



NEHI Compendium

Misuse

Evidence Table—Misuse

Study

Outcome

Inappropriate Prescribing For Elderly Americans In A Large Out-Patient Population
Curtis, L.H., Ostbye, T., Sendersky, V., Hutchison, S., Dans, P. E., Wright, A., Woosley, R.L., Schulman, K. A. ; 2004; Arch Intern Med

This study retrospectively reviewed claims data from a large national Pharmacy Benefit Manager (PBM) to determine the proportion of elderly patients who are prescribed one or more drugs that “should be avoided at any dose or frequency” in such patients according to revised Beer’s criteria.

There is misuse of some categories of drugs in the elderly. 21% of patients received one prescription drug of concern. 42.5% of these patients received a drug with the potential for severe adverse effects. 15% of patients received 2 prescriptions for drugs of concern. 4% of patients received 3 prescriptions for drugs of concern. Most of the 18 drugs studied were psychotropic drugs or neuromuscular agents.

Coprescribing And Codispensing Of Cisapride And Contraindicated Drugs [Brief Report]
Jones, J.K., Fife, D., Curkendall, S., Goehring, E. Jr., Guo, J.J., Shannon, M.; 2001; JAMA

This study retrospectively reviewed an MCO pharmacy claims database to determine the frequency of contraindicated coprescribing and codispensings, in which cisapride and a contraindicated drug were prescribed or dispensed to the same patient for overlapping periods, and the proportion of contraindicated coprescribing by the same physicians and codispensing by the same pharmacies.

270 serious cardiac arrhythmias, including 70 deaths, would likely have been prevented if mutually contraindicated medications had not been misused by prescribing them together. Of 131,485 cisapride prescriptions dispensed after the warnings began, 4,414 (3.4%) overlapped with at least one drug contraindicated in the labeling. Of all overlapping prescription pairs, 2,190 (50%) were by the same physicians, 3,908 (89%) were by the same pharmacies, and 765 (17%) were dispensed on the same day.

Misuse

Study

Outcome

Potentially Inappropriate Medication Use In The Community-Dwelling Elderly: Findings From The 1996 Medical Expenditure Panel Survey

Zhan, C., Sangl, J., Bierman, A.S., Miller, M.R., Friedman, B., Wickizer, S.W., Meyer, G.S.; 2001; JAMA

This study utilized an expert panel to review 1996 Medical Expenditure Panel Survey (MEPS) data to determine the prevalence of potential medication misuse in patients > age 65, and to examine risk factors for misuse.

In 1996, 21.3% of elders received at least one of 33 potentially inappropriate meds, including 2.6% who received one of the 11 “never use” and 9.1% who received one of the 8 “rarely appropriate” medications. Use of some inappropriate medications declined between 1987 and 1996. Persons with poor health and more prescriptions had a significantly higher risk of inappropriate medication use.

Costs Of Medical Injuries In Utah And Colorado

Thomas, E.J., Studdert, D.M., Newhouse, J.P., Zbar, B.I., Howard, K., M., Williams, E.J., Brennan, T.A.; 1999; Inquiry

This study consisted of a retrospective review of a random sample of records drawn from 28 hospitals in Colorado and Utah to estimate the frequency and costs of adverse events (AEs) in Colorado and Utah.

Half of AEs are avoidable, 46% occur in outpatient setting, and costs are identified.

Pain Medication Beliefs And Medication Misuse In Chronic Pain

Schieffer, B.M., Pham, Q., Labus, J., Baria, A. van Vort, W., Davis, P., Davis, F., Naliboff, B.D.; 2005; J Pain

This study surveyed 288 consecutive patients referred to a Veterans Administration Medical Center (VAMC) multidisciplinary pain clinic to assess the influence of medication beliefs, symptom severity, disability, mood, and psychiatric history on opiate medication misuse in chronic pain patients.

Misusers believed more strongly in the potential for opiate addiction and that they required higher doses than others. They also had a greater belief in opiate effectiveness and the importance of free access. Patients with a history of substance abuse report stronger beliefs in opiate effectiveness and show awareness of their addiction potential.

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Study

Outcome

Association Between Early Returns And Frequency Of ED Visits At A Rural Academic Medical Center

Riggs, J. E., Davis, S. M., Hobbs, G.R., Paulson, D.J., Chinnis, A.S., Heilman, P.L.; 2003; Am J Emerg Med

This study analyzed emergency department (ED) visits to examine the influence of frequent ED visits on early returns to the ED.

Early return visits may be a result of poor quality in the first visit or use of ED for non urgent medical problems and follow-up. Early return visits were more frequent ($p < 0.0001$) when an individual made four or more visits per year.

Oral Antibiotic Use Without Consulting A Physician: A Survey Of ED Patients

Richman, P.B., Garra, G., Eskin, B., Nashed, A.H., Cody, R.; 2001; Am J Emerg Med

This study was a prospective survey of patients presenting to an academic emergency department (ED) to estimate the extent to which patients use antibiotics without consulting a physician.

Patients are inappropriately self-prescribing antibiotics, leading to increased resistance. A significant proportion of patients (17%) reported that they had used "left-over" antibiotics over the past year without consulting their physician, most commonly for a cough (11%) or sore throat (42%), and much less frequently for urinary tract infection (UTI) symptoms (0.7%).

Drug Use Inefficiency: A Hidden Source Of Wasted Health Care

Gillerman, R.G., Browning, R.A.; 2000; Anesth Analg

This study prospectively documented drug waste in a single anesthesia department for one year.

The cost of waste (disposal of full/partially full syringes of drugs) was over \$165,000 annually, representing 26% of the expenditure for all drugs used in the department.

Misuse

Study

Potentially Inappropriate Medication Use By Elderly Persons In U. S. Health Maintenance Organizations: 2000-2001

Simon, S. R., Chan, K.A., Soumerai, S.B., Wagner, A.K., Andrade, S.E., Feldstein, A.C., Lafata, J.E., Davis, R.L. Gurwitz, J. H.; 2005; J Am Geriatr Soc

This study reviewed pharmacy data for 157,517 patients >age 65 who were members of 10 health maintenance organizations (HMOs) to determine the rate at which 33 “potentially inappropriate” meds are prescribed for persons >65 years old in 10 geographically diverse HMOs. Authors examined HMO administrative databases to determine prescriptions that were picked up or delivered to members.

Asthma Medication Use And Disease Burden In Children In A Primary Care Population

Lozano, P., Finkelstein, J. A., Hecht, J., Shulruff, R., Weiss, K.B.; 2003; Arch Pediatr Adolesc Med

This study used data from patients enrolled in the Pediatric Asthma Care Patient Outcomes Research Team (PAC PORT) study to describe the use of asthma medications, to determine if the use of “controller” medications and “reliever” medications is consistent with guidelines, and to estimate the adequacy of asthma control.

Outcome

These 33 meds continue to be prescribed at rates similar to those in 1996 despite publication of guidelines advising against this. 28. 1% of subjects received at least 1 of these meds. Women more than men. Those with higher chronic disease scores were more likely to receive an inappropriate prescription.

In a population of children with health insurance, this study found the following to be common: (1) inappropriate reliance on “reliever” medications, and (2) non-adherence to “controller” medications. Inadequate asthma control was common regardless of whether or not “controller” medications were prescribed.

Misuse

Study

Preventable Medical Injuries In Older Patients
Rothschild, J. M., Bates, D.W., Leape, L.L., 2000; Arch Intern Med

The article reviews the literature concerning the broad topic of preventable medical injuries in the elderly, which includes 6 categories: adverse drug events, falls, nosocomial infections, pressure sores, delirium, and surgical and perioperative complications.

Outcome

For each of the six categories of injuries, older patients appear to be at higher risk. For medications, various interventions have been successful, and fall prevention programs have been demonstrated to be effective.

Use Of Inappropriate Prescription Drugs By Older People

Hanlon, J.T., Schmader, K.E., Boulton, C. Artz, M.B., Gross, C.R., Fillenbaum, G.G., Ruby, C.M., Garrard, J.; 2002; J Am Geriatr Soc

This study examined data from 5,742 patients in the Duke Established Populations for Epidemiological Studies of the Elderly in order to determine the prevalence and predictors of inappropriate drug prescribing for community-dwelling older people.

20% of community dwelling seniors are prescribed inappropriate medications.

Update On Drug-Related Problems In The Elderly

Hanlon, J.T., Lindblad, C.I., Hajjar, E. R., McCarthy, T. C. ; 2003; Am J Geriatr Pharmacother

This article reviewed 7 articles published in 2002 and 2003 on drug-related problems, inappropriate prescribing, and adverse drug events in the elderly.

Drug-related problems are common in elderly patients. Three articles described in this review article describe the development of sets of “quality indicators” for medication use in the elderly. Examples of quality indicators include the following: what drugs to avoid in the elderly, what drugs need lab monitoring (such as the international normalized ratio (INO) for warfarin), and what drug-to-drug interactions to watch out for.

Misuse

Study

Outcome

Misdiagnosed Patients With Bipolar Disorder: Comorbidities, Treatment Patterns, And Direct Treatment Costs

Matza, L.S., Rajagopalan, K.S., Thompson, C.L., Lissovoy G.; 2005; J Clin Psychiatry

This study reviews data from the MarketScan Commercial Claims and Encounters (CCE) claims database to examine comorbidities, treatment patterns, and direct treatment costs of patients with bipolar disorder who are misdiagnosed with unipolar depression.

Some patients with bipolar disorder are getting inappropriate care because they are initially misdiagnosed as depressed. The study found that bipolar patients who are initially misdiagnosed as depressed (8%) are more likely to have comorbid personality disorder, psychosis, and substance abuse than patients correctly diagnosed with depression, and more likely to have comorbid general anxiety and panic than patients correctly diagnosed with bipolar disorder.

Acute Stroke: Delays To Presentation And Emergency Department Evaluation

Kothari, R., Jauch, E., Broderick, J., Brott, T., Sauerbeck, L., Khoury, J., Liu, T.; 1999; Ann Emerg Med

Information from 151 stroke patients was obtained in order to document pre-hospital and in-hospital time intervals from stroke onset to emergency department evaluation and to identify factors associated with presentation to the emergency department within 3 hours of symptom onset, which is the current time window for thrombolytic therapy.

There were 151 stroke patients in the study. Time of stroke onset and time to ED arrival were documented for 119 patients. The median time from stroke onset to ED arrival was 5.7 hours. Median time from ED arrival to physician evaluation was 20 minutes. Median time from ED arrival to computed tomographic evaluation was 72 minutes. When patients were asked the main reason they sought medical attention, 40% of those able to be interviewed said that they themselves did not decide to seek medical attention, but rather a friend or family member told them they should go to the hospital.

Inappropriate Medication Prescribing In Residential Care/Assisted Living Facilities

Sloane, P.D., Zimmerman, S., Brown, L.C., Ives, T.J., Walsh, J.F.; 2002; J Am Geriatr Soc

Medical records were reviewed from 2,078 patients from 193 residential care or assisted living facilities in order to identify the extent to which inappropriately prescribed medications (IPMs) are administered and to describe facility and resident factors associated with IPMs.

The majority of patients were taking 5 or more medications. 16.0% of these patients were receiving IPMs. IPM use was associated with the number of medications received, smaller facility bed size, nurse turnover, absence of dementia, low monthly fees, and absence of weekly physician visits.

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Study

Outcome

High Rates Of Adverse Drug Events In A Highly Computerized Hospital
Nebeker, J.R., Hoffman, J.M., Weir, C.R., Bennett, C.L., Hurdle, J.F; 2005; Arch Intern Med

This study retrospectively reviewed admissions to a VAMC to determine the rate and type of inpatient adverse drug events (ADEs) following adoption of a computerized order entry system (CPOE).

During the follow-up period, 483 adverse drug effects (ADEs) were identified, for a rate of 52 ADEs per 100 admissions. Of these, 9% resulted in serious harm. The large majority of errors (86%) occurred at the ordering and monitoring stages.

Frequency, Consequences And Prevention Of Adverse Drug Events
Bates, D.W.; 1999; J Qual Clin Practice

This article reviews the literature regarding adverse drug events and considers in detail the results of the adverse drug event (ADE) prevention Study at Brigham and Women's Hospital.

6% of admissions resulted in an adverse drug event, of which 28% were preventable.

Reducing The Frequency Of Errors In Medicine Using Information Technology
Bates, D.W., Cohen, M., Leape, L.L. Overhage, J.M., Shabot, M.M. Sheridan, T.; 2001; J Am Med Inform Assoc

This paper describes how the frequency and consequences of errors in medical care can be reduced (although in some instances they are potentiated) by the use of information technology in the provision of care, and to make general and specific recommendations regarding error reduction through the use of information technology.

Computerized physician order entry systems can decrease the rate of serious medication errors by 55%, and overall medication errors by 83%.

Misuse

Study

Pediatric Medication Errors: What Do We Know? What Gaps Remain?

Kaushal, R., Jaggi, T. Walsh, K., Fortescue, E. B., Bates, D.W.; 2004; *Ambul Pediatr*

This study builds on other classic Harvard studies and published literature to assess the causes and frequency of pediatric medication errors.

Incidence And Preventability Of Adverse Drug Events Among Older Persons In The Ambulatory Care Setting

Gurwitz, J.H., Field, T.S., Avorn, J., McCormick, D., Jain, S., Eckler, M., Benser, M., Edmondson, A.C., Bates, D.W.; 2003; *JAMA*

This study employed a cohort of 30,397 Medicare beneficiaries in a multispecialty group practice to estimate the incidence of adverse drug events (ADEs). ADEs were detected via provider reporting, claims and chart review, and administrative reporting.

Adverse Drug Events In Emergency Department Patients

Hafner, J.W., Jr., Belknap, S.M., Squillante, M.D., Bucheit, K.A.; 2002; *Ann Emerg Med*

This was a retrospective review of visits to a tertiary academic emergency department (ED) to examine the rate and consequences of adverse drug events (ADEs) in an emergency department setting.

Outcome

Pediatric medication errors are common. 6% of pediatric prescriptions may contain an error, and 2.3%-6% of pediatric inpatients may suffer an adverse drug event (ADE).

During the follow-up period, 1,523 ADEs were identified, of which 28% were considered preventable. 38% of ADEs were considered serious, life-threatening, or fatal, of which 42% were deemed preventable. Errors occurred most frequently at the stages of prescribing and monitoring.

During the follow-up period, 321 suspected and 217 probable ADEs were identified. Most occurred prior to ED evaluation. Insulin and warfarin were the drugs most often associated with ADEs.

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Study

Outcome

Medication Errors And Adverse Drug Events In Pediatric Inpatients

Kaushal, R., Bates, D.W., Landrigan, C., McKenna, K.J., Clapp, M.D., Federico, F., Goldmann, D.A.; 2001; JAMA

During the follow-up period, 616 medication errors, 115 potential adverse drug events (ADEs), and 26 ADEs were detected. Of the ADEs, 5 (19%) were preventable. Most errors occurred at the drug ordering stage.

This prospective study conducted at Children's Hospital Boston and Brigham & Women's Hospital followed a cohort of 1,120 pediatric patients to estimate the frequency of ADEs.

Mistakes Happen. Improved Processes Mean Fewer Mistakes.

Bubin, C.; 1999; Ambul Outreach

Mistakes in medical care can be avoided by improving quality during the patient visit.

This article discusses avoiding mistakes by improving quality DURING the patient visit process. (This is in contrast to doing quality inspection AFTER an error has occurred, when it is already too late to help that individual patient.)

Use Of Hospital Emergency Departments For Nonurgent Care: A Persistent Problem With No Easy Solutions

Gill, James; 1999; Am J Manag Care

Educational pamphlets and nurse advice lines did not significantly alter inappropriate ED use.

This editorial discusses the role of educational materials and 24/7 nurse advice lines in reducing inappropriate emergency department (ED) use.

Potential For Misuse Of Sedatives

Sareen, J., Enns, M.W., Cox, B.J.; 2004; Am J Psychiatry

The letter expresses concern that lifetime prevalence of benzodiazepine abuse is too high to take lightly, citing such statistics as 1. 2% in the epidemiologic catchment area (ECA), and 0. 3% in an analysis of theirs, with 4. 3% non-prescription use. They point out that lifetime sedative misuse has a high correlation with psychiatric disorders.

This letter responds to a review article on the public health problem of insomnia which indicated that "the liability of abuse of benzodiazepines is generally low. "

Misuse

Study

Outcome

Poverty, Health Care, And Problems Of Prescription Medication: A Case Study
Anglin, M.K., White, J.C.; 1999; Subst Use Misuse

This study used observational and interview methods to examine the relationship between poverty, limited access to health care, and prescription medication use and misuse in rural eastern Kentucky.

Four patterns of prescription drug misuse are documented in this study: 1) the over-use of medications; 2) the acquisition of prescription drugs for the purpose of resale through illegal channels; 3) the borrowing or “swapping” of medications through informal exchange; and 4) the under- or non-use of prescription drugs.

Disparities In Dental Service Utilization Among Alabama Medicaid Children
Dasanayake, A.P., Li, Y., Wadhawan, S. Kirk, K., Bronstein, J., Childers, N.K.; 2002; Community Dent Oral Epidemiol

To evaluate the effect of racial and other factors related to dental care utilization among Medicaid eligible children.

Dental services are used by a minority of Medicaid-eligible children. Fewer black children (24%) and other non-white racial groups (22%) utilized dental services compared with white children (31%). Fewer adolescents aged 15-19 (15%) obtained dental care compared with younger age groups (30%).

Potentially Inappropriate Medication Prescriptions Among Elderly Nursing Home Residents: Their Scope And Associated Resident And Facility Characteristics
Lau, D.T., Kasper, J.D., Potter, D.E., Lyles, A., Potentially Inappropriate Medication; 2004; Health Serv Res

To estimate the scope of potentially inappropriate medication prescriptions (PIRx), among U. S. nursing home residents and to examine facility and patient characteristics associated with such PIRx.

Potentially inappropriate medication prescriptions (PIRx) are common among NH residents older than 65 years of age. 50% of patients who resided in NH for more than 3 months in 1996 received at least 1 PIRx; 40% represented an “inappropriate choice”, 11% excess dosage, 13% drug-disease interaction. In 35% of cases the PIRx persisted for the entire year. 34% of the PIRx were “severe.”

Misuse

Study

Prevalence Of Illicit Drug Use Among Individuals With Chronic Pain In The Commonwealth Of Kentucky: An Evaluation Of Patterns And Trends.

Manchikanti, L., Fellows, B., Damron, K.S., Pampati, V., McManus, C.D.; 2005; J Ky Med Assoc

A study of patients receiving controlled substances in an interventional pain management practice in Western Kentucky to evaluate the prevalence of illicit drug use, opioid abuse and noncompliance with opioid therapy.

Outcome

Overall illicit drug use, opioid abuse and noncompliance of opioids are significant in Western Kentucky patients receiving Medicaid as primary insurance or as supplemental insurance to Medicare. Patients with third-party insurance showed 17% prevalence of illicit drug use; with Medicare with or without third party insurance 10%; Medicare and Medicaid 24%; and patients with only Medicaid 39%.

Antibiotic Resistance And The Need For The Rational Use Of Antibiotics

Hueston, W. J., Dickerson, L. ; 2001; J Med Liban

This article reviews common reasons for overuse of antibiotics in primary care settings and some strategies for reducing inappropriate antibiotic prescribing.

There are several reasons for antibiotic overuse in primary care settings. There are multiple different strategies that can be used to combat this problem.

The Glaucoma Medications Taken By Their Patients

Jampel, H.D., Parekh, P., Johnson, E., Miller, R., Chart Documentation By General Physicians Of; 2005; Am J Ophthalmol

Chart review of primary care physicians (PCPs) caring for glaucoma patients to determine the accuracy of documentation of eye drops used by these patients.

PCPs may not be completely documenting medicines their patients are being prescribed by specialists. The study found that many patients taking glaucoma eye drops according to their specialists' charts did not have record of glaucoma or the medicines in their PCPs charts. 14% had no mention of glaucoma or drops; 31% mentioned glaucoma, but not drops; 8% mentioned glaucoma and "eyedrops" without specifying medication(s); 7% specified eyedrops, but no glaucoma; 40% mentioned glaucoma and specific drops.

Misuse

Study

Outcome

Medication Use In Nursing Homes For Elderly People

Furniss, L., Craig, S.K., Burns, A.; 1998; Int J Geriatr Psychiatry

This article reviews the topic of psychotropic drug use in nursing homes.

A number of studies have highlighted the overuse of psychotropic drugs. The identification of methods by which to improve awareness of inappropriate medication prescription and to avoid certain types of drugs is required.

Evaluating The Capability Of Information Technology To Prevent Adverse Drug Events: A Computer Simulation Approach

Anderson, J.G., Jay, S.J., Anderson, M., Hunt, T.J.; 2002; J Am Med Inform Assoc

This study used a computer simulation model to estimate how effective information technology applications were in detecting and preventing medication errors and the resulting adverse drug events (ADEs). The study used data from one private teaching hospital.

The computer simulation model estimated that an integrated medication delivery system can save up to 1,226 days of excess hospitalization and \$1.4 million in associated costs annually in a large hospital.

Ciprofloxacin Use And Misuse In The Treatment Of Travelers' Diarrhea

Day, L.J., Golden, W., Lannen, L., Engleberg, N.C.; 2003; Am J Med

This study, which is described in a letter to the editor, conducted post-travel telephone interviews of 99 people who had attended a travel clinic before their travels. The goal was to describe their pattern of use of ciprofloxacin, which had been prescribed in case of traveler's diarrhea.

Only 7 of the 17 patients who had traveler's diarrhea took ciprofloxacin, even though they had been prescribed the medicine. Only 2 patients took ciprofloxacin as directed.

Misuse

Study

Drug-Related Morbidity And Mortality: Updating The Cost-Of-Illness Model
Ernst, F.R., Grizzle, A.J.; 2001; J Am Pharm Assoc (Wash)

To estimate the annual morbidity and mortality from “drug-related problems” (DRPs) including untreated indication, improper drug selection, sub-therapeutic dose, failure to receive drugs, overdosage, adverse drug reactions, drug interactions, and drug use without indication.

Incidence And Preventability Of Adverse Drug Events In Nursing Homes

Gurwitz, J.H., Field, T.S., Avorn, J. McCormick, D., Jain, S., Eckler, M., Benser, M., Edmondson, A.C., Bates, D.W.; 2000; Am J Med

Adverse drug events (ADEs), especially those that may have been preventable, are among the most serious concerns about medication use in nursing homes. We studied the incidence and preventability of ADEs and potential adverse drug events in nursing homes.

The Incidence Of Adverse Drug Events In Two Large Academic Long-Term Care Facilities

Gurwitz, J.H., Field, T.S., Harrold, L.R., Rothschild, J., Debellis, K., Seger, A.C., Cadoret, C., Fish, L.S., Garber, L., Kelleher, M., Bates, D.W.; 2005; Am J Med

This study used chart reviews of 1,247 residents of academic long term care facilities to estimate the incidence of adverse drug events (ADEs) in long- term care settings.

Outcome

Using a decision-analytic model, the authors estimate the cost of drug-related morbidity and mortality in the year 2000 to be \$177. 4 billion. Hospitalization accounted for approximately 70% of total cost.

During the year of follow-up, there were 546 ADEs of which 51% were thought to be preventable. Preventable errors occurred most commonly at the stages of ordering and monitoring.

During the follow-up period, 815 ADE were identified (9. 8 per 100 patient-months), of which 42% were deemed preventable. Errors were most likely to occur at the ordering and monitoring stages. Patients taking antipsychotics, anticoagulants, diuretics, and antiepileptics were at increased odds of ADEs.

