ICD-9 codes were used to identify patients' comorbidities and advanced liver disease complications. **RESULTS:** The 5-year prevalence rate (2007-2011) of chronic HCV among commercially-insured individuals was 0.187% (95%CI 0.185%-0.188%). In 2011, a total of 27,843 chronic HCV patients were identified. The average age of these chronic HCV patients was 53 years (SD 11). Chronic HCV patients exhibited a wide array of health problems. The prevalence rates of comorbidities such as anxiety (13.5% versus 4.7%), depression (17.9% versus 5.2%), alcohol abuse (35.3% versus 1.2%), hypertension (46.2% versus 18.6%), type 2 diabetes (18.8% versus 6.2%), HIV (2.5% versus 0.1%), and ESRD (2.1% versus 0.1%) were higher (all statistically significant, p<0.0001) in the chronic HCV population than the non-HCV population. Similarly, the 2011 prevalence rates of advanced liver disease were higher in the chronic HCV population (all p<0.0001), including non-decompensated liver disease (20.5% versus 0.1%), decompensated cirrhosis (15.1% versus 0.5%), hepatocellular carcinoma (3.4% versus 0.03%), and liver transplant (2.6% versus 0.01%). **CONCLUSIONS:** Chronic HCV patients have a wide array of significant health problems and stages of advanced liver disease relative to non-HCV patients.

PIN22

SEASONAL TRENDS IN INCIDENCE OF HERPES LABIALIS ("COLD SORES") OUTBREAKS: AN INFODEMIOLOGICAL ANALYSIS USING INTERNET SEARCH ENGINE QUERY DATA

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OBJECTIVES: The Internet is an important source of health information and *Google* search engine queries are an increasingly useful source of health data. The study objective was to analyze *Google* search query data about herpes labialis ("cold sores") to determine if information-seeking behavior on the topic substantiates anecdotal evidence that herpes labialis outbreaks have cyclical, seasonal trends. **METHODS:** *Google Trends* provides normalized, scaled indices of the volume of *Google* search engine queries by geographic location and time. Using the search terms "cold sore" and "cold sores," weekly search volume indices data for 2004-2012 were downloaded and aggregated into weighted mean monthly values in three datasets: (2) Worldwide; (2) USA; and (3) Australia. Descriptive statistical analyses and rankings were performed to identify/quantify cyclical trends (peaks/troughs) in search volume activity. **RESULTS:** Plots of search volume for herpes labialis information over time reveal striking intra-annual cyclic patterns—moving from high search volume in fall/winter months to low volume in spring/summer months. December was the most frequent (67%) high volume search month in the Worldwide and USA analyses; most frequently June (67%) and May/June (equally 33%) ranked lowest. In Australia (with reversed, southern hemisphere seasons), search volume most frequently (50%) peaked in June; February was lowest (63%). Quartile analysis (i.e., "top 3 months" in search volume frequency) showed November/December/January peaking in the Worldwide and USA analyses, while June/July/August predominated in Australia. Conversely, May/June/July and June/July/August ranked lowest in the Worldwide and USA analyses, respectively; February/March/May ranked lowest in Australia. **CONCLUSIONS:** Analyzing Internet search data provides valuable insights into health-related behavior and disease epidemiology. Results of this study show that Internet research activity about herpes labialis has intra-annual cycles, presumably motivated by actual outbreaks of herpes labialis and treatment needs. Results loosely correlate with seasons, suggesting connections between herpes labialis outbreaks and changes in meteorological/climatological conditions.

PIN23

USE OF AN ELECTRONIC HEALTH RECORD (EHR) DATABASE TO STUDY DRUG RESISTANCE AMONG HOSPITALIZED PATIENTS WITH COMPLICATED INTRA-ABDOMINAL INFECTION (CIAI)

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OBJECTIVES: Develop a methodology to characterize drug resistance among inpatients treated for complicated intra-abdominal infection (cIAI) using a hospital-based electronic health record (EHR) database. **METHODS:** This retrospective observational study used qualifying inpatient encounters between April 1, 2005 and March 31, 2011 in Cerner *Health Facts*, a de-identified database derived from contributing facility EHRs. cIAI encounters required a primary or secondary discharge diagnosis of intra-abdominal infection, a qualifying surgical procedure and qualifying culture (defined by source/site description and interpretable resistance testing) ≤2-3 days from admission. The resistant group needed ≥1 positive culture interpreted as resistant to at least one empiric antibiotic class (by Multum) based on 2009 Infectious Disease Society of America guidelines. A multilevel or hierarchical mixed-effects model assessed risk factors associated with resistance across at least two antibiotic classes. **RESULTS:** A total of 953 patients from 62 hospitals met cIAI criteria; 339 (35.6%) in the resistant and 614 (64.4%) in the sensitive group. Mean age was 57 years; 52% were male. Health care-associated infection (HAI) risk factors were more common among the resistant group (31.6% vs. 16.6%, *P*<0.001). Among the 339 patients in the resistant group, 48% (17% of the study population) had resistance to ≥2 guideline antibiotic classes. Antibiotic classes with the most resistance were first-generation cephalosporins, quinolones and third-generation cephalosporins. Total charges, length of stay and in-hospital mortality were all higher in the resistant group, but did not reach statistical significance. Risk factors associated with resistance across at least two guideline empiric antibiotic classes included HAI status, infection at the level of the appendix, blood dyscrasias and atypical or metastatic neoplasms. **CONCLUSIONS:** Resistance to antibiotics

recommended for empiric treatment of cIAI was common, and among those with resistance, nearly half had resistance across ≥2 antibiotic classes. Risk factors associated with multi-class resistance included HAI subgroup, appendicitis, blood dyscrasias and atypical/advanced cancers.

PIN24

THE IMPACT OF RENAL IMPAIRMENT, INFLAMMATORY BOWEL DISEASE AND ADVANCED AGE ON MORTALITY AMONG HOSPITALIZED PATIENTS WITH CLOSTRIDIUM DIFFICILE-ASSOCIATED DIARRHEA

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OBJECTIVES: *Clostridium difficile*-associated diarrhea (CDAD) increases the risk of hospital mortality. Factors associated with CDAD recurrence include renal impairment (RI), inflammatory bowel disease (IBD) and advanced age (≥65 y). These factors may also affect mortality risk; how CDAD modifies their effect on mortality is unknown. This cohort study analyzed these effects among hospitalized patients with hospital-origin CDAD (HO-CDAD) and community-origin CDAD (CO-CDAD) vs. non-CDAD controls. **METHODS:** A retrospective analysis (4/2005-6/2011) of the *Health Facts* database (Cerner Corp., Kansas City, MO) identified hospitalized adult patients with a positive *C. difficile* toxin collected ≥48 hours (HO-CDAD) or <48 hours (CO-CDAD) after admission. Generalized estimating equation models measured the effects of HO- and CO-CDAD, risk factors (RI, IBD, age ≥65), and their interactions on hospital mortality. **RESULTS:** 4,505 patients with HO-CDAD, 2,825 with CO-CDAD, and 276,486 controls were identified. Unadjusted hospital mortality was 13.0% in HO-CDAD, 10.7% in CO-CDAD and 2.7% in controls. There was no interaction with Age≥65 and CDAD: the odds were approximately doubled regardless of CDAD status. However, the effect of RI on mortality in HO-CDAD was 1.35 times higher than in controls (interaction odds ratio [OR] =1.35; 95% CI, 1.01-1.79). Considering the interaction term, the overall OR of dying with RI and HO-CDAD was 1.48 (95% CI, 1.12-2.00). Among controls, IBD had no significant effect on mortality (OR = 0.77; 95% CI, 0.52-1.14). The interaction term for CO-CDAD and IBD was 3.05 (95% CI, 1.20-7.79), for an overall OR for IBD with CO-CDAD = 2.36 (95% CI, 1.08-5.14). **CONCLUSIONS:** The effect of RI and IBD on mortality varies by CDAD status. RI and IBD have a synergistic (multiplicative instead of additive) effect with CDAD on mortality; if patients develop CDAD, their risk of dying greatly increases versus controls.

PIN25

CONTINUED DECLINES IN MORTALITY ARE LARGELY DUE TO REDUCTIONS IN NON-AIDS RELATED DEATHS, AND MORTALITY REMAINS DISPROPORTIONATELY HIGHER AMONG BLACKS AND THE PUBLICLY INSURED IN THE HIV OUTPATIENT STUDY (HOPS), 1996–2009

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OBJECTIVES: In the HAART era, timely identification and treatment of non-AIDS morbidities can enhance survival. Awareness of disparities in rates and causes of death can inform public health strategies. **METHODS:** Patients studied had ≥2 visits to any of 10 HIV clinics during 1996-2009. Death rates and causes were stratified by age, race, sex, health care payer and calendar period; trends were compared using Poisson regression. **RESULTS:** Among 8519 patients there were 993 deaths, 430 from AIDS, 469 from non-AIDS and 94 with unknown causes. Overall death rates per 100 person-years of follow-up declined during 1996-2000, 2001-2004, and 2005-2009 from 3.85 to 2.12 to 1.33, respectively (p<0.01 for trend) as did AIDS death rates (1.96, 0.91, 0.33; p<0.01 for trend) and non-AIDS death rates (1.55, 1.09, 0.78; p<0.01 for trend). Approximately one-third (31%) of mortality declines during 2005-2009 were from non-AIDS death reductions and 65% from AIDS death reductions; non-AIDS death rates remained higher than AIDS deaths among patients <45 (0.5 vs. 0.3, p<0.01) but not for patients ≥45 years. Overall 2005-2009 death rates were higher among blacks than non-blacks (2.03 vs. 1.01, p<0.01) and among persons with public health care payers (PUB) than non-public payers ([nPUB], 2.66 vs. 0.60, p<0.01). During 2005-2009, non-AIDS deaths accounted for 64.7% of deaths among blacks and 61.1% among PUB. More than 88% of patients received HAART during 2005-2009 in all subgroups; rates differed by race (85.6% among blacks, 90.0% among non-blacks, p<0.01) but not by payer (88.2% among PUB, 88.8% among nPUB; p = 0.57). **CONCLUSIONS:** In the HOPS, continued mortality declines resulted from decreases in non-AIDS and AIDS-related deaths. Excess mortality persisted among blacks and the publicly insured, with the majority of deaths from non-AIDS causes, suggesting that improved detection and management of chronic non-AIDS diseases are needed to achieve further mortality reductions.

INFECTION – Cost Studies

PIN26

BUDGET IMPACT ANALYSIS OF LIPOSOMAL AMPHOTERICIN B AND AMPHOTERICIN B LIPID COMPLEX FOR TREATING INVASIVE FUNGAL INFECTIONS IN HOSPITALIZED PATIENTS

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OBJECTIVES: To estimate the budget impact of changing the market shares of liposomal amphotericin B (L-AmB) and amphotericin B lipid complex (ABLC) for the treatment of invasive fungal infections (IFIs) in a US hospital. **METHODS:** An Excel-based budget impact model was developed to estimate the costs associated with using L-AmB and ABLC for treating adult patients with