of improving refill rates. This leads to improved medication compliance and improved clinical outcomes. Because selected medications were also formulary-preferred agents, formulary compliance and volume within several key therapeutic categories was enhanced.

**PHP20**

SURVIVAL ANALYSIS IN SEDATED INTENSIVE CARE UNIT (ICU) PATIENTS

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**OBJECTIVES:** To compare survival in sedated ICU patients by hospital type and to investigate various factors associated with patient survival.

**METHODS:** Data from 622 patients admitted to the ICU, intubated more than 24 hours, and receiving sedatives/analgesics during intubation were collected from 42 hospitals from November 22, 1999 to March 4, 2000. Patient demographic, sedative and analgesic selection, and outcome data were recorded on standard data forms. The Kaplan-Meier (KM) survival curves and the Cox proportional hazard model were used to examine the effect of hospital type and other factors on patient survival.

**RESULTS:** Patients in teaching hospitals had a significantly higher survival rate compared to community hospitals (p < 0.02). The Cox regression analyses showed that patient mortality was significantly associated with older age (hazard ratio; HR = 1.03), higher severity of illness (HR = 1.04), having certain comorbid conditions (lymphoma (HR = 2.87) and chronic hypoxia (HR = 2.57)), receiving analgesic agents (e.g., morphine, hydrocortisone, and fentanyl) (HR = 2.76) and receiving care in a community hospital (HR = 0.62). However, whether the patient received treatment consistent with practice guidelines for ICU sedation and was treated in a hospital with a care plan for ICU sedation had no significant impact on patient survival in this analysis.

**CONCLUSIONS:** The results suggest that patients admitted to teaching hospitals seem to have better survival compared to community hospitals controlling for other factors that impact patient outcomes. However, whether this is due to hospital type, some other patient care practice or patient factors needs to be determined.

**HEALTH POLICY—Economic Outcomes**

**PHP22**

**PRESENTATIONS**

**PRESENTATIONS**

**PHP21**

THERAPEUTIC INTERCHANGEABILITY OF LEVOTHYROXINE

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**OBJECTIVE:** This evidence-based review evaluates the therapeutic interchangeability of levothyroxine between the original product Synthroid, and the two major generic brands Levoxyl and Levothroid, for use in hypothyroidism.

**METHODS:** A literature search identified 8 bioequivalence trials comparing different formulations of levothyroxine tablets. Meta-analyses were conducted to compare average bioavailability using three pharmacokinetic measures (Total T4, Thyrotropin-stimulating Hormon [TSH], and Free Thyroxine Index [FTI]). These measures were also evaluated for differences in variability between treatment groups.

**RESULTS:** The three formulations of Synthroid, Levoxyl, and Levothroid can be expected to produce similar average levels of circulating total T4 and TSH at steady state. Due to limited data, this statement does not extend to levels of free T4 nor free T3. Meta-analyses suggest that differences may exist in the variability of effect of levothyroxine products. Specifically, individual TSH levels in treated hypothyroid patients may span a wider range with some products than with others. This variability may be due to true individual differences in the variability of absorption of these products or to the use of outdated assay techniques (first generation radioimmunoassay) and short study durations that do not allow enough time for the patient to reach steady-state.

**CONCLUSION:** Studies generally suggest that Synthroid, Levoxyl, and Levothroid are bioequivalent on average. However, population (between subject) variability may be different across products. Establishment of individual bioequivalence will require new, prospective studies of adequate treatment duration that use the most sensitive assay methodologies. Until such studies are undertaken, current treatment guidelines that recommend hypothyroid patients be reassessed 6 weeks after a change in brand or dose should remain in effect.

**PRESENTATIONS**

**PHP22**

USING THE AMERICAN PRODUCTIVITY AUDIT (APA) TO INFORM EMPLOYERS ABOUT THE WORK-RELATED COST OF HEALTH CONDITIONS IN THEIR WORKFORCE

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**OBJECTIVES:** The American Productivity Audit (APA), an ongoing week-to-week telephone survey, provides valid and reliable estimates of health-related work loss. The APA is currently being used to generate tailored reports for employers to inform them of the lost productive work time associated with specific health conditions. The paper illustrates the process.

**METHODS:** We developed and validated the Work and Health Interview (WHI) for APA administration. The WHI quantifies missed work hours and lost productive time while at work for specific health conditions using
RESULTS: Conducted by using Treeage (DATA, v3.5). Data analysis was conducted by using Treeage (DATA, v3.5).

METHODS: A probability pathway model was developed for PDRM in older adults, based on a previously published methodology. To determine the probabilities that would be assigned to each branch of the pathway, a panel of 25 health care professionals (12 general practitioners, 4 clinical pharmacologists, 6 geriatricians, and 3 pharmacists) completed a written survey. Data from the Population Health Research Unit (PHRU) at Dalhousie University were primarily used to determine the costs that were assigned to each outcome. Data analysis was conducted by using Treeage (DATA, v3.5).

RESULTS: The cost-of-illness model estimated that the annual cost of PDRM in older adults in Canada is $10.9 billion CAN. Admissions to long-term care were found to be the biggest driver in the model, accounting for $6.7 billion CAN of the costs. One-way sensitivity analyses were performed, varying the probability and cost estimates, but the estimated total cost was relatively insensitive to these changes.

CONCLUSIONS: The burden of PDRM is potentially substantial in both the adverse clinical outcomes to the patient and the economic impact to our health care system. At an estimated annual cost of $10.9 billion, PDRM in older adults is one of the more costly “illnesses” in Canada, with a greater annual cost than either cancer or respiratory diseases. This study represents a progression in the literature on cost-of-illness models by focusing exclusively on (1) preventable drug-related morbidities that (2) occur in older adults, in (3) Canada.

PHARMACY BENEFIT RESOURCE UTILIZATION BY ENROLLEES OF A PUBLIC EMPLOYEES INDEMNITY INSURANCE PROGRAM FOR FIVE FISCAL YEARS FROM 1996 TO 2001
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OBJECTIVES: Quantify the prevalence and magnitude of utilization of pharmacy benefits in a public employees indemnity insurance program.

METHODS: The study was a retrospective study of paid pharmacy claims for an insured population of approximately 150,000 eligible members per month for five fiscal years from July 1996 to June 2001. Eligibility and paid pharmacy claims files were analyzed to determine the proportion of members who were recipients, intensity (number of prescriptions) per recipient per year, pharmacy reimbursement per prescription, and pharmacy reimbursement cost per member per month. The data were divided into twenty age groups and a sub-analysis was performed to assess changes in proportion, intensity, and pharmacy reimbursement for each age group over a five-year period.

RESULTS: Over the five-year period, the proportion of recipients to eligible increased 9.4% from 0.717 to 0.784; intensity per recipient increased 13.9% from 16.5 to 18.8 prescriptions per recipient per year; pharmacy reimbursement per prescription increased 51.2% from $40.17 to $60.74 per member per month. This led to an overall increased cost per member per month over the five-year period of 83.2% ($42.20 to $77.31). Intensity per recipient and proportion of recipients increased greatly with age. Recipients aged 10–14 received 5.8 prescriptions per year while those aged 30–34 received 9.4, those aged 50–54 received 18.9, and those aged 70–74 received 30.1 prescriptions per year in fiscal year 2001. The proportion of recipients to eligible increased from 0.593 to 0.784, respectively, for the age groups per the fiscal year.