategies; $20843, 11.6 years and $86560, 10.1 years, respectively.
Conclusions: Public healthcare system in Canada and elsewhere are operating under economic constrains to allocate finite resources to maximize health at population level. To improve efficiency of the healthcare delivery relative cost and QALY conferred by management strategies would be paramount for decision making and patient care

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Clinical efficacy and safety of metformin-based combination therapy with dipeptidyl peptidase - 4 inhibitors versus sulfonylurea in type 2 diabetes mellitus
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Objectives: To compare the safety and efficacy of DPP-4 inhibitors versus sulfonylurea as an added second therapy in patients with type 2 diabetes mellitus inadequately controlled with metformin mono-therapy.

Methods: A systematic review of published randomised controlled trials (RCTs) in any language was performed in MEDLINE, MEDLINE In-Process & Other Non-Indexed Citations, EMBASE, PubMed and the Cochrane Central Register of Controlled Trials from 1980 to June 2015. Two reviewers independently selected the studies, extracted the data and assessed risk of bias. Clinical outcomes were cardiovascular complications, HbA1c % (difference from baseline) and hypoglycemic event rate. A direct comparison meta-analysis using a random effect model was conducted to calculate mean differences in treatment effects and risk ratio (RR) -with 95% confidence interval- between DPP-4 inhibitors and sulfonylurea as add on therapy to metformin.
Results: We identified 11 RCTs meeting the inclusion criteria. The quality of studies was generally good (moderate). DPP-4 inhibitors versus sulfonylurea produced a non-significant difference in HbA1c% difference from baseline (MD=0.06, 95% CI -0.00-0.13, P=0.07), whereas a significant decrease in the rate of hypoglycemic events was observed in favor of DPP-4 inhibitors (RR= 0.15; 95% CI, 0.11-0.22; P<0.00001). There was insufficient data to assess a difference in the risk for cardiovascular disease.
Conclusion: The review shows that in terms of clinical efficacy, there is no significant difference between DPP4-inhibitors and sulfonylurea when either is added to metformin mono-therapy. In contrast, the safety assessment analysis showed a significant decrease in the risk of hypoglycemic events in patients using DPP4-inhibitors.

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Majority of oncology products receive a positive pCODR recommendation in Canada conditional on improved cost-effectiveness

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Funding: None

Background: Identifying decision patterns of health technology assessments can offer valuable insights into the factors that may influence reimbursement. This study examined oncology reimbursement recommendations made by CADTH's pan-Canadian Oncology Drug Review (pCODR) and determined the implications of these recommendations.
Methods: Final pCODR recommendations were identified from 13 July 2011 to 30 June 2015. Only information accessible at www.pcodr.ca and reimbursementdecisions.com were reviewed.
Results: During this time period, 54 indications were reviewed by pCODR; 42 received positive guidance while 12 received negative guidance. Thirty-one of the 42 (74%) indications that received a positive recommendation were recommended conditional on the cost-effectiveness being improved to an acceptable level. There were no observable relationships between tumor type and recommendation. Eight positive recommendations (19%) were made without listing criteria or conditions, while the remaining three were made for a more restricted patient population. More than half (67%) of the negative recommendations were due to insufficient or unclear clinical benefit and economic analysis. The remaining four negative recommendations were based on a lack of clear clinical benefit. Negative recommendations based solely on poor economic analysis were absent.
Conclusions: The majority of pCODR recommendations were positive, conditional on improved cost-effectiveness, with the probability of a positive recommendation increasing with unmet need and strength of the clinical data. All negative recommendations included concerns regarding insufficient or unclear clinical benefit. This study highlights the value placed on unmet need and clinical data.

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An emerging trend for the Common Drug Review recommendations in Canada to explicitly explore price discounts on incremental cost-utility ratios

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Background: With increasing austerity measures in Canada, drug plans are seeking approaches to reduce overall expenditures, placing drug prices under increased scrutiny by payers and health technology assessment organizations. This study examined recommendations made by the Common Drug Review (CDR) to examine whether

the impact of price discounts on incremental cost-utility ratios (ICURs) are formally being considered.
Methods: Final CDR recommendations and pharmacoeconomic review reports from 2014 and available at: www.cadth.ca or www.reimbursementdecisions.com were identified. Recommendations were restricted to 2014 to reflect CDR procedural changes for posting clinical and pharmacoeconomic reports which were effective on April 1, 2013.
Results: In 2014, 30 recommendations were made by CDR; 19 received positive listing with or without clinical criteria and/or conditions, while 11 received negative guidance. Eight recommendations (27%) were deemed complete and made the pharmacoeconomic review report publicly available. Of these, 5 included a CUA, while the remainder included a cost-minimization analysis. All CDR recommendations (100%) that included a manufacturer-submitted CUA mentioned a price decrease in the final recommendation itself or the posted pharmacoeconomic review report. Four CDR recommendations (80%) calculated the impact of various percent drug price reductions on the ICUR. Only one recommendation which assessed a submitted CUA did not include price reduction scenarios; however limitations were noted with the manufacturer's model.
Conclusions: Based on a small subset of recent CDR recommendations, there appears to be an emerging trend of explicitly exploring the potential impact of drug price discounts on the ICUR where feasible.

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Association between depression and discontinuation with antidiabetic drugs

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Funding: Carlotta Lunghi is supported by a PhD scholarship granted by the Fonds de recherche du Québec - Santé (FRQ-S) – Unité SUPPORT du Québec partnership. She was previously supported by a scholarship by the Fonds d'enseignement et de recherche (FER) of the Laval University Faculty of Pharmacy, and by a grant from the Laval University Chair on Adherence to Treatments. Line Guénette is a FRQ-S Clinical Research Scholar - Junior 1 and the recipient of the Jacques de Champlain SQHA-FRQ-S Award. This study was funded by the Laval University Chair on Adherence to Treatments. The Chair was supported by non-restricted grants from: AstraZeneca Canada, Merck Canada, Sanofi Canada, Pfizer Canada and the Prends soin de toi Program.

Background: Depression can influence adherence to self-care recommendations, such as taking prescription drugs to manage type 2 diabetes. The objectives of this study were to measure the association between depression and antidiabetic drug (AD) discontinuation among new users of oral antidiabetic drugs (OADs) and to estimate factors associated with discontinuation among those with depression.
Methods: We used administrative claims data of the public health insurance plan in Quebec to identify a cohort of new OAD users free of depression and aged ≥18 between 2000 and 2006. We followed patients from OAD treatment initiation up to AD treatment discontinuation, ineligibility to the public drug plan, death, or the end of the study. We used Cox regression models to compute adjusted hazard ratios (AHR) of discontinuation and to identify factors associated with discontinuation among patients with depression.
Results: We identified 114,366 new OAD users, of which 4,808 were diagnosed with depression during follow-up. Among patients with depression, 55.4 % discontinued their treatment during follow-up versus 44.5% for those without depression. The AHR of discontinuation was 1.52 (95% confidence interval [CI]: 1.41-1.63). Independent factors associated with OAD discontinuation among individuals with depression included starting treatment with other drugs than metformin (especially polytherapy with insulin), being prescribed the first OAD by a specialist (vs a general practitioner), and younger age (<45 years).
Conclusions: Patients with depression were more likely to discontinue their treatment. Physician should target patients at risk for depression for screening and proper treatment in order to improve diabetes management.

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Patient's adherence to oral anticoagulants in atrial fibrillation

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Background: New oral anticoagulants (NOACs; dabigatran, rivaroxaban, and apixaban) have been shown to be effective alternatives to warfarin in preventing strokes in patients with atrial fibrillation (AF). However, little is known about anticoagulant adherence in clinical practice and whether a difference in adherence exists between once-daily and twice-daily regimens. The study objective was to estimate patient's adherence to OAC and to once-daily and twice-daily NOAC regimens.
Methods: Using data from the Régie de l'Assurance Maladie du Québec (RAMQ) health administrative databases, AF patients who received ≥1 prescription of OAC between 2010 and 2013 were selected. Patient's adherence for each OAC was measured over a one-year period using the Medication Possession Ratio (MPR). Patient's adherence was estimated for all OAC users and for a subgroup of naïve users.
Results: This study included 30,591; 8,641; 4,284 and 1,028 users of warfarin, dabigatran, rivaroxaban and a pixaban, respectively. The mean MPR in % (SD) were 81.0 (25.2); 90.0 (24.5); 89.9 (21.9) and 92.3 (17.9) among all users of warfarin, dabigatran, rivaroxaban and apixaban, respectively. The subgroup of naïve patients included 9,309; 2,717; 1,187; and 69 users of warfarin, dabigatran, rivaroxaban and apixaban, respectively. Among naïve users, the mean MPR in % (SD) were 81.7 (26.4); 86.3 (24.8); 87.7 (24.2) and 87.3 (24.3), respectively.
Conclusions: Adherence level is relatively high for all type of OAC, but seems to be slightly higher among users of NOACs comparatively to warfarin users. Adherence with once-daily regimen (rivaroxaban) was similar to adherence with twice-daily regimens (dabigatran or apixaban).

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Assessment of laboratory testing for monitoring the safety and effectiveness of antihyperglycemic medications in NL primary care practices

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Background: There is limited research assessing the use of recommended laboratory testing to monitor for glycemic control and adverse effects of antihyperglycemic medications. Our objective was to measure the utilization of recommended laboratory tests around the initiation of antihyperglycemic therapy.
Methods: Using the NL Canadian Primary Care Sentinel Surveillance Network (CPCSSN) database, we identified new-users of antihyperglycemic medications between 01Jan2008 and 31March2014. Primary outcomes involved renal function (SCr) and glycated hemoglobin (A1C). Secondary outcomes included hemoglobin (Hgb), B12, and fasting plasma glucose (FPG). We assessed testing frequency, mean time-to-testing, mean results, prior to and following treatment initiation. Multivariable logistic regression was utilized to identify predictors of laboratory testing.
Results: We identified 501 new-users of antihyperglycemic medications: 392(78.2%) initiated metformin monotherapy (METMONOTX), 23(4.6 %) initiated metformin combination (METCOMBTX) and 86(17.2%) did not initiate metformin (NONMET). The proportion of patients with an A1C>8.5% decreased in all groups: METMONOTX (-12.3%), METCOMBOTX (-13.1%), and NONMET groups (-9.3%) ($p<0.05$ for all). We observed significant changes ($p<0.05$, unless otherwise specified) in the proportion of patients receiving one or more tests following initiation of METMONOTX (A1C:+3.6%; SCr:-5.4%; Hgb:-9.9%; B12:-0.5%; FPG:+7.9%), METCOMBOTX (A1C:+26%[p=0.34]; SCr:+26.1%[p=0.90]; Hgb:+30.4%[p=0.57]; B12:-4.3%[p=0.57]; FPG:+17.4%[p=0.55]), and NONMET(A1C:+4.7%; Scr:+1.2%; Hgb:+11.6%[p=0.05]; B12:+2.3%[p=0.94];

FPG:+10.4%[p=0.53]). Mean (SD) time-to-testing following therapy initiation fell within expected limits: METMONOTX= 120(85) days; METCOMBOTX=141(98) days; NONMET=111(95) days. Strong predictors of laboratory testing were not identified.
Conclusions: Our results provide insight into the pattern of laboratory testing of antihyperglycemic medications in primary care and may inform further investigation to optimize testing.

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Determining the citation impact of the Canadian Network for Observational Drug Effect Studies (CNODES) publications: methods and outcomes

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Background: The Canadian Network for Observational Drug Effect Studies (CNODES) conducts research on drug safety and effectiveness. As one measure of success of dissemination through publications, we applied citation metrics. Nearly all quantitative metrics are based on citation counts (the number of times a publication is cited). Consequently, we set out to discover which sources of citation counts were most accurate, comprehensive and current.
Methods: For five CNODES articles (2012-2014), we searched citation tools Web of Science (WoS), Scopus and Google Scholar (GS) through June 2015. To create a comprehensive list, citations from all sources were collected and duplicates removed.
Results: We observed discrepancies in the number of citations found by each source. WoS and Scopus provided useful analysis tools for tracking citations according to variables such as the discipline and country of citing authors, with the United States (22%), Canada (19%) and the United Kingdom (1 0%) ranking in the top 3 of 33 countries. Scopus provided a higher number of citations (102) than WoS (79), though the latter did contribute a few unique citations. GS provided the highest citation count (155) but included duplicates and missed some listed by the others.
Conclusions: The most accurate, comprehensive and current citation count requires careful use of multiple sources. We determined the frequency of CNODES publication citation uptake through Scopus, WoS, and GS tools and identified strengths and limitations. Knowledge of the publication metrics can help inform publication decisions to reach desired audiences and assist in planning further knowledge translation activities.

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Attention deficit hyperactivity disorder medication use amongst adults in Quebec: a drug utilization study

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Funding: Funding for the study was provided by the Canadian Institutes of Health Research grant #103529 (CIHR Catalyst Grant: Post Market Drug Safety and Effectiveness).

Background: Attention Deficit Hyperactivity Disorder (ADHD) medications are used within children and adults. Although drug utilization has been previously examined in children, no such study has been conducted within adults. We therefore aimed to describe the use of ADHD medications in persons aged >18 years.
Methods: We used data from Quebec's public drug insurance plan to identify incident adult users of ADHD medication between January 1, 2001 and October 31, 2010. Incident users were defined as individuals without any ADHD dispensation in the year prior to their first ADHD dispensation (hereby defined as the index date).
Results: A cohort of 16,821 incident users was identified. Over half of patients (54.1%) were female and the median age was 44 years. Incident users were either initiated on methylphenidate (96.7%), atomoxetine (2.6%) or amphetamine (0.7%). Primary care physicians and psychiatrists were the most frequent prescribers of ADHD medication within this cohort (6 2.7% and 25.4%, respectively). Prior to their index date, 23.2% of incident users were dispensed antipsychotics, 30.7% of incident users were dispensed anxiolytics, and 52.0% of incident users were

dispensed antidepressants. Concomitant use of opioid analgesics and ADHD medication was present within 32.5% of individuals.
Conclusions: The adult use of ADHD medication is similar between the sexes, which is unlike the use amongst children which is dominated by male use. There is also a substantial use of psychotropic medication prior to initiating the ADHD medications which may indicate that the ADHD medications are being used as adjunctive treatment for psychiatric symptomatology.

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Diffusion of methodological innovation in pharmacoepidemiology: self-controlled study designs
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Background: The field of pharmacoepidemiology has experienced significant methodological innovation, particularly in the last decade.
Objective: To characterize the adoption of self-controlled (SC) study designs (case-crossover [CCO], case-time control [CTC], case-case-time control [CCTC], self-controlled case-series [SCCS]) in pharmacoepidemiology.
Methods: A systematic keyword and citation search was completed to identify all SC empirical applications in pharmacoepidemiology through to the end of 2013. Sociograms were generated to visualize the co-authorship network, examine components (distinct authorship groups), and identify cut-points (authors whose removal would increase the number of components). Author affiliations were identified to ascribe institutional contributions to the network.
Results: We identified 176 papers (79 CCO, 5 CTC, 1 CCTC, 85 SCCS, 6 combinations), by 763 unique authors. Few applications (n=5) were published before 2001, and half (n=86) were published from 2011-2013. The network comprised 46 components, 31 contained only one paper. The largest component contained 97 papers and was highly interconnected, attributable to similarities in study design (SCCS, 69%), country of institution (Canada, US, UK comprised 57%), and collaborative seminal authors; Farrington (SCCS, 15 papers) and Suissa (CTC, 4 papers) were cut-points in the network. The second largest component comprised 9 papers from Taiwan-based institutions. The third largest component contained 7 papers and seminal authors Maclure (CCO) and Wang (CCTC), with 42% attributed to Harvard University (Boston).
Conclusions: Adoption of SC innovations is increasing, yet no formal recommendations guide their use. Understanding the diffusion of SC designs in pharmacoepidemiology may identify critical factors to develop and disseminate formal reporting guidelines.

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Driving evidence-informed practice in systemic treatment through a patient based funding model
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Funding: Ministry of Health and Long Term Care is the funder for Cancer Care Ontario activities, including volume funding for Systemic Treatment.

Background: A new systemic treatment funding model (STFM) was implemented in Ontario on April 1, 2014, transitioning from lifetime per-case funding to reimbursement based on evidence-informed episodes of care. The effectiveness of the model will be evaluated against key indicators including the percent of patient episodes on evidence-informed regimens (PPEEIR).
Methods: Provincial Disease Site Group (DSG) experts reviewed approximately 1000 chemotherapy regimens administered in Ontario over the two years pre-implementation. Each DSG identified the regimens reimbursed to facilities through the STFM, based on expert opinion of clinical benefit according to treatment intent (curative/adjuvant vs. palliative or both).
Results: Provincial PPEEIR increased from 91.6% for adjuvant courses and 93.2% for palliative-intent patient months at baseline in 2013/14, to 97% for adjuvant regimens and 94% for palliative regimens a year post-implementation. However, requests continue to be received from oncologists requesting additions to the funded-regimens list. A provincial working group was launched to establish a robust definition of “evidence-informed” with standardized criteria for benefit and evidence to guide DSGs in their recommendations. This new definition will be applied to all regimens prospectively and a retrospective review will be conducted of all previously approved regimens.

Conclusion: Knowledge of PPEEIR increases understanding of practice at the system, regional, facility and disease-site level. Refining the definition of "evidence-informed" ensure that funding is based on high-quality trials demonstrating clinically meaningful benefit, Ontarians can be assured of access to treatment approaches with a high level of clinical evidence, which in turn ensures the best clinical outcomes achievable.

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Health system analysis of Chronic Non-Cancer Pain (CNCP) management in Ontario

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Background: CNCP is a complex health problem that imparts a large burden on the healthcare system and health-related quality of life. There is a paucity of information regarding how CNCP is being managed in Ontario.
Objective: To conduct a health systems analysis to determine how, where and by whom CNCP is being managed in Ontario.
Methods: Pain treatment facilities (PTFs), physiotherapists (PTs) and chiropractors were identified through internet searches, Pain Society of Ontario, Insurance Bureau of Canada, Workplace Safety and Insurance Board, and professional associations. Questionnaires were sent to all PTFs (n=501), a sample of PTs (434/7,815) and a sample of chiropractors (659/3,990). Survey results were analysed using descriptive statistics.
Results: The response rate was 9%. The 96 included PTFs operate 5 days/week with an average of 39 new consultations per month with over 540 patient visits per month. There is an average of 63 patients on waitlists with a mean wait time of 7 weeks. The top three pain syndromes treated are low back pain (21%), fibromyalgia (15%), and osteoarthritis (13%). The most common treatments are individual exercise programs, individual physical therapy and massage therapy. PTs, chiropractors and acupuncturists are usually the professionals providing the care in the PTFs.
Conclusion: There was a low rate of return of completed questionnaires. Back pain is the most common pain syndrome being treated. The average PTF has more than 1 new consult/day and more than 6,480 visits/year. CNCP is being provided by a wide range of healthcare professionals using numerous treatment modalities

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Evidence-based analysis of multidisciplinary pain management interventions

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Background: Several Canadian and international clinical practice guidelines endorse a multidisciplinary team approach as the optimal treatment for chronic non-cancer pain (CNCP). However there is little evidence on the efficacy of multidisciplinary pain management interventions (MPMI).
Objective: To determine the efficacy of MPMIs for CNCP.
Methods: A systematic review of randomized controlled trials (RCTs) of MPMIs was conducted to determine the impact of MPMIs on 12 domains including among others pain, physical function, emotional function, quality of life (QoL) and works status.
Results: The systematic review included 71 articles describing 57 unique RCTs evaluating MPMIs. Comparisons to other interventions were mainly medical care alone (43.9%) and medical care plus physical exercise program (24.6%). Almost all studies (86%) were conducted in Europe and 60% evaluated MPMI in back or low back pain. Pain was most frequently reported outcome with 49 studies using 93 different pain instruments followed by physical function (42 studies using 64 instruments) and emotional function (27 studies using 109 instruments) Impact of MPMIs on other domains (e.g. QoL, work status) was less frequently reported. Almost two thirds of the studies concluded that MPMI was

statistically better than standard of care. Due to the heterogeneity across studies and instruments, it was not possible to conduct meta-analyses.
Conclusion: Although MPMIs seem effective, there is a need to standardize reporting for the evaluation of MPMIs and to conduct primary research in Canada to better inform pain management policies within our health system

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Safety alerts as drivers for pharmaceutical opinion program: a pilot study to reduce potential hospitalizations due to preventable drug-drug interactions

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Objectives: Community pharmacists are in a unique position to prevent serious drug-drug interactions (DDIs). This study aims to reduce the occurrence of DDIs associated with potential hospitalizations, offer continuing professional development opportunities while providing a financially viable business model via the Pharmaceutical Opinion Program (POP) in Ontario.
Methods: Information on evidence-based DDIs was disseminated to 51 participating pharmacies via ISMP Canada Safety Alerts. Participants reviewed the alerts, identified and resolved the DDIs through the POP accordingly. The number and types of pharmaceutical opinions submitted by participants before and during study period were collected. Qualitative data was obtained through focus group sessions.
Results: Of the 2577 POPs claimed during study period, 226 were DDIs. A total of 64 interventions were made with respect to evidence-based DDIs. This can be extrapolated to conclude that these interventions might have averted 64 potential hospitalizations or instances of patient harm from DDIs. Qualitative analysis of the focus groups revealed the value of Safety Alerts, which enabled pharmacists to acquire new information or reaffirm existing knowledge of DDIs, and opportunities to further incorporate POP into daily workflow.
Conclusions: Through disseminating evidence-based DDIs via ISMP Canada Safety Alerts, this study offers an innovative strategy to capture and reduce DDIs associated with potential hospitalizations; deliver continuing education to front-line pharmacists; and provide business opportunities through which cognitive services are reimbursed through the POP. The findings highlight growing opportunities to further utilize POP and demonstrate the effectiveness of pharmacists' interventions in resolving DDIs and conferring cost savings.

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Recurrent cardiovascular events among patients with ST-segment elevation myocardial infarction: insights from the AMI-Quebec registry

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Background: Patients with ST-segment elevation myocardial infarction (STEMI) are at increased risk for recurrent ischemic cardio/cerebrovascular events (RICE). We aimed to determine the long-term incidence and characteristics of RICE in STEMI patients.
Methods: In 2003, we completed a retrospective cohort study of all STEMI patients hospitalized at 17 Quebec hospitals. We obtained information on 5-year RICE by data linkage with provincial health administrative databases.
Results: There were complete data on RICE for 858 patients who survived the index STEMI. During their index STEMI, patients with RICE were more likely to have a higher GRACE score and less reperfusion. Two hundred seventy three patients (32%) suffered a RICE resulting in 380 hospitalizations and 22 out-of hospital RICE-related deaths, with 59% (n=224) of the RICE occurring within the first year of the index STEMI. Ninety percent of the RICE-related hospitalizations were due to recurrent cardiac ischemia and 1 77

patients (20.6%) had at least one cardiovascular (CV) intervention. Patients with RICE were older, females, diabetic and had more prior CV event than patients without RICE. Prior CV event (hazard ratio (HR):1.85; 95% confidence interval (CI):1.42-2.41) and age (HR:1.01; 95% CI:1.00-1.02) were significant independent predictors of time to RICE.
Conclusions: Despite the frequent use of in-hospital PCI during the index STEMI (>70%), the incidence of RICE remained high in STEMI patients. Elderly and those with a prior CV event were at increased risk of RICE. Intensive pharmacotherapy and lifestyle modification may be helpful to reduce RICE in these patients.

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Cost-effectiveness of multiparametric MRI and targeted biopsy in diagnosing prostate cancer

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Background: Transrectal ultrasound-guided biopsy (TRUSGB) is the recommended approach to diagnose prostate cancer (PCa). Overdiagnosis and sampling errors represent major limitations. Multiparametric MRI may accurately identify PCa lesions within the prostate. Targeted biopsy (MRTB) detects significant PCa in higher proportion of men and reduces diagnosis of insignificant PCa. Costs and technical limitations still prevent MRTB from becoming the new standard in PCa diagnosis. The goal of the study was to assess whether added costs of MRI outweigh benefits of MRTB in a cost-utility model.
Methods: A Markov model was developed to estimate the incremental cost-effectiveness ratio (ICER) over 5-, 10-, 15- and 20 years. The model takes into account probability of men harboring PCa, diagnostic accuracy of both procedures and probability of being assigned to various treatment options. Direct medical costs were included. ICER below $50,000 per quality adjusted life year gained (QALY) was considered cost-effective.
Results: Following standard TRUSGB pathway, calculated cumulative effects at 5-, 10-, 15- and 20-years were 4.25, 7.17, 9.03 and 10.09 QALY, respectively. Cumulative effects in MRTB pathway were 4.29, 7.26, 9.17 and 10.26 QALY, respectively. Costs related to TRUSGB strategy were $8,027, $11,406, $14,883 and $17,587 at 5, 10, 15 and 20 years, respectively, as compared to $7,231, $10,450, $13,267 and $15,400 for the MRTB strategy. At 5-, 10-, 15- and 20 years, MRTB was the established dominant strategy.
Conclusion: Incorporation of MRI and MRTB in PCa diagnosis and management represents a cost-effective measure at 5-, 10-, 15- and 20 years after initial diagnosis.

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Urban-rural differences in the uptake of new osteoporosis drug formulations

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Background: Rural physicians may be less aware of new drug formulations due to their isolated practice and less frequent direct pharmaceutical promotion. We examined urban-rural differences in the uptake of new osteoporosis drug formulations available on the Ontario public drug formulary: alendronate+vitamin D3 (listed 2007/01), monthly risedronate (listed 2009/06), and risedronate delayed-release (listed 2012/02).
Methods: We plotted the monthly proportion of new formulation claims of all claims with the same drug molecule, from formulary availability until 2014/03. Results were stratified by major urban, non-major urban, and rural region as defined by the Rurality Index of Ontario. Linear regression over the first year since listing was used to compare the rate of uptake, and chi-squared tests were used to compare proportions dispensed between regions.
Results: We identified a regional gradient in uptake for alendronate+vitamin D3 and monthly risedronate (major urban>nonmajor urban>rural). Uptake of risedronate delayed-release was similar between major and nonmajor urban regions, and slowest in rural regions (major urban≈nonmajor

urban>rural). Rural regions dispensed the lowest proportions for all new formulations: alendronate+vitamin D3 (32% major urban, 23% nonmajor urban, 12% rural), monthly risedronate (26% major urban, 21% nonmajor urban, 16% rural), and risedronate delayed-release (21% major urban, 22% nonmajor urban, 13% rural).
Conclusion: We identified significantly slower uptake and lower proportions of new formulations dispensed in rural regions compared to urban regions. Further research examining regional differences in outcomes may provide insight as to whether urban-rural differences in prescribing translate into health disparities between regions.

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Persistent antipsychotic polypharmacy in a Canadian offender population: implications for public health and safety

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Background: The prevalence of psychotic disorders and psychotropic prescribing are high among offenders. Antipsychotic polypharmacy (APP) is linked with excessive dosing and severe side effects, including premature mortality. No research has examined APP prevalence or correlates in a large offender sample. We hypothesize that the prevalence of APP among offenders will be high and be associated with younger age, male sex, Aboriginal ethnicity, schizophrenia diagnosis, lower education, receipt of income assistance, clozapine, anticholinergic, long acting injectable and pro re nata prescription.
Methods: The study cohort consists of all offenders convicted under British Columbia (BC) jurisdiction between 1997 and 2014 (n~250,000). Analyses will be conducted using a comprehensive inventory of data from the BC Ministries of Health, Justice and Social Development. Antipsychotic prescriptions will be extracted from BC PharmaNet, the province-wide system that captures all prescriptions dispensed by community pharmacies and provincial correctional institutions. Multivariable logistic regression analyses will test the strength of the relationship between persistent APP (dependent variable; defined as treatment with the same pharmacologic regimen for ≥ 90 days) and correlates of APP previously identified in the literature (independent variables).
Results: The data for these analyses are currently being assembled at Simon Fraser University. Results will be complete in September. Adjusted odds ratios and 95% confidence intervals will be used as measures of effect size.
Conclusions: Findings will be discussed in relation to their significance for drug safety, public health and public safety outcomes among offenders with severe mental illness and under treatment with antipsychotic medication.

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Ontario dispensing patterns for publicly funded take-home cancer drugs

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Background: Take-home cancer drugs (THCD) (e.g., oral chemotherapy) present new safety and quality challenges to patients and providers. Some provinces restrict THCD dispensing to specialized oncology pharmacies to ensure quality care. In Ontario, THCD may be dispensed from retail pharmacies located in the community, hospital or cancer centre. Provincial access patterns for THCD have not been previously described. Objective: To describe the current dispensing patterns for THCD reimbursed by the Ontario Drug Benefit (ODB) Program.
Approach: ODB claims were reviewed for the 2013/14 fiscal year. Drugs were classified based on drug identification number (DIN) as THCD and sub-categorized as chemotherapy, hormonal or supportive care drugs. Variables examined included claims volume by pharmacy and drug type, and government costs.
Results: In 2013/14, 4055 pharmacies (community = 4008, hospital=41, cancer centre=6) processed 501,905 claims for 233 DINs classified as THCD, representing 0.34 % of all ODB claims and 5% of overall ODB expenditures. 87.5% of claims were processed by community pharmacies, 8.2% by cancer centre pharmacies and 4.3% by hospital pharmacies. Cancer centres dispensed on average 132 prescriptions/week per pharmacy compared to an average of 2 prescriptions/week per community pharmacy. The majority of THCD

claims (64.3%) were for hormonal drugs while the majority (56.1%) of the government's cost were for chemotherapy claims.
Conclusions: While cancer centres are dispensing high volumes of THCD, community pharmacies are likely the primary access point for Ontario patients. These findings may have implications on quality and safety initiatives for THCD prescribing and dispensing in Ontario.

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A cost-effectiveness analysis of mailed FOBT kits to previous responders recalled for screening

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Funding: N/A

Background: ColonCancerCheck (CCC) is a screening program launched in 2008 in Ontario aimed at reducing colorectal cancer (CRC) related deaths. Screening with the guaiac fecal occult blood test (FOBT) has been shown to reduce CRC associated morbidity and mortality. A pilot study looked at the cost-effectiveness of mailing an invitation to screen along with an FOBT kit, comparing it to a group that was mailed an invitation alone. The current study will evaluate the cost-effectiveness of adding an FOBT kit to a mailed invitation for recall compared to a mailed invitation for recall alone increases participation among patients who had responded previously to a mailed invitation for CRC screening.
Methods: Eligible patients were randomly allocated to one of the two interventions: (1) Mailed FOBT kit and mailed invitation for recall from their family physician (intervention group) OR (2) mailed invitation alone for recall (control group). Resources and costs associated with each group will be identified and quantified. Resources will be stratified into fixed costs, variable or recurrent costs and staff costs.
Results: The results will show whether the addition of the FOBT kit to the mailed invitation is cost effective when compared to a mailed invitation only. Overall costs for each group will be determined, and the cost per patient will be reported. Cost drivers will be identified by conducting sensitivity analyses.
Conclusions: This cost effectiveness analysis will help determine effective strategies for screening programs that are needed to reduce CRC mortality at a population level.

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Severe hyperglycemia among older patients on calcium channel blockers compared to beta-blockers: a population-based case-crossover study

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Background: Calcium channel blockers (CCBs) and beta-blockers (BBs) are frequently administered to patients with diabetes. Studies investigating the risk of new onset diabetes have yielded inconsistent results and the short-term risk of severe hyperglycemia is not well-understood. We sought to understand the immediate risk of severe hyperglycemia among those started on CCBs compared to BBs, medications with similar indications.
Methods: We conducted a case-crossover study using the health administrative databases in Ontario, Canada. We included all patients aged ≥66 years who received a new prescription for a CCB or BB between April 1, 2002 and March 31, 2011; and who required an emergency department visit or hospital admission for hyperglycemia. We compared their risk of starting the medication in the 2 weeks (risk period) or 6-8 weeks (control period) preceding the outcome.
Results: 13,076 individuals were treated with hyperglycemia requiring an emergency department visit or hospital admission. Of those, 45 and 36 were started on new prescriptions of CCB and BB respectively. Among CCB patients, 25 experienced the primary outcome during the risk period compared to 20 during the control period (Hazard Ratio 1.25, 95% Confidence Interval (CI) 0.69 to 2.25). Among BB patients, 28 and 8 patients experienced the primary outcome

during the risk and control periods respectively (Hazard Ratio 3.5, 95% CI 1.60 to 7.68).
Conclusions: This case-crossover study found no increased risk of severe hyperglycemia among patients recently prescribed CCBs. The increased risk observed among individuals on BBs, however, warrants further study.

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Development of a cost-utility model of a pharmacogenomic test for the diagnosis of statin-induced myopathy in cardiovascular high-risk patients initiating a statin
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Background: A leading cause of statin interruption is statin-induced myopathy which has a reported incidence rate ranging from 10% to 20%. The objective of the present study was to assess the economic value of a pharmacogenomic (PGx) test for the diagnosis of statin-induced myopathy.
Methods: Using a Markov model, we evaluated the incremental cost-utility ratio (ICUR) of a PGx test costing $250 to diagnose statin-induced myopathy from the perspective of the Ministry of Health. We assumed that only patients who experienced muscular skeletal pain (MSP) are tested and that patients and physicians are fully compliant to the test results. We further assumed that in an environment without a PGx test, all patients experiencing MSP interrupt their statin.
Results: The results of the model show that the PGx test remains nearly cost neutral even with an imperfect PGx test having 20% of false positive and false negative rates (i.e., incremental cost of $85) yielding an incremental cost- utility ratio (ICUR) of $451 per quality-adjusted life year (QALY). Deterministic sensitivity analyses show that the most influential model parameters are associated with statin efficacy. The results of the probabilistic sensitivity analysis show that, at a willingness-to-pay of $5,850 per QALY, 90% of the model simulations favor the PGx test strategy.
Conclusions: The model shows that a PGx test for the diagnosis of statin-induced myopathy in patients with MSP having ≤20% of false positive and false negative test results, is an optimal strategy at all accepted conventional willingness-to-pay ICUR thresholds.

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Collaborative care model involving eHealth to improve treatment adherence and health outcomes of patients with gout
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Background: The prevalence of gout is increasing and despite availability of efficacious therapies, the condition persists with sub-optimal clinical outcomes due largely to medication non-adherence.
Methods: This is a proof-of-concept, longitudinal observational study using an interdisciplinary care approach involving rheumatology, pharmacy, and dietetics that takes advantage of eHealth technology to improve outcomes in gout. Shared electronic medical records between remotely located health care providers forms a "virtual clinic" and facilitates the exchange of patient information and care team communication. Eligible patients are adults age ≥ 19 who have been diagnosed with gout by a rheumatologist for ≥ 1 year, ≥ 1 flare in the past year, and serum uric acid (SUA) > 360 µmol/L within past 2 months. Our objective is to evaluate the impact of the virtual clinic on: 1) SUA levels (target < 360 µmol/L); 2) medication adherence; 3) functional status; and 4) quality of life; assessed at 0, 3, 6, and 12 months. Target enrollment is 50 patients.
Results: Preliminary results on 16 patients enrolled from 3 rheumatology clinics since Feb 2015 show that 86% are males, mean age 56 years (SD 15). All patients were prescribed allopurinol for gout. At baseline, 36% have 'low' adherence, and average SUA was 454 µmol/L. Most recent average SUA was 371 µmol/L. To date, pharmacy has provided 31 consultations and dietetics 6 consults.
Conclusions: A virtual, interdisciplinary clinic for gout management appears to be feasible with preliminary data showing improvement in SUA.

Further analyses are needed to ascertain the benefits.

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Trends in private payer annual drug plan maximums using real world data

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Background: Over the past few years, there has been increased interest among private payers to introduce annual drug plan maximums (ADPM). Limited research is available to quantify the uptake within plans in Canada. The objective of this study is to examine private drug plan trends in applying ADPM using real world claims data.
Methods: Transactional level rejected claims from various private payer drug plans were pooled from 2010 to 2014. Only claims rejected for ADPM exceeded were included. Trends were also assessed based on the size of each private plan, namely small (>50), medium (50-500) and large groups (500+).
Results: 2,334 unique payer groups with more than 180,000 ADPM rejected claims were included in study. Over the 4-year period, the number patients who exceeded their ADPM increased by 16% while the overall population studied decreased by 3%. The number of groups with at least one patient exceeding the ADPM has increased by 38.9% over the study period. Among these groups, the likeliness for a patient to reach the ADPM was between 10 to 16 times higher when covered by a small group drug plan compared to a large group.
Conclusion: The occurrence of patients exceeding the ADPM within private payer drug plans has increased over the last 4 years. Whether this trend is due to an increase in high-cost claimants exceeding the ADPM, a higher adoption of ADPM by payers or a decrease in ADPM limits is unknown and requires further investigation

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Cost of lab-confirmed influenza requiring hospitalization in Canada

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Background: Influenza is a common infection causing morbidity, mortality, and strain on limited Canadian healthcare resources. Hospitalization of severe cases is the largest component of medical costs attributable to influenza. The cost of lab-confirmed influenza requiring hospitalization and determinants of that cost were explored using clinical, outcomes, and resource use data collected by the Serious Outcomes Surveillance Network of the Canadian Immunization Research Network.
Methods: The total cost per case of hospitalization with lab-confirmed influenza during influenza seasons 2010--2013 was estimated by applying unit prices for physician services and outpatient medications from standard sources. For hospital resources (emergency room, general/ intensive ward stays, laboratory/ diagnostic tests, procedures, and antibiotics/antivirals), prices, including hospital overheads, were obtained from an Ontario hospital with a corporate hospital costing model. Multiple imputation was applied for components of cost not collected during some seasons to preserve appropriate estimate variation.
Results: Average hospital stay was 10.8 days (95%CI: 10.3; 11.4) for 2,951 adults admitted to 18 Canadian hospitals. Of these, 14.6% were admitted to an intensive care unit. The average cost/case was $14,700 ($13,930; $15,470). This includes pre-hospitalization costs ($130 [$120; $150]), hospitalization costs ($14,110 [$13,360; $14,850]), and costs associated with readmission within 30 days ($460 [$280; $640]). After adjusting for age and comorbidity, cases in Western Canada had higher cost than those in Central Canada.
Conclusions: Influenza is associated with considerable healthcare cost in Canada. Further analyses will more fully account for determinants of variation in costs and validate results using prices from another province.

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Refining the definition of "evidence-informed" regimens in Ontario's systemic therapy funding model (STFM)

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Background: Beginning April 2014, Cancer Care Ontario began to fund only “evidence informed” regimens for adjuvant/curative and palliative therapy. Disease Site Group (DSG) Chairs reviewed over 1000 treatment regimens and recommended those perceived of clinical benefit and CCO has currently posted them at www.cancercare.on.ca/STFM. Requests for additional regimens were challenging to adjudicate because of clinical trial design and size, magnitude of clinical benefit, degree of toxicity, amongst other issues.
Methods: A working group consisting of academic and community-based oncologists, pharmacists and New Drug Funding Program (NDFP) personnel recommended that regimens undergo a review similar to that of the pan Canadian Oncology Drug (pCODR) review but without cost-effectiveness analysis, as the requested regimens were predominantly for older drugs.
Results: The “evidence-informed” definition requires regimens to meet an unmet clinical need, demonstrate clinically meaningful and statistically significant improvement in survival (OS, PFS) and/or toxicity, and/or quality of life compared to currently funded alternatives. The hazard ratio for OS or PFS should be less than 0.8. Evidence of benefit should be derived from prospective clinical trial(s) with an appropriate comparator in the Canadian context. Phase II trials will be considered for uncommon tumors but not Phase I.
Conclusions: By raising the bar on the definition of “evidence informed”, it is anticipated that only the most clinically beneficial regimens will be used in the province of Ontario. Further work will now begin to ensure that these regimens are used in the most cost-effective way, taking account of patient preference and convenience.

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An interim analysis of resource utilization and medical management of patients with idiopathic pulmonary fibrosis (IPF) in Ontario

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Introduction: Idiopathic pulmonary fibrosis (IPF) is a chronic fibrotic disease, characterized by scarring of the lungs leading to poor lung function and decreased oxygen exchange. Current therapies include supplemental oxygen, rehabilitation and medications such as corticosteroids and pirfenidone. Individuals with IPF utilize a number of health system resources but the medical management of IPF has not been well quantified. The objective of this study was to collect health care resource utilization (HCRU) in the management of IPF patients.
Methods: A chart review analysis of anonymized IPF patient records is being conducted to collect HCRU data from a major IPF treatment centre in Ontario. A cohort of 90 IPF patients was selected for whom demographic and resource data were collected.
Results: For the interim analysis, charts were reviewed for 45 IPF patients. 67% were male with the mean age at diagnosis being 71 years. The overall cost of the cohort was $873,936, with a mean cost per patient of $19,421. IPF treatments accounted for more than half the total cost. Patients were stratified by disease severity at diagnosis and followed over progression. 33 were diagnosed as initially having mild disease had an average per patient cost of $20,029. 12 had moderate disease and had an average per patient cost of $17,747
Conclusions: Interim results from a major IPF treatment centre indicate substantial HCRU associated with IPF management. The authors plan to complete data extraction at the centre in order to determine HCRU and cost results for the full cohort.

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Costs of personnel involved with radiation therapy using administrative databases

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Background: The objective was to determine costs of medical personnel involved with radiation therapy (RT) using Ontario administrative databases.

Methods: A cohort of women diagnosed with primary breast cancer (BC) (ICD-9 174.x) was identified from the Ontario Cancer Registry (2007-2010) with up to one year follow-up timeframe. Radiation oncologists bill patient visits to the Ontario Health Insurance Plan (OHIP). Radiation therapists record planning and treatment workloads (conventional and intensity modulated RT or IMRT) using National Health Productivity Improvement Program (NHPIP) activity codes in the Activity Level Reporting (ALR) database. An hourly wage was then applied to determine costs.
Results: We identified 30,338 women diagnosed with primary BC, 86% (N=26,121) of whom visited a radiation oncologist. The total number of visits was 165,060 and the total cost was $26.5 million. Approximately 62% of the cohort received planning (N=18,859) and treatment (N=18,758) for conventional RT by radiation therapists and the total planning and treatment cost for conventional RT was $9.0 million and $5.3 million, respectively. For IMRT planning (N=1,631) and treatment (N=5,883), the total planning and treatment cost for IMRT was $258,239 and $3.7 million, respectively. Therefore, the overall cost of radiation oncologist and RT visits was $44.8 million.
Conclusions: Personnel costs for delivering RT to BC patients in the first year after their diagnosis are significant.

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Generating costing algorithms for oncology drugs using administrative databases

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Background: To generate costs and costing algorithms for treatment and supportive drugs in oncology using provincial (Ontario) administrative databases.
Methods: A cohort of women diagnosed with breast cancer (BC) (ICD-9 174.x) was identified from the Ontario Cancer Registry (2007-2012). Firstly, the Ontario Drug Benefit Formulary (ODBF), New Drug Funding Program (NDFP) and Activity Level Reporting (ALR) databases was used in which BC-specific treatments (chemotherapies and hormonal therapies) and supportive (four classes) drugs were identified. Secondly, overall and per patient drug utilization was determined. Thirdly, unit costs were applied to calculate the overall and per drug costs. Lastly, costing algorithms were generated to conduct the costing analyses.
Results: We identified 30,338 women diagnosed with BC. Preliminary results have identified BC-specific drugs in the ODBF, NDFP and ALR databases. All chemotherapies and hormonal therapies have been named as well as anti-nausea, pain (opioid and non-opioid), anti-infectives, and blood products for supportive drugs. Outputs include number of patient cases with at least one treatment or supportive drug being utilized. Iterative test outputs for utilization and costs include means, medians and ranges.
Conclusions: We have generated costs and costing algorithms for oncology drugs in BC and next for colorectal cancer. These costing algorithms will allow for the calculation of oncology treatment and supportive drug costs in different cancer cohorts

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Determining proton pump inhibitor prescription dispensing patterns for Nova Scotia seniors pharmacare program beneficiaries

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Background: Proton Pump Inhibitors (PPIs) are frequently prescribed, often potentially inappropriately. The Screening Tool for Older People's Potentially Inappropriate Prescriptions (STOPP) for PPIs was adapted to examine the discontinuation, dose reduction or switch to H2 Receptor Agonist (H2RA) at 60 days. Objectives were to 1) determine PPI dispensing patterns at 60 days after initial dispensing for Nova Scotia Seniors' Pharmacare (NSSPP) beneficiaries newly dispensed PPIs, and 2) assess patients' predictors for continued dispensing of PPIs 60 days after newly being dispensed high dose PPIs. Our

retrospective cohort study included NSSPP beneficiaries ages ≥66 newly dispensed PPIs from January 1, 1996 - March 31, 2011. Patients excluded had risk factors for long term PPI use including cancer, NSAID use or a recent gastrointestinal bleed. The main outcome measure was adherence to adapted STOPP criteria. Descriptive statistics and logistic regression analysis were performed. At baseline, of the 14,453 participants included for analysis, 89.8% and 10.2% were dispensed low dose and high dose PPI respectively. Many PPI prescriptions dispensed for NSSPP beneficiaries fail to adhere to the STOPP criteria. Of those beginning on low PPI dose, 1.6% switched to high dose, and 40.9% stayed on low dose at 60 days. Of those beginning on high PPI dose, 10.3% switched to low dose, 26.4% stayed on high dose at 60 days. Multivariate logistic regression revealed three risk factors for failure to adhere to the STOPP criteria for patients prescribed high dose PPI: Patient age ≥ 86, rural residency, and hospitalization at the time of cohort entry

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Examining best supportive care resources and costs in refractory/relapsed psoriasis patients

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Background: Psoriasis is a life-long disease with real-world treatment and outcomes data not well studied. Objectives of a pilot project were to collect medical resource use, including laboratory monitoring, physician visits, and psoriasis treatments, to determine direct medical costs.
Methods: A retrospective chart review study was conducted for 40 psoriasis patients at a Canadian academic dermatology clinic who had a Psoriasis Area and Severity Index (PASI) score ≥8 or body surface area ≥10% and were previously treated with systemic therapies. Demographics, disease scores, psoriasis treatments, physician visits, and laboratory tests were collected. Data were stratified into phases of care: pre-biologic and biologic. Descriptive statistics were used to characterize findings.
Results: The cohort was predominantly male with a mean PASI score of 20.0 and mean body surface area of 18.1%; 70% received ≥2 biologics. During the pre-biologic phase (n=33), laboratory tests had the highest mean cost per patient per month at $56, followed by physician visits ($40) and systemic treatments ($34). During the biologic 1 phase (n=40), etanercept was the most prescribed biologic (53%). Biologics had the highest mean cost per patient per month at $2,461, followed by physician visits ($25) and laboratory tests ($25). During the biologic 2 phase (n=28), adalimumab was the most prescribed biologic (46%). Biologics had the highest mean cost per patient per month at $1,943, followed by physician visits ($17) and topicals ($16).
Conclusions: The costs and resource use in psoriasis patients increased over time/phase as current agents have limitations.

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Canadian public reimbursement of subsequent-entry biologics (SEBs)/ biosimilars

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Objectives: i) describe the new Common Drug Review (CDR) evaluative process for SEBs by the Canadian Agency for Drugs and Technologies in Health (CADTH); ii) compare the Canadian Drug Expert Committee (CDEC) recommendation from the first monoclonal antibody SEB (infliximab SEB; Inflectra) in Canada with the regulatory approval from Health Canada; iii) explain the role of the pan-Canadian Pharmaceutical Alliance (pCPA); and iv) compare reimbursement of Inflectra with the reference infliximab (Remicade).
Methods: CDR's SEB submission procedures were retrieved from CADTH's website to delineate its history. The CDR recommendation of Inflectra was compared to Health Canada's approved indications. The pCPA website was examined for the status of Inflectra in negotiations. Formulary reimbursement status and criteria were retrieved, where available, from public formularies and compared with the reference product.
Results: CDR's current SEB submission procedure is significantly different from that of non-SEB products. CDR's recommendation for Inflectra included comments on clinical evidence demonstrating similar efficacy and safety to the

reference product. Indications recommended for reimbursement by CDR are consistent with those from Health Canada. Inflectra is currently undergoing negotiations at the pCPA, to be followed by public plan reimbursement decisions. **Conclusions:** The first monoclonal antibody SEB received a positive CDR recommendation, aligned with the Health Canada-approved indications, in part based on comparative clinical data demonstrating similar efficacy and safety. Non-monoclonal antibody SEBs lacking comparative phase III clinical studies have recently been approved by the European Medicines Agency. The CDR's assessments of these products will be of great interest

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Castration-resistant prostate cancer management in a real-life setting in Quebec

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Introduction: Systemic treatment of castration-resistant prostate (CRPC) has evolved considerably in the last decade. Our study aimed to analyze healthcare services utilization, clinical outcomes and survival trends in the Quebec management of CRPC in a current real-life setting.
Approach: The study cohort consisted of 6,570 patients with evidence of CRPC from January/2001 to July/2013, selected from the Régie de l'Assurance Maladie du Québec (RAMQ) databases. Survival was evaluated by Kaplan-Meier and the difference in survival between pre-Doc and Doc (2002-2004 vs 2005-2013) era by log-rank test. The association between Doc exposure and survival was evaluated by Cox proportional hazards model adjusted for several co-variables.
Results: In our study cohort, the overall distribution of first line therapy was: 19.15% chemotherapy, 54.63% maximal androgen blockade (MAB) alone, and 1.65% Abiraterone. Chemotherapy utilization was 11.93% in the elderly (>75) and 34.07% in younger patients (≤ 75). Overall use of chemotherapy was increased in the Doc (21.5%) vs pre-Doc (16.9%) periods. Survival in the Doc group was improved with an average of 4 months increment (P=0.057) and an adjusted hazard ratio of 0.84 (95%CI: 0.73-0.97) when compared to the previous standard chemotherapy.
Conclusions: Chemotherapy usage increased in the Doc era but is still limited to a minority. In our study, age seems to impact therapy selection. Use of Doc resulted in improved survival, similarly to trial results. These findings are encouraging and suggest that the increase survival observed with newly approved CRPC drugs in phase-III studies may also translate in real-life outcomes.

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The Ontario MedsCheck Diabetes pharmacist medication review service: a descriptive analysis of service recipients between 2010-2014 using administrative claims data

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Background: A MedsCheck Diabetes (MCD) consultation is a pharmacist-led medication review service funded by the Ontario government for people with diabetes. Pharmacists are remunerated $75 for an annual review (limit 1 per year) and $25 for follow-up assessments. We sought to describe the demographic and clinical characteristics of MCD service recipients. This cohort study leverages linked administrative claims data from September 13, 2010 (inception) to March 31, 2014, including the Ontario Drug Benefit program data where MCD services are recorded using a Product Identification Number (PIN). Descriptive statistics were calculated for recipient characteristics and stratified by age and sex. The MCD service was provided to 406,694 Ontarians (45% seniors, 54% male) since inception. Over 95% of MCD services delivered were annual reviews versus follow up assessments. 2011-12 was the highest service delivery year (126,538 recipients) since the service began with a very slight decline overall in subsequent years, more prominent amongst those 66 years and older. Nineteen percent of recipients were identified as

immigrants. Seven percent of recipients had experienced a hospitalization or emergency department visit 30 days before MCD. In the year prior to MCD, recipients 66 years and older received an average of 10 prescription drugs and 9% had high medication costs ($4000+). In under four years, approximately 25% of Ontarians living with diabetes have received an MCD. Few recipients received a follow up assessment. Initial uptake of MCD service was rapid, however, the number of persons receiving the service over time is decreasing, especially among older Ontarians.

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Health utilities in Ontario adults with chronic pain

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Background: We aimed to estimate utilities using a population based sample of adults with chronic pain and examine the contribution of several variables.
Methods: Health Utilities Index Mark 3 values, self-reported race/ethnicity and presence of arthritis, back problems, migraines, heart disease, stroke, diabetes and cancer were obtained from Ontario survey responses of the Canadian Community Health Survey 2009-10. Income, aggregated diagnosis groups (ADGs, a measure of co-morbidity), age and sex were obtained from linked healthcare administrative data. Weighted regression was used to investigate the impact of variables on utility.
Results: A total of 4,116 people with chronic pain were identified from 15,901 adults 18 – 64 years. Mean age was 45.4 years (95%CI 44.7 – 46.2) (54% female). The mean number of ADGs was 4.1 (95%CI 3.9 – 4.3). People with chronic pain had a weighted mean utility of 0.618 (95%CI 0.602 – 0.633), 0.217 points below the overall weighted sample mean (0.835). Increased income was associated with an increased utility ($p<0.001$). Presence of migraine, back problems, arthritis, stroke, heart disease, diabetes, cancer and an additional ADG were associated with a decreased utility (all $p<0.01$). Age, sex, black race and Aboriginal ethnicity were not associated with a utility change.
Conclusions: A utility decrement of 0.217 from chronic pain is larger than seen with heart disease, diabetes, COPD, and epilepsy. To our knowledge, this study is the first to estimate utilities in patients with chronic pain at the population level and will be useful to inform future cost-utility analyses.

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Using electronic medical records to better understand the relationship between testing, diagnosis and treatment of gonorrhea in Ontario

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Funding: IMS Brogan provided the access to information, time, and support needed to complete this analysis.

Background: Anonymized longitudinal EMR patient data (IMS Evidence 360, Canada) were examined to better understand the relationship between the testing, diagnosis, and treatment of gonorrhea. A 42% increase in the volume of Gonorrhea cases has been observed by Public Health Ontario (2012-14), with treatment resistant cases at just over 10%. This study leverages EMR data to validate these trends and provide additional insights related to patient treatment. Testing, diagnosis and treatment information by age, gender, and year were examined for cross-sectional cohorts from 2008 to 2014. A longitudinal cohort was also used to control for socio-demographic changes in the EMR patient panel. In recent years testing rates for women have been declining, while testing for men has been increasing. In spite of this, test rates for women are 2-5 times the level for men, even though men are twice as likely to be diagnosed with gonorrhea. The drop in testing for women appears to align with changes to cervical cancer screening guidelines (and funding for pap tests) in Ontario. Young women (<=28) represent the largest (67.6%

of women) and fastest growing segment for gonorrhea, while older men (>=29) represent the largest segment (59.2%) of men. Treatment using Cefixime and Azithromycin is the most common, even though this is no longer recommended as first line treatment for gonorrhea. This analysis generally aligns with information from Public Health Ontario, and provides insights beyond those currently available. It also demonstrates the value that EMR insights can bring to a challenging area such as STIs.

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Multidisciplinary pain management for fibromyalgia

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Background: Chronic non-cancer pain (CNCP) is very complex and no single discipline has the expertise to assess and manage it independently. Several Canadian practice guidelines endorse a multidisciplinary team approach as the optimal treatment for CNCP. As part of a large systematic literature review eligible articles were subdivided by pain etiology and results for fibromyalgia pain are reported here.
Methods: Comprehensive search strategy was developed for a systematic review of the published literature, identifying randomized controlled trials reporting on various outcomes associated with the efficacy of multidisciplinary care for the treatment of chronic pain.
Results: Six articles reporting multidisciplinary pain interventions (MPI) for fibromyalgia were included. A rheumatologist was the medical specialist involved in the MPI in 5 trials, a psychologist in 5 trials, a physiotherapist in 2 trials and occupational therapist in 2 trails. Total hours of the intervention varied from 18 – 48, took place over 2 – 16 week time periods. Pain, quality of life (QoL) and multiple emotional functioning outcomes were collected in all 6 trials. Usual care/wait list was the comparator in 4 trials, conventional drug therapy in one and medical therapy in the last. Only three trials reported what meds were being used: analgesics and anti-depressants (tricyclic/SSRIs) were always prescribed. Four trials reported significant improvements in pain scores, and 5 in QoL scores.
Conclusion: No meta-analysis could be conducted because of the substantial heterogeneity of the actual intervention and outcomes measures. This leaves uncertainty in the interpretation of the improvements in pain & QoL.

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Propensity score matching within economic evaluations based on non-randomized studies, is it really enough?

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Background: Treatment allocation within non-randomized studies may often be influenced by clinical opinion. It is unclear if propensity score (PS) methodology fully adjusts for all factors influencing clinical opinion since some of these may be unmeasured within the examined database. Impact of these unmeasured confounders on the conclusions of the economic evaluation of the non-randomized study could be substantial.
Methods: We used data from a published non-randomized study, which enrolled 195 patients (58.2%) to receive open surgical repair (OSR) and 140 patients (41.8%) to receive endovascular aneurysm repair (EVAR) for the treatment of abdominal aortic aneurysm. OSR patients were classified as being at low risk (LR) or high risk (HR) for post-surgical complications based on clinical opinion and scoring algorithms while all EVAR patients were classified as HR. One-to-one PS matching was used within the full population to select a more balanced patient sub-population. Incremental cost-effectiveness ratios (ICERs) were assessed within the HR sub-population and the PS-matched sub-population.
Results: EVAR was identified as the dominant treatment option within the HR sub-population. Unlike results obtained within the HR sub-population, the ICER of EVAR was estimated at $93,608 per life-year gained within the PS-matched sub-population. Although balance was improved within the PS-matched sub-population, unbalance remained on several patient characteristics which may partly explain the different results.
Conclusions: Results of this study highlight the fact that PS matching may not always fully adjust for

confounding and additional adjustment techniques may be required when conducting economic evaluations based on non-randomized studies.

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One-year outcomes among statin users in a population-based cohort of COPD patients

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Background: COPD is a progressive and irreversible disease characterized by inflammation in the airways. Evidence suggests that systemic inflammation may also be present in patients with COPD. Statins have been shown to reduce markers for systemic inflammation which have been linked to negative outcomes in COPD patients. The objective of this study is to examine the association between statin use and one-year survival in COPD patients.
Methods: Using population-based data for the province of British Columbia we identified a cohort of COPD patients based on their PharmaNet prescription profiles. We then identified those COPD patients that were incident statin users. A one-year exposure ascertainment window was used to classify statin users after their COPD index date. Mortality in the year following this period was the outcome of interest. Those with the event of interest within the exposure ascertainment window were removed. A Cox Proportional Hazards Model was estimated for the time to death.
Results: We identified 38 300 COPD patients. The median age of these patients was 70.9 (IQR: 61.6-79.0) and 52.6% were female. Among these, 7610 (19.9%) had received their initial statin prescription 1 year from their COPD index date. The hazard ratio suggests a protective effect for statin users versus non-users for all-cause mortality within 1 year (adjusted HR: 0.663 (95%: 0.607-0.724).
Conclusion: Statin use in COPD patients appears to reduce the risk of mortality.

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A literature review of the indirect costs associated with cardiovascular disease in Canada

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Background: Cardiovascular (CV) events are a leading cause of premature mortality and extended morbidity in Canada. While the direct costs of the burden of cardiovascular disease (CVD) are well-studied, the indirect costs due to lost productivity, caregiver burden, disability, and mortality are not as well understood. In order to characterize these costs, we conducted a literature review of the indirect costs of CVD in Canada.
Methods: A targeted literature review of the Ovid MEDLINE, Wiley's Cochrane Library, HEED, and Web of Science databases over the years 2000-2015 was conducted using MeSH terms and other keywords. Studies published in English, presenting indirect costs associated with CVD or CVD-related conditions in Canada were included. Costs were inflated to $2015 CDN dollars.
Results: Out of 122 records identified by the literature search, 104 citations were excluded based on abstract screening. Full-text review of the remaining 18 studies resulted in the exclusion of 11 studies, while 7 studies were included for analysis. These 7 studies provided indirect costs associated with stroke (n=3), myocardial infarction (n=2), heart failure (n=2), angina (n=2) and coronary artery disease (n=1). Most studies were prospective studies (n=5) and estimated indirect costs in terms of productivity losses using the human capital method. Indirect costs ranged from $3 (heart failure) to $22,270 (stroke) per patient.
Conclusions: There are very few studies that have evaluated the indirect cost of CVD in Canada. In addition, the magnitude of the cost estimates varied widely between studies based on the patient population, availability of data, and calculation method selected.

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