

superiority in terms of safety and efficacy among drugs. This bulletin intends to improve health care efficiency when it points out the differences on treatment costs among the drugs. The objective of this study is to analyze all editions of The Health and Economics Bulletin available on ANVISA website. **METHODS:** Data were collected from editions of Health and Economics Bulletin published since August 2009 (month of launch) until January 2012. The variables considered were: number and type of diseases, therapeutic classes, active substance, drugs and treatment costs. **RESULTS:** Seven editions of the bulletin were published and each number addressed a different disease such as osteoporosis, glaucoma, gastroesophageal reflux, arterial hypertension, epilepsy, dyslipidemia and erectile dysfunction. In total, 11 therapeutic classes were evaluated which comprises biphosphonates and statins on osteoporoses and dyslipidemia editions, respectively. A total of 27 active substances and 51 drugs were assessed, including generics, similars and brand drugs. Fifty-one costs of treatment were performed which demonstrated considerable differences between drugs prescribed for the same disease. For example, on the arterial hypertension edition, it was found 1811% of difference on treatment costs between the most expensive and the lowest cost drugs although they have similar safety and efficacy levels, based on scientific evidences. **CONCLUSIONS:** The Health and Economics Bulletin is an important information tool and was elaborated to improve the critical view of health care decision-makers and patients. Considering differences of treatment costs among drugs that have the same safety and efficacy, they can select the drugs more efficiently.

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REVIEW OF THE CLINICAL AND ECONOMIC VALUE IN THE USE OF HYBRID OPERATING ROOM

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OBJECTIVES: Fewer than 100 US hospitals have all-inclusive hybrid operating room (HOR) suites (ECRI, 2010), although this is increasing at a current annual growth rate (CAGR) of 15% (Hankel, 2011). The benefits inherent in utilization of the hybrid approach are substantial, yet remain largely theoretical, given the limited prevalence of HORs. Recent HOR technological innovations, including significant improvements in image quality, greater detector flexibility and angulation, and better mobile and floor-mounting options, have driven demand for clinical and economic data to support the initial investment required. In this study, we reviewed existing literature on the clinical and economic value offered by HOR suites. **METHODS:** A systematic review of peer reviewed literature published between 2006 and 2011 was conducted. Descriptions of the clinical, economic, and workflow benefits of HOR programs were incorporated into the review. The review was augmented by a search of gray literature, clinical trials and industry market research databases, as well as relevant congress proceeding documents. Articles were screened for relevance and included if they incorporated elements of HOR outcomes, cost drivers, cost-effectiveness, or adoption drivers. **RESULTS:** The literature documents tangible advantages of an HOR approach from clinical, treatment facility and payer perspectives. For example, the data suggest that enabling interventional radiologists and surgical specialists to collaborate in real time may decrease required OR treatment times by almost 30%. Other HOR primary cost drivers are associated with room installation, resource use efficiency, and infection control. Direct comparative data, however, is lacking in key areas. **CONCLUSIONS:** Our data suggests that there are clear workflow, clinical, and economic benefits to adopting hybrid operating rooms and procedures. Health care decision makers will benefit from detailed reviews of HOR clinical and economic value to determine appropriate reimbursement schemes as well as to inform investment decisions. More research is needed to establish the appropriate approach to compare HOR versus segregated approaches.

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ROOT CAUSE ANALYSIS OF DISCARDED DRUGS IN TAIWAN

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OBJECTIVES: According to 2010 Bureau of National Health Insurance, Department of Health in Taiwan, drugs costs accounted for a large proportion in health care expenditures. On the other hand, many drugs are discarded every day from the Shuang Ho Hospital drug's recycling bins. Some of them are high-priced, unopened and unused such as Spiriva[®], Plavix[®], etc. It shows that among all of the health insurance reimbursements for medications, 25% discarded. This study is to analyze the main reasons for people discarded drugs. **METHODS:** In order to understand the possible reasons of discarding drugs, we using questionnaires for people who may discard or has discarded drugs. At the same time, also recording the drug's name and its quantity in the Shuang Ho Hospital drug's recycling bins. The 122 questionnaires were distributed, of which 112 copied were valid, 10 copied were invalid. We used SPSS statistical software to analyze the questionnaire results. We recorded the quantity of discarded drugs in drug's recycling bins from Sept.26.2011 to Oct.21.2011, classified these discarded drugs into several classes. **RESULTS:** According the questionnaire results, the most likely cause for people to discard drugs can be divided into three main reasons: misconceptions (including fear of drug's side effects, self-withdrawal and worry about health foods may contain bad ingredients), forget the medication and drug deterioration (including not pay attention to the expiration date and improper preservation). The average weight of drugs from recycling bin is 3.76 kg/day, of which gastrointestinal drugs, cardiovascular drugs, analgesics and hypoglycemic drugs (9.49%) are the top four classes. **CONCLUSIONS:** When we figure out the main reason for people discarded drugs, we can do something to reduce the discarded drug's quantity more effec-

tively, and finally, drugs will not being wasted, health care insurance in Taiwan is expected to save about NT \$ 30 billion per year

PHP53

RECENT GROWTH IN EMPLOYER HEALTH CARE SPENDING BY DISEASE: AN UPDATE

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OBJECTIVES: We previously highlighted the importance of disease-specific data in understanding growth in healthcare spending. This update presents more recent data and decomposes the drivers of spending growth into price, utilization, and disease prevalence changes. **METHODS:** US employer health care spending was estimated using claims data from employer sponsored health plans from 2004 and 2009 (to be updated to 2010 for presentation). Claims were assigned to disease-specific episodes using the Thomson Reuters Medical Episode Grouper (MEG). Data were projected using sampling weights derived from the Medical Expenditure Panel Survey and 5-year growth in spending was decomposed into growth in disease prevalence, resource consumption per disease, and medical care price level. **RESULTS:** Annual spending data were analyzed for 107 employers with 11.5 million health plan members in 2004 and 143 employers with 18.0 million members in 2009. Over these 5 years spending per member per year grew 34% overall, 11% after inflation adjustment. The top 50 disease categories (out of 560) accounted for 52% of spending in 2009. Prevalence of disease-specific treatment grew for 42 of 50 categories, led by obesity (93%), renal failure (91%), and complications of medical and surgical care (43%). Overall, growth in prevalence drove more than 90% of the inflation-adjusted spending increase. Resource use per patient grew in 27 of the top 50 diseases, led by dyslipidemia (106%), multiple sclerosis (57%), and osteoarthritis except spine (42%). However, other diseases showed declines and overall intensity of resource use grew only 2% over 5 years. **CONCLUSIONS:** Apart from medical care price inflation, the major driver of growth in employer health care spending is increased prevalence of treated disease, led by obesity and its consequences. A secondary factor is increased intensity of resource use in those diseases targeted by innovation in biologic therapies and surgical devices.

PHP54

HEALTH CARE EFFICIENCY FROM ELECTRONIC HEALTH RECORDS IMPLEMENTATION: A PRELIMINARY REVIEW OF THE LITERATURE

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OBJECTIVES: The American Recovery and Reinvestment Act of 2009 includes an estimated \$27 billion over 10 years to support adoption of electronic health records (EHRs). This includes the Health Information Technology (HIT) for Economic and Clinical Health Act of 2009, which promotes meaningful use of HIT through Medicare and Medicaid EHR Incentive Programs. In November 2011, the United States (US) Department of Health and Human Services released a report showing adoption of HIT doubled in two years. The objective of this review was to examine the impact of EHR and computerized physician order entry (CPOE) on health care efficiency. **METHODS:** A review of published original research in the United States was conducted in PubMed for years 2007 through 2011. The number of studies reporting efficiencies and inefficiencies, setting of care, and areas of efficiency and inefficiency were examined. **RESULTS:** A total of 18 studies were reviewed: 13 EHR or EHR/CPOE and 5 CPOE only. Settings of care included the hospital inpatient (n=6), outpatient clinic/practice (n=6), emergency department (n=3), surgical center (n=2), and assisted-living facility (n=1). All but one study reported efficiencies in at least one area. Efficiencies from EHR or EHR/CPOE were reported in decreased physician/staff time (n=6), increased patient volume (n=3), decreased length of stay (n=3), increased provider productivity (n=2), decreased tests/procedures ordered (n=1), and decreased time to diagnosis (n=1). Efficiencies from CPOE were observed in decreased order processing/verification time (n=3), decreased physician/staff time (n=1), and decreased time to medication administration (n=1). Inefficiencies from one CPOE study were reported in increased prescribing time. Three of the EHR or EHR/CPOE studies also reported inefficiencies. Some factors that contributed to inefficiencies included complex/acute cases and the level of EHR implementation. **CONCLUSIONS:** EHR implementation has the potential to improve efficiencies in various practice settings. Further investigation is warranted to examine factors contributing to inefficiencies.

PHP55

EVIDENCE BASED ADVERTISEMENT: WHERE IS THE PHARMACOECONOMIC AND HUMANISTIC OUTCOMES RESEARCH EVIDENCE?

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OBJECTIVES: The product promotional advertisements of pharmaceutical companies in scientific journals have the advantage of reaching to highly focused group of doctors. The specificity of these advertisements also demands for use references to support advertising claims which creates a niche speciality, evidence based advertising. The objective of the study is to assess the references pertaining to scientific advertisements with regard to pharmacoeconomics and humanistic outcomes evidence usage. **METHODS:** A cross sectional study was designed to assess the use of pharmacoeconomics and humanistic evidences use in product promotional advertisements in scientific journals. For the purpose of study 14 journals, published between January, 2010 and December, 2010 which contain advertisements were screened. These journals were searched for advertisements and quoted references. All the quoted references from these advertisements were collected and examined. The classification of references is done based on source as journal articles, books,

websites, data on file and miscellaneous. The Journal articles were browsed in PubMed and Google. All collected full length articles and abstracts were examined for key words Pharmacoeconomic, Cost effectiveness, Cost utility, Cost minimization, Cost benefit and quality of life by two independent reviewers. Descriptive statistics was used for reporting the results. **RESULTS:** All 14 journals searched contained 1435 advertisements of 237 brands. The total references quoted in these advertisements were found to be 242. Of these 242 references 57.43% were from articles published in journals, 25.2% from miscellaneous sources and 11.15% from data on file. Only 4 (0.2%) references among the published research articles were having pharmacoeconomics and humanistic outcomes research evidence. **CONCLUSIONS:** The present study clearly indicates the negligible number of pharmacoeconomics and humanistic outcomes research evidence used in advertisements published in scientific journals and there is a further need to extend this study for other mode of advertisements such as detailing aids, leave behind literature and official websites of pharmaceutical companies.

PHP56

AN ANALYSIS OF INTERNAL MEDICATION ERRORS USING INCIDENT REPORTS AT A TEACHING HOSPITAL IN JAPAN: A RETROSPECTIVE STUDY

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OBJECTIVES: Few studies regarding clinical epidemiology of internal medication errors are published in Japan. This study aims to explore the frequency and type of internal medication errors using incident reporting. **METHODS:** A total of 1706 incident reports related with internal medication errors were collected and examined at a teaching hospital with 1354 beds in Japan. Frequency, type, and injury level of internal medication error, and health care professionals involved are investigated in the internal medication use process (e.g., ordering, dispensing, transcription, and administration). **RESULTS:** We detected a total 1706 intravenous medication errors between January, 2006 and March, 2010. In each stage the frequency of intravenous medication errors were ordering: 2 (0.1%), transcription: 2 (0.1%), dispensing: 604 (35.4%), and administration 1,061 (62.3%). And, numbers of reports by injury level were 732 (42.9%) reports with level 1, 328 (77.8%) reports with level 2, 26 (1.5%) reports with level 3a, 3 (0.2%) reports with level 3b, and one (0.06%) report with level 5. The most common type of health care professionals were nursing staff (1,072: 62.8%), pharmacist (590: 34.6%), care worker (24: 1.4%) and physician (13: 0.9%), in decreasing order. Pharmacists were much more involved in internal medication errors than in intravenous medication errors in our study. **CONCLUSIONS:** Different hospitals in Japan might lead to these results, and we believe deeper analyses can be conducted along this theme. Furthermore, it would be very important not only for junior residents and new nursing staff, but for newly-hired pharmacists to be taught with emphasis that the drugs indicated above through residency and education programs have a higher tendency to be involved with internal medication errors. The internal medication errors involved will be discussed with specificity during our presentation.

PHP57

AN ANALYSIS OF INTRAVENOUS MEDICATION ERRORS USING INCIDENT REPORTS AT A TEACHING HOSPITAL IN JAPAN

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OBJECTIVES: Few studies regarding clinical epidemiology of medication errors are published in Japan. This study aims to explore the frequency and type of intravenous medication errors, and drugs involved using incident reporting. **METHODS:** 1,855 incident reports were collected and examined at a teaching hospital with 1,354 beds in Japan. Frequency, type of medication error, and type of drugs are investigated in the medication use process, prescription/ordering, dispensing, transcription, and administration. **RESULTS:** We detected a total 1,885 intravenous medication errors between January, 2006 and March, 2010. In each stage the frequency of intravenous medication errors were ordering/prescription: 28 (1.5%), transcription: 3 (0.2%), dispensing: 155 (8.2%), and administration 1,699 (90.1%). The most common type of error throughout the medication use process were omission of drug, wrong drug, wrong dose and wrong time. And, the most common type of drugs were central nervous system drugs, anti-diabetic drugs (insulin), and anti-coagulant (heparin), in decreasing order. Furthermore, the most common health care professional involved was nursing staff (1,593: 84.5%) and the next was pharmacist (168: 8.9%). **CONCLUSIONS:** Different areas in Japan might lead to these results, and we believe deeper analyses can be conducted along this theme. Nursing staff is the number one health care professionals involved in the medication errors, given that he/she administers most medications and is the final individual in the medication use process. Therefore, it would be very important for newly-hired nursing staff to be taught with emphasis that the drugs indicated above through education programs have a higher tendency to be involved with errors. The intravenous medication errors involved will be discussed with specificity during our presentation.

PHP58

EFFECTIVENESS OF AUTOMATED TELEPHONIC REMINDERS ON MEDICATION ADHERENCE

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BACKGROUND: Improving patient adherence to medication regimens is an important public health and clinical goal. Numerous studies have shown that non-adherence to medication is associated with increased hospitalization, progression of disease, and higher mortality. There are many practical and behavioral factors that

influence non-adherence; one of the top reasons cited is patient forgetfulness. Automated telephonic reminders are among the most common technologies used to help improve patient medication adherence. **OBJECTIVES:** To evaluate the effectiveness of an automated telephonic reminder system at improving patient adherence to medications used to treat chronic conditions. **METHODS:** We conducted a test-control cohort analysis using administrative data from a large chain pharmacy. The cohorts included patients with maintenance prescriptions that were scheduled to be refilled in April 2010. The intervention group had 82,150 patients from Colorado; these patients received refill reminder calls, as needed, over 12 months. The control group included 182,326 patients from Washington State; these patients did not receive reminder calls. Other than location, both groups had similar demographic characteristics. Medication adherence and persistence were calculated and compared between the intervention and control groups in a 12-month follow-up. Medication adherence was evaluated using both continuous and categorical Medication Possession Ratio (MPR) measures. Clinical adherence was defined as MPR \geq 80%. Medication persistence was measured as days on therapy and percent of patients remaining on therapy. **RESULTS:** At 12-month follow-up, the MPR for the intervention group was 2.4% higher than the control group ($p<0.001$), and the intervention group had a 2.3% higher proportion of clinically adherent patients ($p<0.001$). Persistence for the intervention group was 7.8 days higher than the control group ($p<0.001$), and 51.3% of patients in the intervention group stayed on therapy compared to 49.6% in the control group ($p<0.001$). **CONCLUSIONS:** Automated telephonic reminders significantly improved patient adherence to medications used to treat chronic conditions.

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THE ROLE OF PHARMACIST FOR PATIENT SAFETY: A NATIONWIDE SURVEY ON PATIENT SAFETY MANAGEMENT SYSTEM

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OBJECTIVES: This study aims to explore the role of pharmacist for patient safety activity in Japan. **METHODS:** We surveyed nationwide the situation of patient safety activities in hospitals allowed for additional costs on patient safety measures under the social insurance medical fee schedule using a questionnaire. We send the questionnaire including 14 fields and 93 items, to targeted 2,674 hospitals (all hospitals: 8,706 as of 1st June in 2010) in Japan. 669 hospitals responded (response rate: 25.0%). **RESULTS:** In the assignment of risk manager, mean number of full-time risk manager as a physician was 0.04 \pm 0.24. Likewise, mean number of full-time risk manager as a nurse and a pharmacist were 0.88 \pm 0.96 and 0.07 \pm 0.25. And, mean number of incident reports filed by physicians, nurses, and pharmacists were 17.7 \pm 44.6, 510.0 \pm 753.7, and 30.8 \pm 112.5 in FY 2007, 17.7 \pm 45.4, 579.9 \pm 782.5, and 31.4 \pm 86.6 in FY 2008, and 20.5 \pm 57.0, 651.7 \pm 946.4, and 39.3 \pm 171.2 in FY 2009. Mean number of full-time risk manager as a pharmacist was higher than that as a physician, and mean number of incident reports from pharmacists was larger than that from physicians in Japan. **CONCLUSIONS:** The role of pharmacists is getting increasingly larger for securing patient safety and pharmacists at hospitals are required to be much more involved in patient safety activity, as medication errors highly accounts for adverse events and Japan is suffering from a serious shortage of physicians. Instead, this study is required to be statistically investigated with adjusting number of beds.

PHP60

OUTCOMES OF INTEGRATED MEDICAL CARE SERVICE PROVIDED IN OUTPATIENT UNITS IN A MEDICAL CENTER: TWO-YEAR EXPERIENCE

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OBJECTIVES: The majority of patients with multiple chronic diseases tended to visit single hospital persistently, which accounted for 3.5% of all beneficiaries and 19.3% of covered national health insurance expenses in Taiwan. The aim of this research was to describe the implementation of Integrated Medical Care (IMC) services for loyal outpatients in China Medical University Hospital (CMUH) and its two-year outcomes. **METHODS:** We used the pre-post study design. Those 15,311 patients who were loyal health care users and with multiple chronic illnesses were involved. Upon patients' disease characteristics and preference, they were offered pluralistic IMC services, including through integrated, geriatric and/or pharmaceutical care clinics, in addition to via usual primary and specialty clinics, in the outpatient units during December 2009 to December 2011. While the integrations of outpatient care were facilitated by the collaboration of administration focus group and clinical care team, those severe and vulnerable patients' medication related problems, health care utilizations in CMUH were reviewed periodically by clinical care team and continuously monitored by the clinical pharmacist. The differences of medical expenditure, number of OPD visits, number of prescribed medication (Rx) and emergency department (ED) visits in CMUH during the same period but one-year prior (baseline) and the implementation periods were examined. **RESULTS:** After two consecutive years of IMC interventions, the medical expenditures and number of OPD visits per person per month were reduced profoundly (up to 7.67%), while comparing to the baseline. The numbers of Rx and ED visits, however, were not greatly different. **CONCLUSIONS:** There were positive outcomes of offering pluralistic IMC services toward loyal, chronically ill patients on medical expenditures and outpatient visits. The outcomes would be more significant across time if the IMC services were provided proactively toward more mild to moderate ill patients.