

Mortality and Morbidity Associated With Complications of Medical and Surgical Care California, 2000-2002

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Introduction

Previous studies examining the epidemiology of adverse medical events indicate that iatrogenic injuries (i.e., those caused by medical treatment) and medical and surgical complications are serious health care threats with annual costs to the nation in the billions of dollars.¹⁻⁵ A great deal of attention has been given to the issues of medical errors, surgical complications, and patient safety in the decade between the creation of the Agency for Healthcare Research and Quality, formerly the Agency for Health Care Policy and Research (AHCPR), in 1989 and the publication of the Institute of Medicine (IOM) report "To Err Is Human: Building a Safer Health Care System" in 1999. Studies using state-level population groups have been sparse, however. The IOM report used state data from two relatively small empirical studies, one from Colorado and Utah (1992) and one from New York (1984), to extrapolate estimates that suggested as many as 44,000 – 98,000 deaths a year nationally may be attributable to medical errors, with health care related costs of between \$8.5 - \$14.5 billion a year. Based on these estimates, deaths due to hospital-based errors would exceed the number of deaths attributable to the tenth leading cause of death in the United States.⁶ Another study commissioned by the California Healthcare Foundation has estimated that 10,000 people die each year in California hospitals from preventable medical errors, and that 140,000 people are injured as a result of medical treatment.⁷

California legislated the first of what turned out to be multiple state responses to the 1999 IOM study on preventable medical errors. Senate Bill (SB) 1875, "Minimization of Medication-Related Errors", was enacted in 2000 and was designed to implement some of the recommendations made in the IOM study.⁸ This act, and subsequent legislation (SB 801) enacted in 2002, requires all general acute-care hospitals, specialty hospitals, and surgical clinics to adopt a formal plan to eliminate or substantially reduce medication-related errors as a condition of licensure. Each facility was required to submit a comprehensive plan to the California Department of Health Services (CDHS) by January 1, 2002, and to implement that plan by January 1, 2005.

This exploratory analysis responds to one of the CDHS Strategic Plan key issues – to improve health status and outcomes – and was undertaken to address the need for California-specific information on mortality and morbidity associated with complications resulting from medical care and surgical procedures utilizing currently available data resources.⁹

Methods

Data Sources and Definitions

Mortality data were extracted from the Multiple Cause of Death (MCOB) files created by the National Center for Health Statistics (NCHS), and tabulated by age, race-ethnicity, and gender for the period 2000-2002.¹⁰ Deaths attributed to “complications of medical and surgical care” are operationally defined by *International Classification of Diseases, Tenth Revision* (ICD-10) codes Y40-Y84 and Y88 (see Appendix I for a complete listing).¹¹

Morbidity data from the Patient Discharge Data (PDD) files created by California’s Office of Statewide Health Planning and Development (OSHPD) were used in this analysis.¹² “Complications resulting from medical treatments or procedures during a hospitalization” have been defined by an *International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM) diagnostic code set developed and published by the AHCPR, based on the previous work of DesHarnais (1990).¹³⁻¹⁵ The guiding principle in selecting these codes was to focus on complications of the current hospitalization or of previous medical procedures (see Appendix II for a complete listing).

Data Limitations and Qualifications

Both underlying and contributing causes of death were examined in this analysis. An **underlying** cause of death is defined as “(a) the disease or injury which initiated the train of events leading directly to death, or (b) the circumstances of the accident or violence which produced the fatal injury.”¹⁶ As a statistical datum, underlying cause of death is a simple, one-dimensional statistic; it is conceptually easy to understand and a well-accepted measure of mortality. It identifies the initiating cause of death and is therefore most useful to public health officials in developing measures to prevent the onset of the chain of events leading to death. However, because most deaths are the result of more than one disease entity, a single underlying cause excludes much useful information on intervening, contributory, and concurrent conditions.¹⁷ A **contributing** cause of death is operationally defined as any mention of a medical or surgical complication ICD-10 code as an “other than underlying” or a “contributing” cause of death, which are extracted from the MCOB file’s record axis codes.¹⁸

The ICD-9-CM code set used by the AHCPR to define hospitalizations due to complications of medical and surgical care excluded many conditions, such as “poisoning by drugs, medicinal and biological substances” (codes 960.0-979.9). In addition, the present analysis used only the Principal Diagnosis and excluded up to 24 Other Diagnoses available in the hospital discharge record. Although the intent was to identify medical and surgical complications as accurately as possible and to provide a direct causal link to the current hospitalization, this methodology at best would underestimate the true rate of complications.

Both mortality and morbidity data were extracted by place of residence, rather than place of occurrence. This method excludes all records involving persons who live or maintain their legal residency outside of California, as well as those whose residence is missing or unknown.

Age-Adjusted Rates

Age-adjusted death rates are hypothetical rates obtained by calculating age-specific rates for each subpopulation and multiplying these rates by proportions of the same age categories in a standard population, then summing the apportioned specific rates to a total.¹⁹ The "standard population" used in the age-adjusted rates in this report is the 2000 United States Standard Population. The age-adjusted rates put all subgroups on an equal basis with respect to the effect of age and permit direct comparisons among subgroups and across time periods. It is important to understand that age-adjusted rates be viewed as hypothetical constructs or index numbers rather than as actual measures of the risk of mortality or morbidity.

Reliability of Rates

All mortality and morbidity rates are subject to random variation. This variation is inversely related to the number of events (e.g., deaths or hospitalizations) used to calculate the rate. The smaller the frequency of occurrence of an event, then the greater the likelihood of random fluctuations within a specified time period or a certain population group. The more rare an event, the less stable its occurrence is from observation to observation. As a consequence, populations with only a few events can have highly unstable rates from year-to-year.

The "standard error" of a rate and the "coefficient of variation" (or Relative Standard Error, [RSE]) provide a rational basis for determining which rates may be considered "unreliable." In this report, populations with a relative standard error of greater than or equal to 23 percent of the rate are marked as "Data Statistically Unreliable" (DSU). This criterion conforms to the standard used by the NCHS in determining the reliability cut-off for rates and percents.²⁰

Statistical Tests

A confidence interval (CI) is a range of values that is normally used to describe the uncertainty around a point estimate of a rate. CIs are a measure of the variability in the data and describe how much different the point estimate could have been if the underlying conditions stayed the same but chance had led to a different set of data. CIs are calculated with a stated probability (i.e., 95 percent), such that there is a 95 percent chance that the CI covers the true value. The true population value is a constant, even though its value is unknown, but a CI is a random quantity whose value depends on the data from which it is calculated.

The 95 percent CIs correspond to a p-value of 0.05, so if you are making many comparisons approximately five percent of the comparisons may be statistically significant due to chance alone. In general, if CIs for two separate rates overlap, there is no statistically significant difference between the two rates. In a one sample case, as for example if one is comparing the age-adjusted rate for a particular racial or ethnic group to a standard value, CIs are equivalent to statistical tests. That is, if a 95 percent confidence interval around a particular age-adjusted rate excludes the comparison value, then a statistical test for the difference between the two values would be significant at the 0.05 level.²¹

Results

Mortality (Table 1, Figure 1)

During 2000, a total of 2,700 deaths among California residents were associated with complications of medical and surgical care as either an underlying or contributing cause of death at a rate of 9.1 per 100,000 population. These figures dropped significantly in 2001 to 2,628 deaths at a rate of 8.5 per 100,000 population, but increased significantly to 3,070 deaths and a rate of 9.5 per 100,000 in 2002.

Examined by gender, death rates for males were significantly higher than those for females across all three years.

African Americans/Blacks had significantly higher death rates than all other racial and ethnic groups across all three years, with the exception of Whites in 2001. Whites had the second highest death rates, followed by Hispanics/Latinos and then by Asians/Pacific Islanders. Mortality rates for American Indians/Alaska Natives were unreliable due to small numbers of events.

Table 1-A shows a three-year summary of the leading underlying causes of death (N=523) associated with complications of medical and surgical care, ranked in descending order by frequency of occurrence. The top ten underlying causes of death were:

- 1) Y83.8 Other surgical procedures as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=65);
- 2) Y84.8 Other medical procedures as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=57);
- 3) Y83.1 Surgical operation with implant of artificial internal device as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=45);
- 4) Y83.9 Surgical procedures, unspecified, as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=42);

- 5) Y83.6 Removal of organ as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=40);
- 6) Y83.3 Surgical operation with formation of external stoma as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=32);
- 7) Y83.4 Other reconstructive surgery as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=31);
- 8) Y83.2 Surgical operation with anastomosis, bypass, or graft as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=22);
- 9) Y88.3 Sequelae of surgical or medical procedures as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=21); and tied for tenth
- 10) Y83.5 Amputation of limb(s) and 10) Y84.6 Urinary catheterization as the causes of abnormal reaction of the patient or of later complication, without mention of misadventure (n=16).

Table 1-B shows a three-year summary of the leading contributing causes of death (N=8,023) associated with complications of medical and surgical care, ranked in descending order by frequency of occurrence. Seven of the top ten underlying causes of death were also found in the top ten contributing causes list: Y83.2 (n=1,089); Y83.6 (n=912); Y83.1 (n=657); Y84.8 (n=568); Y83.8 (n=520); Y83.4 (n=412); and Y83.9 (n=335). The three other contributing causes of death in the top ten list were: Y44.2 Anticoagulants causing adverse effects in therapeutic use (n=412); Y43.3 Other antineoplastic drugs causing adverse effects in therapeutic use (n=411); and Y84.2 Radiological procedure and radiotherapy as the cause of abnormal reaction of the patient or of later complication, without mention of misadventure (n=363).

Morbidity (Table 2, Figure 2)

Hospital discharges among Californians for complications of medical and surgical care increased from 79,405 in 2000 to 85,380 in 2002. Discharge rates increased significantly from 254.3 per 100,000 population in 2000 to 257.3 per 100,000 in 2001, but there was not a significant difference between rates for 2001 and 2002.

Discharge rates for males were significantly higher than those for females across all three years examined.

As with mortality rates, morbidity rates were significantly higher for African Americans/Blacks than for all other racial and ethnic groups. The second highest rates were found for Whites, followed by Hispanics/Latinos, Asians/Pacific Islanders, and American Indians/Alaska Natives.

Table 2-A shows a three-year summary of the leading principal diagnoses associated with hospitalizations for complications of medical and surgical care (N=247,585), ranked in descending order by frequency of occurrence. Also

provided in this table are the hospital charges associated with each discharge diagnosis. The top ten discharge diagnoses were:

- 1) 998.59 Other postoperative infection (n=33,710; \$1.2 billion)
- 2) 996.4 Mechanical complication of internal orthopedic device (n=28,806; \$1.2 billion)
- 3) 996.73 Other complications due to renal dialysis device (n=20,582; \$598 million)
- 4) 996.62 Infection and inflammatory reaction due to vascular device (n=20,553; \$952 million)
- 5) 997.4 Gastrointestinal complications not elsewhere classified (n=13,028; \$417 million)
- 6) 996.74 Other complications due to vascular dialysis device (n=10,134; \$479 million)
- 7) 996.2 Mechanical complication of nervous system device (n=5,399; \$172 million)
- 8) 996.81 Complications of transplanted kidney (n=5,361; \$181 million)
- 9) 996.66 Infection / inflammatory reaction due to internal joint prosthesis (n=5,177; \$315 million)
- 10) 996.72 Other complications due to cardiac device, implant, and graft (n=4,650; \$220 million)

Total hospital charges for 2000-2002 for discharges with medical and surgical complications as the principal diagnosis exceeded \$9.3 billion.

Discussion

California is one of at least 20 other states that have passed various forms of legislation related to medical and surgical errors, but is the first to pass legislation directed at trying to reduce the rate of errors.²² The observations and findings from this study must be interpreted within the limitations of an exploratory data analysis of California death certificates and hospital discharge records using a selected set of ICD codes to define “complications of medical and surgical care”. Although these data sources can be used to extract detailed information on those who have experienced negative consequences due to complications of medical and surgical care, they may not provide sufficient epidemiological evidence or clinical insight into their specific causes nor to their prevention. Furthermore, the extent of underreporting of medical and surgical complications on California death certificates and hospital discharge records is unknown. As our knowledge base increases and as more refined definitions of complications of medical treatments and surgical procedures become available, better data and estimates of future targets for reductions may be attainable. In this context, the continued monitoring of mortality and morbidity associated with complications of care among Californians is recommended.

References

1. Institute of Medicine. To Err Is Human: Building A Safer Health System. Washington, D.C.: National Academy Press, 1999.
2. Brennan, T.A., et al. Incidence of adverse events and negligence in hospitalized patients: Results of the Harvard Medical Practice Study I. *New England Journal of Medicine*, 1991;324(6), 370-376.
3. Office of the Medical Inspector. VA patient safety event registry: First nineteen months of reported cases, summary and analysis. Washington, D.C.: Department of Veterans Affairs, Veterans Health Administration, July 15, 1999.
4. Agency for Healthcare Research and Quality. Translating research into practice: Reducing errors in health care. Rockville, MD: AHRQ Publication No. 00-P058, April 2000. <http://www.ahrq.gov/qual/errorsix.htm>
5. Baker, G.R., et al. The Canadian adverse events study: The incidence of adverse events among patients in Canada. *Canadian Medical Association Journal*, 2004; 170(11), 1678-1686.
6. Personal communication, Robert N. Anderson, Ph.D., Chief, Mortality Statistics Branch, National Center for Health Statistics, November 30, 2004.
7. Spurlock, B., et al. Legislating medication safety: The California experience. Oakland, CA: California HealthCare Foundation, October 2003.
8. SB 1875 and SB 801. <http://www.leginfo.ca.gov/bilinfo.html>
9. California Department of Health Services. Leadership for a Healthy California: A Strategic Plan for the California Department of Health Services. Sacramento, CA: CDHS, March 2002.
10. National Center for Health Statistics. Multiple Cause-Of-Death Data. http://www.cdc.gov/nchs/products/elec_prods/subject/mortmcd.htm
11. World Health Organization. International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (ICD-10). Geneva, Switzerland: WHO, 1992.
12. California Office of Statewide Health Planning and Development. Patient Discharge Data. <http://www.oshpd.ca.gov/HQAD/PatientLevel/index.htm>

13. Practice Management Information Corporation. International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM). Los Angeles, CA: PMIC, 1998.
14. Elixhauser, A., Johantgen, M., and Andrews, R. Descriptive statistics by insurance status for most frequent hospital diagnoses and procedures. Rockville, MD: Agency for Health Care Policy and Research, Healthcare Cost and Utilization Project (HCUP-3), Research Note 5, 1997 (AHCPR publication no. 97-0009).
15. DesHarnais, S. Current uses of large data sets to assess the quality of providers, constructions of risk-adjusted indexes of hospital performance. *International Journal of Technology Assessment in Health Care*, 1990;6(2), 229-238.
16. U.S. Department of Health and Human Services. Technical Appendix from Vital Statistics of the United States, 1999: Mortality. Hyattsville, MD: National Center for Health Statistics, July 2004.
17. Israel, R.A., Rosenberg, H.M., and Curtin, L.R. Analytical potential for multiple cause-of-death data. *American Journal of Epidemiology*, 1986; 124(2), 161-179.
18. U.S. Department of Health and Human Services. Multiple causes of death in the United States. *Monthly Vital Statistics Report*, 1984;32(10), Supplement (2).
19. Klein, R.J. and Schoenborn, C.A. Age adjustment using the 2000 projected U.S. population. Hyattsville, MD: National Center for Health Statistics, *Healthy People 2010 Statistical Notes*, No. 20, January 2001.
20. Klein, R.J., et al. Healthy People 2010 criteria for data suppression. Hyattsville, MD: National Center for Health Statistics, *Healthy People 2010 Statistical Notes*, No. 24, July 2002.
21. Washington State Department of Health. Guidelines for using confidence intervals for public health assessments. <http://www.doh.wa.gov/Data/Guidelines/ConfIntguide.htm>
22. Handler, T.J. and Hieb, B.R. California: Leading the charge in medical error reduction. Gartner, Inc., Healthcare Research Note E-12-4300, November 2000.

Appendix I. Cause-of-death codes associated with complications of medical and surgical care

ICD-10 code	Description
<i>Drugs, medicaments and biological substances causing adverse effects in therapeutic use (Y40-Y59)</i>	
Y40	Systemic antibiotics
Y40.0	Penicillins
Y40.1	Cefalosporins and other β -lactam antibiotics
Y40.2	Chloramphenicol group
Y40.3	Macrolides
Y40.4	Tetracyclines
Y40.5	Aminoglycosides
Y40.6	Rifamycins
Y40.7	Antifungal antibiotics, systemically used
Y40.8	Other systemic antibiotics
Y40.9	Systemic antibiotic, unspecified
Y41	Other systemic anti-infectives and antiparasitics
Y41.0	Sulfonamides
Y41.1	Antimycobacterial drugs
Y41.2	Antimalarials and drugs acting on other blood protozoa
Y41.3	Other antiprotozoal drugs
Y41.4	Anthelmintics
Y41.5	Antiviral drugs
Y41.8	Other specified systemic anti-infectives and antiparasitics
Y41.9	Systemic anti-infective and antiparasitic, unspecified
Y42	Hormones and their synthetic substitutes and antagonists, not elsewhere classified
Y42.0	Glucocorticoids and synthetic analogues
Y42.1	Thyroid hormones and substitutes
Y42.2	Antithyroid drugs
Y42.3	Insulin and oral hypoglycaemic [antidiabetic] drugs
Y42.4	Oral contraceptives
Y42.5	Other estrogens and progestogens
Y42.6	Antigonadotrophins, antiestrogens, antiandrogens, not elsewhere classified
Y42.7	Androgens and anabolic congeners
Y42.8	Other and unspecified hormones and their synthetic substitutes
Y42.9	Other and unspecified hormone antagonists
Y43	Primarily systemic agents
Y43.0	Antiallergic and antiemetic drugs
Y43.1	Antineoplastic antimetabolites
Y43.2	Antineoplastic natural products
Y43.3	Other antineoplastic drugs
Y43.4	Immunosuppressive agents
Y43.5	Acidifying and alkalizing agents
Y43.6	Enzymes, not elsewhere classified
Y43.8	Other primarily systemic agents, not elsewhere classified
Y43.9	Primarily systemic agent, unspecified
Y44	Agents primarily affecting blood constituents
Y44.0	Iron preparations and other anti-hypochromic-anaemia preparations
Y44.1	Vitamin B ₁₂ , folic acid and other anti-megaloblastic-anaemia preparations
Y44.2	Anticoagulants
Y44.3	Anticoagulant antagonists, vitamin K and other coagulants
Y44.4	Antithrombotic drugs [platelet-aggregation inhibitors]

Y44.5	Thrombolytic drugs
Y44.6	Natural blood and blood products
Y44.7	Plasma substitutes
Y44.9	Other and unspecified agents affecting blood constituents
Y45	Analgesics, antipyretics and anti-inflammatory drugs
Y45.0	Opioids and related analgesics
Y45.1	Salicylates
Y45.2	Propionic acid derivatives
Y45.3	Other nonsteroidal anti-inflammatory drugs [NSAID]
Y45.4	Antirheumatics
Y45.5	4-Aminophenol derivatives
Y45.8	Other analgesics and antipyretics
Y45.9	Analgesic, antipyretic and anti-inflammatory drug, unspecified
Y46	Antiepileptics and antiparkinsonism drugs
Y46.0	Succinimides
Y46.1	Oxazolidinediones
Y46.2	Hydantoin derivatives
Y46.3	Deoxybarbiturates
Y46.4	Iminostilbenes
Y46.5	Valproic acid
Y46.6	Other and unspecified antiepileptics
Y46.7	Antiparkinsonism drugs
Y46.8	Antispasticity drugs
Y47	Sedatives, hypnotics and antianxiety drugs
Y47.0	Barbiturates, not elsewhere classified
Y47.1	Benzodiazepines
Y47.2	Cloral derivatives
Y47.3	Paraldehyde
Y47.4	Bromine compounds
Y47.5	Mixed sedatives and hypnotics, not elsewhere classified
Y47.8	Other sedatives, hypnotics and antianxiety drugs
Y47.9	Sedative, hypnotic and antianxiety drug, unspecified
Y48	Anaesthetics and therapeutic gases
Y48.0	Inhaled anaesthetics
Y48.1	Parenteral anaesthetics
Y48.2	Other and unspecified general anaesthetics
Y48.3	Local anaesthetics
Y48.4	Anaesthetic, unspecified
Y48.5	Therapeutic gases
Y49	Psychotropic drugs, not elsewhere classified
Y49.0	Tricyclic and tetracyclic antidepressants
Y49.1	Monoamine-oxidase-inhibitor antidepressants
Y49.2	Other and unspecified antidepressants
Y49.3	Phenothiazine antipsychotics and neuroleptics
Y49.4	Butyrophenone and thioxanthene neuroleptics
Y49.5	Other antipsychotics and neuroleptics
Y49.6	Psychodysleptics [hallucinogens]
Y49.7	Psychostimulants with abuse potential
Y49.8	Other psychotropic drugs, not elsewhere classified
Y49.9	Psychotropic drug, unspecified
Y50	Central nervous system stimulants, not elsewhere classified
Y50.0	Analeptics
Y50.1	Opioid receptor antagonists
Y50.2	Methylxanthines, not elsewhere classified
Y50.8	Other central nervous system stimulants
Y50.9	Central nervous system stimulant, unspecified

Y51	Drugs primarily affecting the autonomic nervous system
Y51.0	Anticholinesterase agents
Y51.1	Other parasympathomimetics [cholinergics]
Y51.2	Ganglionic blocking drugs, not elsewhere classified
Y51.3	Other parasympatholytics [anticholinergics and antimuscarinics] and spasmolytics, not elsewhere classified
Y51.4	Predominantly α -adrenoreceptor agonists, not elsewhere classified
Y51.5	Predominantly β -adrenoreceptor agonists, not elsewhere classified
Y51.6	α -Adrenoreceptor antagonists, not elsewhere classified
Y51.7	β -Adrenoreceptor antagonists, not elsewhere classified
Y51.8	Centrally acting and adrenergic-neuron-blocking agents, not elsewhere classified
Y51.9	Other and unspecified drugs primarily affecting the autonomic nervous system
Y52	Agents primarily affecting the cardiovascular system
Y52.0	Cardiac-stimulant glycosides and drugs of similar action
Y52.1	Calcium-channel blockers
Y52.2	Other antidysrhythmic drugs, not elsewhere classified
Y52.3	Coronary vasodilators, not elsewhere classified
Y52.4	Angiotensin-converting-enzyme inhibitors
Y52.5	Other antihypertensive drugs, not elsewhere classified
Y52.6	Antihyperlipidaemic and antiarteriosclerotic drugs
Y52.7	Peripheral vasodilators
Y52.8	Antivaricose drugs, including sclerosing agents
Y52.9	Other and unspecified agents primarily affecting the cardiovascular system
Y53	Agents primarily affecting the gastrointestinal system
Y53.0	Histamine H ₂ -receptor antagonists
Y53.1	Other antacids and anti-gastric-secretion drugs
Y53.2	Stimulant laxatives
Y53.3	Saline and osmotic laxatives
Y53.4	Other laxatives
Y53.5	Digestants
Y53.6	Antidiarrhoeal drugs
Y53.7	Emetics
Y53.8	Other agents primarily affecting the gastrointestinal system
Y53.9	Agent primarily affecting the gastrointestinal system, unspecified
Y54	Agents primarily affecting water-balance and mineral and uric acid metabolism
Y54.0	Mineralocorticoids
Y54.1	Mineralocorticoid antagonists [aldosterone antagonists]
Y54.2	Carbonic-anhydrase inhibitors
Y54.3	Benzothiadiazine derivatives
Y54.4	Loop [high-ceiling] diuretics
Y54.5	Other diuretics
Y54.6	Electrolytic, caloric and water-balance agents
Y54.7	Agents affecting calcification
Y54.8	Agents affecting uric acid metabolism
Y54.9	Mineral salts, not elsewhere classified
Y55	Agents primarily acting on smooth and skeletal muscles and the respiratory system
Y55.0	Oxytocic drugs
Y55.1	Skeletal muscle relaxants [neuromuscular blocking agents]
Y55.2	Other and unspecified agents primarily acting on muscles
Y55.3	Antitussives
Y55.4	Expectorants
Y55.5	Anti-common-cold drugs
Y55.6	Antiasthmatics, not elsewhere classified
Y55.7	Other and unspecified agents primarily acting on the respiratory system

Y56	Topical agents primarily affecting skin and mucous membrane and ophthalmological, otorhinolaryngological and dental drugs
Y56.0	Local antifungal, anti-infective and anti-inflammatory drugs, not elsewhere classified
Y56.1	Antipruritics
Y56.2	Local astringents and local detergents
Y56.3	Emollients, demulcents and protectants
Y56.4	Keratolytics, keratoplastics and other hair treatment drugs and preparations
Y56.5	Ophthalmological drugs and preparations
Y56.6	Otorhinolaryngological drugs and preparations
Y56.7	Dental drugs, topically applied
Y56.8	Other topical agents
Y56.9	Topical agent, unspecified
Y57	Other and unspecified drugs and medicaments
Y57.0	Appetite depressants [anorectics]
Y57.1	Lipotropic drugs
Y57.2	Antidotes and chelating agents, not elsewhere classified
Y57.3	Alcohol deterrents
Y57.4	Pharmaceutical excipients
Y57.5	X-ray contrast media
Y57.6	Other diagnostic agents
Y57.7	Vitamins, not elsewhere classified
Y57.8	Other drugs and medicaments
Y57.9	Drug or medicament, unspecified
Y58	Bacterial vaccines
Y58.0	BCG vaccine
Y58.1	Typhoid and paratyphoid vaccine
Y58.2	Cholera vaccine
Y58.3	Plague vaccine
Y58.4	Tetanus vaccine
Y58.5	Diphtheria vaccine
Y58.6	Pertussis vaccine, including combinations with a pertussis component
Y58.8	Mixed bacterial vaccines, except combinations with a pertussis component
Y58.9	Other and unspecified bacterial vaccines
Y59	Other and unspecified vaccines and biological substances
Y59.0	Viral vaccines
Y59.1	Rickettsial vaccines
Y59.2	Protozoal vaccines
Y59.3	Immunoglobulin
Y59.8	Other specified vaccines and biological substances
Y59.9	Vaccine or biological substance, unspecified

Misadventures to patients during surgical and medical care (Y60-Y69)

Y60	Unintentional cut, puncture, perforation or hemorrhage during surgical and medical care
Y60.0	During surgical operation
Y60.1	During infusion or transfusion
Y60.2	During kidney dialysis or other perfusion
Y60.3	During injection or immunization
Y60.4	During endoscopic examination
Y60.5	During heart catheterization
Y60.6	During aspiration, puncture and other catheterization
Y60.7	During administration of enema
Y60.8	During other surgical and medical care
Y60.9	During unspecified surgical and medical care

Y61	Foreign object accidentally left in body during surgical and medical care
Y61.0	During surgical operation
Y61.1	During infusion or transfusion
Y61.2	During kidney dialysis or other perfusion
Y61.3	During injection or immunization
Y61.4	During endoscopic examination
Y61.5	During heart catheterization
Y61.6	During aspiration, puncture and other catheterization
Y61.7	During removal of catheter or packing
Y61.8	During other surgical and medical care
Y61.9	During unspecified surgical and medical care
Y62	Failure of sterile precautions during surgical and medical care
Y62.0	During surgical operation
Y62.1	During infusion or transfusion
Y62.2	During kidney dialysis or other perfusion
Y62.3	During injection or immunization
Y62.4	During endoscopic examination
Y62.5	During heart catheterization
Y62.6	During aspiration, puncture and other catheterization
Y62.8	During other surgical and medical care
Y62.9	During unspecified surgical and medical care
Y63	Failure in dosage during surgical and medical care
Y63.0	Excessive amount of blood or other fluid given during transfusion or infusion
Y63.1	Incorrect dilution of fluid used during infusion
Y63.2	Overdose of radiation given during therapy
Y63.3	Inadvertent exposure of patient to radiation during medical care
Y63.4	Failure in dosage in electroshock or insulin-shock therapy
Y63.5	Inappropriate temperature in local application and packing
Y63.6	Nonadministration of necessary drug, medicament or biological substance
Y63.8	Failure in dosage during other surgical and medical care
Y63.9	Failure in dosage during unspecified surgical and medical care
Y64	Contaminated medical or biological substances
Y64.0	Contaminated medical or biological substance, transfused or infused
Y64.1	Contaminated medical or biological substance, injected or used for immunization
Y64.8	Contaminated medical or biological substance administered by other means
Y64.9	Contaminated medical or biological substance administered by unspecified means
Y65	Other misadventures during surgical and medical care
Y65.0	Mismatched blood used in transfusion
Y65.1	Wrong fluid used in infusion
Y65.2	Failure in suture or ligature during surgical operation
Y65.3	Endotracheal tube wrongly placed during anaesthetic procedure
Y65.4	Failure to introduce or to remove other tube or instrument
Y65.5	Performance of inappropriate operation
Y65.8	Other specified misadventures during surgical and medical care
Y66	Nonadministration of surgical and medical care
Y69	Unspecified misadventure during surgical and medical care

Medical devices associated with adverse incidents in diagnostic and therapeutic use (Y70-Y82)

Y70	Anaesthesiology devices associated with adverse incidents
Y70.0	Anaesthesiology devices associated with adverse incidents, diagnostic and monitoring devices
Y70.1	Anaesthesiology devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices

Y70.2	Anaesthesiology devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y70.3	Anaesthesiology devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y70.8	Anaesthesiology devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y71	Cardiovascular devices associated with adverse incidents
Y71.0	Cardiovascular devices associated with adverse incidents, diagnostic and monitoring devices
Y71.1	Cardiovascular devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y71.2	Cardiovascular devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y71.3	Cardiovascular devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y71.8	Cardiovascular devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y72	Otorhinolaryngological devices associated with adverse incidents
Y72.0	Otorhinolaryngological devices associated with adverse incidents, diagnostic and monitoring devices
Y72.1	Otorhinolaryngological devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y72.2	Otorhinolaryngological devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y72.3	Otorhinolaryngological devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y72.8	Otorhinolaryngological devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y73	Gastroenterology and urology devices associated with adverse incidents
Y73.0	Gastroenterology and urology devices associated with adverse incidents, diagnostic and monitoring devices
Y73.1	Gastroenterology and urology devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y73.2	Gastroenterology and urology devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y73.3	Gastroenterology and urology devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y73.8	Gastroenterology and urology devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y74	General hospital and personal-use devices associated with adverse incidents
Y74.0	General hospital and personal-use devices associated with adverse incidents, diagnostic and monitoring devices
Y74.1	General hospital and personal-use devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y74.2	General hospital and personal-use devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y74.3	General hospital and personal-use devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y74.8	General hospital and personal-use devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y75	Neurological devices associated with adverse incidents
Y75.0	Neurological devices associated with adverse incidents, diagnostic and monitoring devices
Y75.1	Neurological devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices

- Y75.2 Neurological devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
- Y75.3 Neurological devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
- Y75.8 Neurological devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
- Y76 Obstetric and gynaecological devices associated with adverse incidents
- Y76.0 Obstetric and gynaecological devices associated with adverse incidents, diagnostic and monitoring devices
- Y76.1 Obstetric and gynaecological devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
- Y76.2 Obstetric and gynaecological devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
- Y76.3 Obstetric and gynaecological devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
- Y76.8 Obstetric and gynaecological devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
- Y77 Ophthalmic devices associated with adverse incidents
- Y77.0 Ophthalmic devices associated with adverse incidents, diagnostic and monitoring devices
- Y77.1 Ophthalmic devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
- Y77.2 Ophthalmic devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
- Y77.3 Ophthalmic devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
- Y77.8 Ophthalmic devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
- Y78 Radiological devices associated with adverse incidents
- Y78.0 Radiological devices associated with adverse incidents, diagnostic and monitoring devices
- Y78.1 Radiological devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
- Y78.2 Radiological devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
- Y78.3 Radiological devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
- Y78.8 Radiological devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
- Y79 Orthopaedic devices associated with adverse incidents
- Y79.0 Orthopaedic devices associated with adverse incidents, diagnostic and monitoring devices
- Y79.1 Orthopaedic devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
- Y79.2 Orthopaedic devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
- Y79.3 Orthopaedic devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
- Y79.8 Orthopaedic devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
- Y80 Physical medicine devices associated with adverse incidents
- Y80.0 Physical medicine devices associated with adverse incidents, diagnostic and monitoring devices
- Y80.1 Physical medicine devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices

Y80.2	Physical medicine devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y80.3	Physical medicine devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y80.8	Physical medicine devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y81	General- and plastic-surgery devices associated with adverse incidents
Y81.0	General- and plastic-surgery devices associated with adverse incidents, diagnostic and monitoring devices
Y81.1	General- and plastic-surgery devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y81.2	General- and plastic-surgery devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y81.3	General- and plastic-surgery devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y81.8	General- and plastic-surgery devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y82	Other and unspecified medical devices associated with adverse incidents
Y82.0	Other and unspecified medical devices associated with adverse incidents, diagnostic and monitoring devices
Y82.1	Other and unspecified medical devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y82.2	Other and unspecified medical devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y82.3	Other and unspecified medical devices associated with adverse incidents, surgical instruments, materials and devices (including sutures)
Y82.8	Other and unspecified medical devices associated with adverse incidents, miscellaneous devices, not elsewhere classified

Surgical and other medical procedures as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure (Y83-Y84)

Y83	Surgical operation and other surgical procedures as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure
Y83.0	Surgical operation with transplant of whole organ
Y83.1	Surgical operation with implant of artificial internal device
Y83.2	Surgical operation with anastomosis, bypass or graft
Y83.3	Surgical operation with formation of external stoma
Y83.4	Other reconstructive surgery
Y83.5	Amputation of limb(s)
Y83.6	Removal of other organ (partial) (total)
Y83.8	Other surgical procedures
Y83.9	Surgical procedure, unspecified
Y84	Other medical procedures as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure
Y84.0	Cardiac catheterization
Y84.1	Kidney dialysis
Y84.2	Radiological procedure and radiotherapy
Y84.3	Shock therapy
Y84.4	Aspiration of fluid
Y84.5	Insertion of gastric or duodenal sound
Y84.6	Urinary catheterization
Y84.7	Blood-sampling
Y84.8	Other medical procedures
Y84.9	Medical procedure, unspecified

Sequelae of external causes of morbidity and mortality (Y88)

- Y88 Sequelae with surgical and medical care as external cause
- Y88.0 Sequelae of adverse effects caused by drugs, medicaments and biological substances in therapeutic use
- Y88.1 Sequelae of misadventures to patients during surgical and medical procedures
- Y88.2 Sequelae of adverse incidents associated with medical devices in diagnostic and therapeutic use
- Y88.3 Sequelae of surgical and medical procedures as the cause of abnormal reaction of the patient, or of later complication, without mention of misadventure at the time of the procedure

Appendix II. Principal diagnoses for hospital discharges associated with complications resulting from medical treatment or procedures

ICD-9-CM code	Diagnosis
251.3	Postsurgical hypoinsulinemia
323.5	Encephalitis following immunization procedures
349.0	Reaction to spinal or lumbar puncture
349.1	Nervous system complications from surgically implanted device
429.4	Functional disturbances following cardiac surgery
457.0	Postmastectomy lymphedema syndrome
512.1	Iatrogenic pneumothorax
519.0	Tracheostomy complication
564.2	Postgastric surgery syndromes
564.3	Vomiting following gastrointestinal surgery
564.4	Other postoperative functional disorders
569.6	Colostomy and enterostomy malfunction
569.60	Unspecified colostomy and enterostomy complication
569.61	Infection of colostomy or enterostomy
569.69	Other complication of colostomy or enterostomy
576.0	Postcholecystectomy syndrome
579.3	Other and unspecified postsurgical nonabsorption
635.00 - .02	Legally induced abortion complicated by genital tract and pelvic infection
635.10 - .12	Legally induced abortion complicated by delayed or excessive hemorrhage
635.20 - .22	Legally induced abortion complicated by damage to pelvic organs or tissues
635.30 - .32	Legally induced abortion complicated by renal failure
635.40 - .42	Legally induced abortion complicated by metabolic disorder
635.50 - .52	Legally induced abortion complicated by shock
635.60 - .62	Legally induced abortion complicated by embolism
635.70 - .72	Legally induced abortion with other specified complications
635.80 - .82	Legally induced abortion with unspecified complications
637.00 - .02	Unspecified abortion complicated by genital tract and pelvic infection
637.10 - .12	Unspecified abortion complicated by delayed or excessive hemorrhage
637.20 - .22	Unspecified abortion complicated by damage to pelvic organs or tissues
637.30 - .32	Unspecified abortion complicated by renal failure
637.40 - .42	Unspecified abortion complicated by metabolic disorder
637.50 - .52	Unspecified abortion complicated by shock
637.60 - .62	Unspecified abortion complicated by embolism
637.70 - .72	Unspecified abortion with other specified complications
637.80 - .82	Unspecified abortion with unspecified complications
638.0	Failed attempted abortion complicated by genital tract and pelvic infection
638.1	Failed attempted abortion complicated by delayed or excessive hemorrhage
638.2	Failed attempted abortion complicated by damage to pelvic organs or tissues
638.3	Failed attempted abortion complicated by renal failure
638.4	Failed attempted abortion complicated by metabolic disorder
638.5	Failed attempted abortion complicated by shock
638.6	Failed attempted abortion complicated by embolism
638.7	Failed attempted abortion with other specified complications
638.8	Failed attempted abortion with unspecified complications
659.30 - .33	Septicemia during labor
668.00 - .04	Pulmonary complications of anesthesia or sedation in labor and delivery
668.10 - .14	Cardiac complications of anesthesia or sedation in labor and delivery
668.20 - .24	Central nervous system complications of anesthesia or sedation in labor and delivery
668.80 - .84	Other complications of anesthesia or sedation in labor and delivery
668.90 - .94	Unspecified complications of anesthesia or sedation in labor and delivery

669.10 - .14	Obstetric shock
670.02 - .04	Major puerperal infection
673.00 - .04	Obstetrical air embolism
674.00 - .04	Cerebrovascular complications in the puerperium
674.10 - .14	Disruption of cesarean wound
674.20 - .24	Disruption of perineal wound
674.30 - .34	Other complications of obstetrical surgical wounds
763.5	Maternal anesthesia and analgesia affecting fetus or newborn
909.3	Late effect of complications of surgical or medical care
958.3	Posttraumatic wound infection not elsewhere classified
995.4	Shock due to anesthesia
995.89	Other specified adverse effects not elsewhere classified
996.00 - .09	Mechanical complication of cardiac device, implant, and graft
996.1	Mechanical complication of other vascular device, implant, and graft
996.2	Mechanical complication of nervous system device, implant, and graft
996.30 - .39	Mechanical complication of genitourinary device, implant, and graft
996.4	Mechanical complication of internal orthopedic device, implant, and graft
996.51 - .59	Mechanical complication of other specified device, implant, and graft
996.60 - .69	Infection and inflammatory reaction due to internal prosthetic device, implant, and graft
996.70 - .79	Other complications of internal prosthetic device, implant, and graft
996.80 - .89	Complications of transplanted organ
996.90 - .99	Complications of reattached extremity or body part
997.0 - .03	Complications affecting specified body systems not elsewhere classified
997.1	Cardiac complications not elsewhere classified
997.2	Peripheral vascular complications not elsewhere classified
997.3	Respiratory complications not elsewhere classified
997.4	Gastrointestinal complications not elsewhere classified
997.5	Urinary complications not elsewhere classified
997.60 - .69	Late amputation stump complications
997.9 - .99	Complications affecting other specified body systems
998.0	Postoperative shock
998.1	Hemorrhage or hematoma complicating a procedure
998.2	Accidental puncture or laceration during a procedure
998.3	Disruption of operative wound
998.4	Foreign body accidentally left during a procedure
998.5	Postoperative infection
998.6	Persistent postoperative fistula
998.7	Acute reaction to foreign substance accidentally left during a procedure
998.8 - .89	Other specified complications of procedures
998.9	Unspecified complications of procedures
999.0	Generalized vaccinia
999.1	Air embolism complicating medical care
999.2	Other vascular complication of medical care
999.3	Other infection due to medical care
999.4	Anaphylactic shock due to serum
999.5	Other serum reaction
999.6	ABO incompatibility reaction
999.7	Rh incompatibility reaction
999.8	Transfusion reaction not elsewhere classified
999.9	Other and unspecified complications of medical care

Figure 1
Death Rates for Medical and Surgical Complications
California, 2000-2002

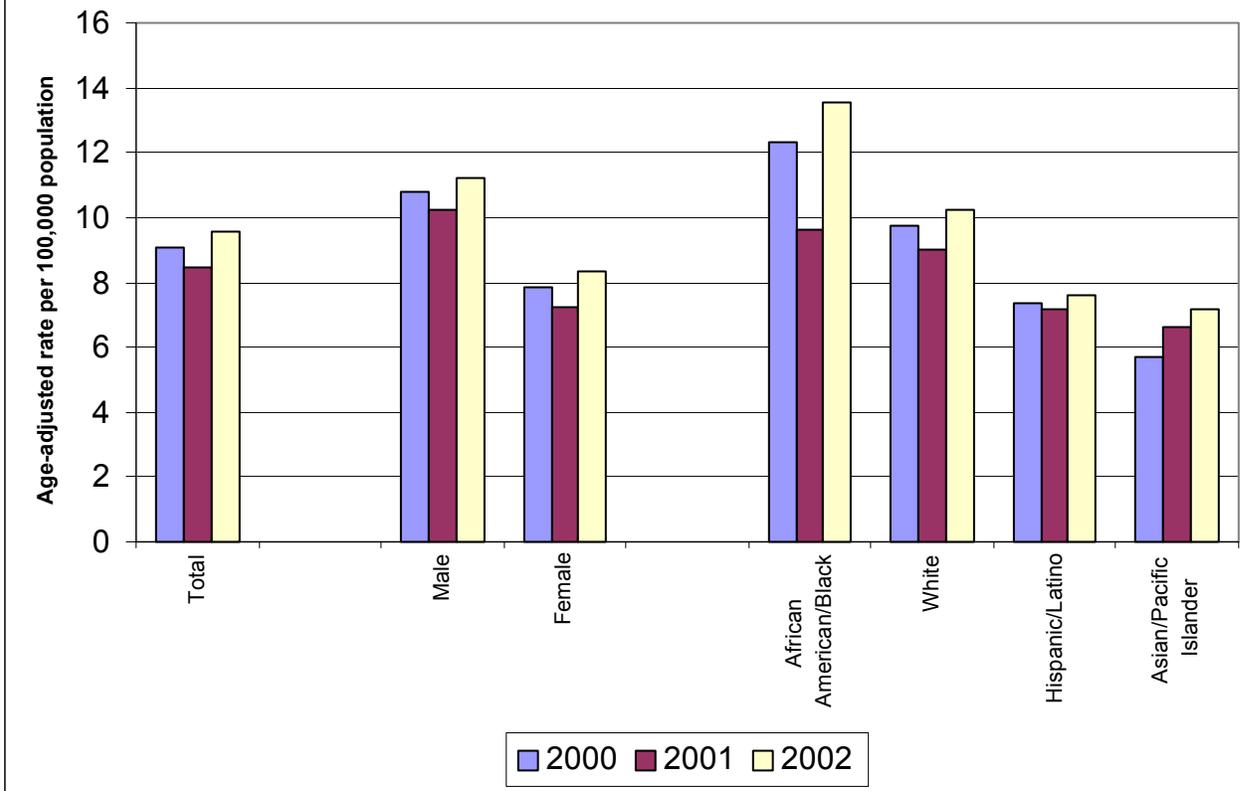


Figure 2
Hospital Discharge Rates for Medical and Surgical Complications
California, 2000-2002

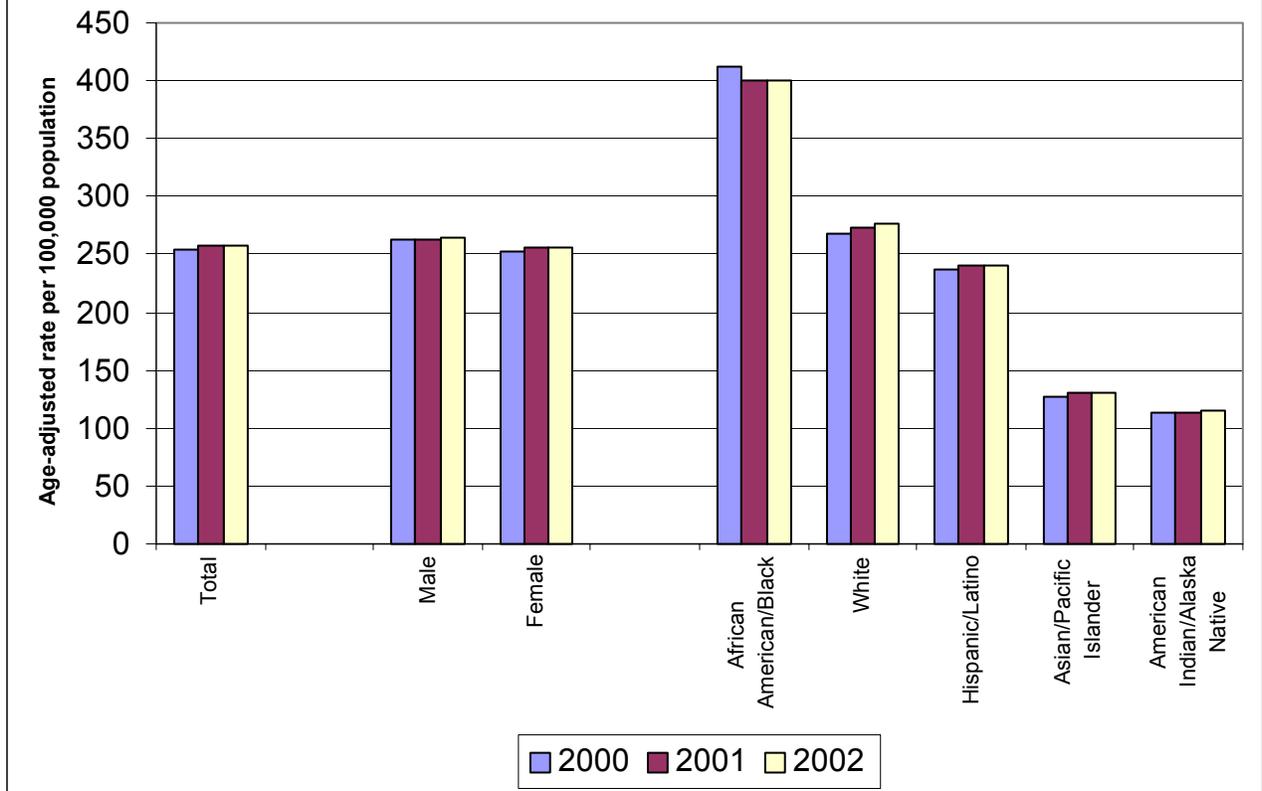


Table 1
Deaths and Mortality Rates Associated With Complications of Medical and Surgical Care
California, 2000-2002

	2000		Lower	Upper	2001		Lower	Upper	2002		Lower	Upper
	N	Rate ¹	95% C.I.	95% C.I.	N	Rate ¹	95% C.I.	95% C.I.	N	Rate ¹	95% C.I.	95% C.I.
CALIFORNIA TOTAL	2,700	9.1	8.7	9.4	2,628	8.5	8.2	8.8	3,070	9.5	9.2	9.9
Race/Ethnicity												
African American/Black	211	12.3	10.6	14.0	172	9.7	8.2	11.1	250	13.5	11.8	15.3
American Indian/Alaska Native	18	DSU	-----	-----	15	DSU	-----	-----	19	DSU	-----	-----
Asian/Pacific Islander	167	5.7	4.8	6.6	218	6.6	5.7	7.5	250	7.2	6.3	8.1
Hispanic/Latino	373	7.4	6.6	8.2	392	7.2	6.4	8.0	438	7.6	6.8	8.4
White	1,929	9.7	9.3	10.2	1,829	9.0	8.6	9.4	2,113	10.2	9.8	10.7
Gender												
Female	1,321	7.8	7.4	8.2	1,266	7.2	6.8	7.6	1,505	8.3	7.9	8.8
Male	1,379	10.8	10.2	11.3	1,362	10.2	9.7	10.8	1,565	11.2	10.7	11.8

SOURCES: CA Department of Health Services, Multiple Cause of Death Files 2000-2002; CA Department of Finance, Demographic Research Unit, Population Projections by Race/Ethnicity for California and Its Counties 2000-2050, May 2004.

NOTES: Deaths due to complications of medical and surgical care defined by ICD-10 codes Y40-Y84, Y88 as an underlying or contributing cause of death; death records indicating "Other" and "Unknown" race/ethnicity are excluded in race/ethnicity tabulations.

¹ Rate per 100,000 population, age-adjusted using the 2000 US population standard; excludes records with unknown ages.

DSU Data statistically unreliable due to small number of events.

Table 2
Hospitalizations and Morbidity Rates Associated With Complications of Medical and Surgical Care
California, 2000-2002

	2000		Lower	Upper	2001		Lower	Upper	2002		Lower	Upper
	N	Rate ¹	95% C.I.	95% C.I.	N	Rate ¹	95% C.I.	95% C.I.	N	Rate ¹	95% C.I.	95% C.I.
CALIFORNIA TOTAL	79,405	254.3	252.5	256.0	82,800	257.3	255.6	259.1	85,380	257.4	255.6	259.1
Race/Ethnicity												
African American/Black	7,766	412.8	403.4	422.2	7,797	399.8	390.8	408.9	8,130	399.8	390.9	408.6
American Indian/Alaska Native	198	112.7	96.5	129.0	218	113.5	97.5	129.4	247	114.4	99.5	129.3
Asian/Pacific Islander	4,221	127.3	123.3	131.2	4,606	129.7	125.9	133.5	4,840	129.9	126.2	133.6
Hispanic/Latino	15,567	236.2	232.0	240.5	16,663	240.0	235.9	244.1	17,583	239.8	235.8	243.8
White	49,210	267.2	264.9	269.6	50,995	273.5	271.1	275.9	52,252	277.1	274.7	279.5
Gender												
Female	42,058	252.1	249.7	254.5	43,862	256.1	253.6	258.4	44,905	255.6	253.2	257.9
Male	37,347	262.1	259.4	264.8	38,933	263.6	261.0	266.3	40,470	264.4	261.8	267.0

SOURCES: CA Office of Statewide Health Planning and Development, Patient Discharge Data files 2000-2002; CA Department of Finance, Demographic Research Unit, Population Projections by Race/Ethnicity for California and Its Counties 2000-2050, May 2004.

NOTES: Hospitalizations with complications of medical and surgical care as a principal diagnosis as defined by ICD-9-CM code set published in: Elixhauser, A., Johantgen, M., and Andrews, R. *Descriptive statistics by insurance status for most frequent hospital diagnoses and procedures*.

Rockville, MD: Agency for Health Care Policy Research, Publication No. 97-0009, HCUP-3, Research Note 5, 1997.

¹ Rate per 100,000 population, age-adjusted using the 2000 US Standard Population.

Table 1-A. Underlying Causes of Death
 Medical & Surgical Complications
 California, 2000-2002

ICD-10	TOTAL	Code description
Y838	65	Other surgical procedures as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y848	57	Other medical procedures as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y831	45	Surgical operation with implant of artificial internal device as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y839	42	Surgical procedure, unspecified, as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y836	40	Removal of other organ as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y833	32	Surgical operation w/ formation of external stoma as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y834	31	Other reconstructive surgery as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y832	22	Surgical operation with anastomosis, bypass or graft as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y883	21	Sequelae of surgical and medical procedures as the cause of abnormal reaction of the patient, or of later complication, w/o mention of misadventure
Y835	16	Amputation of limb(s) as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y846	16	Urinary catheterization as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y600	14	Misadventures to patients during surgical and medical care, During surgical operation
Y579	12	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Drug or medicament, unspecified
Y604	9	Misadventures to patients during surgical and medical care, During endoscopic examination
Y608	9	Misadventures to patients during surgical and medical care, During other surgical and medical care
Y830	8	Surgical operation w/ transplant of whole organ as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y658	6	Misadventures to patients during surgical and medical care, Other specified misadventures during surgical and medical care
Y841	6	Kidney dialysis as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y606	5	Misadventures to patients during surgical and medical care, During aspiration, puncture and other catheterization
Y840	5	Cardiac catheterization as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y484	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Anaesthetic, unspecified
Y609	4	Misadventures to patients during surgical and medical care, During unspecified surgical and medical care
Y844	4	Aspiration of fluid as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y880	4	Sequelae of adverse effects caused by drugs, medicaments and biological substances in therapeutic use
Y400	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Penicillins
Y442	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Anticoagulants
Y849	3	Medical procedure, unspecified, as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y409	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Systemic antibiotic, unspecified
Y411	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antimycobacterial drugs
Y434	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Immunosuppressive agents
Y548	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Agents affecting uric acid metabolism
Y578	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other drugs and medicaments

Table 1-A. Underlying Causes of Death, continued
 Medical & Surgical Complications
 California, 2000-2002

ICD-10	TOTAL	Code description
Y401	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Cefalosporins and other β lactam antibiotics
Y408	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other systemic antibiotics
Y418	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other specified systemic anti infectives and antiparasitics
Y423	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Insulin and oral hypoglycaemic [antidiabetic] drugs
Y431	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antineoplastic antimetabolites
Y433	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other antineoplastic drugs
Y453	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other nonsteroidal anti inflammatory drugs [NSAID]
Y455	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, 4 Aminophenol derivatives
Y462	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Hydantoin derivatives
Y479	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Sedative, hypnotic and antianxiety drug, unspecified
Y481	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Parenteral anaesthetics
Y493	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Phenothiazine antipsychotics and neuroleptics
Y520	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Cardiac stimulant glycosides and drugs of similar action
Y522	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other antidysrhythmic drugs, not elsewhere classified
Y523	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Coronary vasodilators, not elsewhere classified
Y530	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Histamine H2 receptor antagonists
Y557	1	Other and unspecified agents primarily acting on the respiratory system causing adverse effects in therapeutic use
Y610	1	Misadventures to patients during surgical and medical care, During surgical operation
Y632	1	Misadventures to patients during surgical and medical care, Overdose of radiation given during therapy
Y636	1	Misadventures to patients during surgical and medical care, Nonadministration of necessary drug, medicament or biological substance
Y650	1	Misadventures to patients during surgical and medical care, Mismatched blood used in transfusion
Y653	1	Misadventures to patients during surgical and medical care, Endotracheal tube wrongly placed during anaesthetic procedure
Y732	1	Gastroenterology and urology devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y750	1	Neurological devices associated with adverse incidents, diagnostic and monitoring devices
Y818	1	General- and plastic-surgery devices associated with adverse incidents, miscellaneous devices, not elsewhere classified
Y821	1	Other and unspecified medical devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y843	1	Shock therapy as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Subtotal	523	

Table 1-B. Contributing Causes of Death
 Medical & Surgical Complications
 California, 2000-2002

ICD-10	TOTAL	Code description
Y832	1,089	Surgical operation with anastomosis, bypass or graft as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y836	912	Removal of other organ as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y831	657	Surgical operation with implant of artificial internal device as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y848	568	Other medical procedures as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y838	520	Other surgical procedures as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y442	412	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Anticoagulants
Y834	412	Other reconstructive surgery as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y433	411	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other antineoplastic drugs
Y842	363	Radiological procedure and radiotherapy as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y839	335	Surgical procedure, unspecified, as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y883	317	Sequelae of surgical and medical procedures as the cause of abnormal reaction of the patient, or of later complication, w/o mention of misadventure
Y434	237	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Immunosuppressive agents
Y830	222	Surgical operation w/ transplant of whole organ as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y835	192	Amputation of limb(s) as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y841	180	Kidney dialysis as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y833	165	Surgical operation w/ formation of external stoma as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y846	139	Urinary catheterization as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y427	101	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Androgens and anabolic congeners
Y600	84	Misadventures to patients during surgical and medical care, During surgical operation
Y579	82	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Drug or medicament, unspecified
Y445	58	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Thrombolytic drugs
Y608	42	Misadventures to patients during surgical and medical care, During other surgical and medical care
Y409	39	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Systemic antibiotic, unspecified
Y606	26	Misadventures to patients during surgical and medical care, During aspiration, puncture and other catheterization
Y840	25	Cardiac catheterization as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y604	21	Misadventures to patients during surgical and medical care, During endoscopic examination
Y560	20	Local antifungal, anti infective and anti inflammatory drugs, NEC, causing adverse effects in therapeutic use
Y431	19	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antineoplastic antimetabolites
Y658	19	Misadventures to patients during surgical and medical care, Other specified misadventures during surgical and medical care
Y880	19	Sequelae of adverse effects caused by drugs, medicaments and biological substances in therapeutic use
Y450	17	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Opioids and related analgesics
Y640	16	Misadventures to patients during surgical and medical care, Contaminated medical or biological substance, transfused or infused

Table 1-B. Contributing Causes of Death, continued
 Medical & Surgical Complications
 California, 2000-2002

ICD-10	TOTAL	Code description
Y484	15	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Anaesthetic, unspecified
Y420	14	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Glucocorticoids and synthetic analogues
Y522	14	Other antidysrhythmic drugs, NEC, causing adverse effects in therapeutic use
Y605	14	Misadventures to patients during heart catheterization
Y443	13	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Anticoagulant antagonists, vitamin K and other coagulants
Y451	11	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Salicylates
Y849	11	Medical procedure, unspecified, as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y423	10	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Insulin and oral hypoglycaemic [antidiabetic] drugs
Y578	10	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other drugs and medicaments
Y844	10	Aspiration of fluid as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y881	10	Sequelae of misadventures to patients during surgical and medical procedures
Y453	9	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other nonsteroidal anti inflammatory drugs [NSAID]
Y415	8	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antiviral drugs
Y422	8	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antithyroid drugs
Y497	8	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Psychostimulants with abuse potential
Y545	7	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other diuretics
Y548	6	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Agents affecting uric acid metabolism
Y401	5	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Cephalosporins and other β lactam antibiotics
Y411	5	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antimycobacterial drugs
Y482	5	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other and unspecified general anaesthetics
Y576	5	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other diagnostic agents
Y408	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other systemic antibiotics
Y430	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antiallergic and antiemetic drugs
Y483	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Local anaesthetics
Y495	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other antipsychotics and neuroleptics
Y525	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other antihypertensive drugs, not elsewhere classified
Y575	4	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, X ray contrast media
Y602	4	Misadventures to patients during surgical and medical care, During kidney dialysis or other perfusion
Y607	4	Misadventures to patients during surgical and medical care, During administration of enema
Y609	4	Misadventures to patients during surgical and medical care, During unspecified surgical and medical care
Y400	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Penicillins
Y407	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antifungal antibiotics, systemically used

Table 1-B. Contributing Causes of Death, continued
 Medical & Surgical Complications
 California, 2000-2002

ICD-10	TOTAL	Code description
Y462	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Hydantoin derivatives
Y471	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Benzodiazepines
Y490	3	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Tricyclic and tetracyclic antidepressants
Y452	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Propionic acid derivatives
Y465	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Valproic acid
Y492	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other and unspecified antidepressants
Y509	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Central nervous system stimulant, unspecified
Y520	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Cardiac stimulant glycosides and drugs of similar action
Y556	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antiasthmatics, not elsewhere classified
Y593	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Immunoglobulin
Y599	2	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Vaccine or biological substance, unspecified
Y610	2	Misadventures to patients during surgical and medical care, During surgical operation
Y751	2	Neurological devices associated with adverse incidents, therapeutic (nonsurgical) and rehabilitative devices
Y403	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Macrolides
Y406	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Rifamycins
Y418	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other specified systemic anti-infectives and antiparasitics
Y421	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Thyroid hormones and substitutes
Y440	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Iron preparations and other anti-hypochromic anaemia preparations
Y441	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use,
Y446	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Natural blood and blood products
Y449	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other and unspecified agents affecting blood constituents
Y454	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antirheumatics
Y455	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, 4-Aminophenol derivatives
Y458	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other analgesics and antipyretics
Y472	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Cloral derivatives
Y493	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Phenothiazine antipsychotics and neuroleptics
Y494	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Butyrophenone and thioxanthene neuroleptics
Y517	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, β -Adrenoreceptor antagonists, not elsewhere classified
Y519	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other and unspecified drugs primarily affecting the autonomic nervous system
Y524	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Angiotensin converting enzyme inhibitors
Y526	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Antihyperlipidaemic and antiarteriosclerotic drugs
Y534	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other laxatives

Table 1-B. Contributing Causes of Death, continued
 Medical & Surgical Complications
 California, 2000-2002

ICD-10	TOTAL	Code description
Y549	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Mineral salts, not elsewhere classified
Y551	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Skeletal muscle relaxants [neuromuscular blocking agents]
Y574	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Pharmaceutical excipients
Y598	1	Drugs, medicaments and biological substances causing adverse effects in therapeutic use, Other specified vaccines and biological substances
Y601	1	Misadventures to patients during surgical and medical care, During infusion or transfusion
Y603	1	Misadventures to patients during surgical and medical care, During injection or immunization
Y618	1	Misadventures to patients during surgical and medical care, During other surgical and medical care
Y619	1	Misadventures to patients during surgical and medical care, During unspecified surgical and medical care
Y629	1	Misadventures to patients during surgical and medical care, During unspecified surgical and medical care
Y633	1	Misadventures to patients during surgical and medical care, Inadvertent exposure of patient to radiation during medical care
Y651	1	Misadventures to patients during surgical and medical care, Wrong fluid used in infusion
Y750	1	Neurological devices associated with adverse incidents, diagnostic and monitoring devices
Y812	1	General- and plastic-surgery devices associated with adverse incidents, prosthetic and other implants, materials and accessory devices
Y843	1	Shock therapy as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y845	1	Insertion of gastric or duodenal sound as the cause of abnormal reaction of the patient or of later complication, w/o mention of misadventure
Y882	1	Sequelae of adverse incidents associated with medical devices in diagnostic and therapeutic use
Subtotal	8,023	

Table 2-A. Hospital Discharges
 Complications of Medical and Surgical Care
 California, 2000-2002

Principal Diagnosis	Total Discharges	Total Charges	Code description
99859	33,710	\$1,230,003,730	Other postoperative infection
9964	28,806	1,156,617,357	Mechanical complication of internal orthopedic device, implant, and graft
99673	20,582	597,560,051	Other complications due to renal dialysis device, implant, and graft
99662	20,553	951,798,903	Infection and inflammatory reaction due to vascular device, implant, and graft
9974	13,028	417,142,801	Gastrointestinal complications not elsewhere classified
99674	10,134	479,200,653	Other complications due to other vascular device, implant, and graft
9962	5,399	172,064,931	Mechanical complication of nervous system device, implant, and graft
99681	5,361	180,840,777	Complications of transplanted kidney
99666	5,177	315,313,791	Infection and inflammatory reaction due to internal joint prosthesis
99672	4,650	220,464,888	Other complications due to cardiac device, implant, and graft
99678	4,503	119,453,662	Other complications due to other internal orthopedic device, implant, and graft
99762	4,040	173,586,014	Amputation stump infection (chronic)
99667	3,956	185,339,363	Infection and inflammatory reaction due to other internal orthopedic device, implant, and graft
99601	3,950	100,495,747	Mechanical complication due to cardiac pacemaker
9983	3,879	139,154,404	Disruption of operative wound
99889	3,486	58,919,637	Other specified complications of procedures
9961	3,340	94,285,167	Mechanical complication of other vascular device, implant, and graft
9975	3,186	66,209,896	Urinary complications not elsewhere classified
99669	3,149	107,886,374	Infection and inflammatory reaction due to other internal prosthetic device, implant, and graft
99664	3,082	64,225,442	Infection and inflammatory reaction due to indwelling urinary catheter
9971	3,013	93,140,619	Cardiac complications not elsewhere classified
99677	3,005	110,288,659	Other complications due to internal joint prosthesis
9973	2,615	71,339,754	Respiratory complications not elsewhere classified
56969	2,590	97,719,583	Other complication of colostomy or enterostomy
67004	2,538	30,728,775	Major puerperal infection, postpartum condition or complication
9982	2,431	118,931,212	Accidental puncture or laceration during a procedure
5121	2,292	51,662,512	Iatrogenic pneumothorax
9986	2,264	137,361,774	Persistent postoperative fistula
99668	2,229	100,688,895	Infection and inflammatory reaction due to peritoneal dialysis catheter
99661	2,222	152,521,110	Infection and inflammatory reaction due to cardiac device, implant, and graft
99769	2,031	59,762,464	Other amputation stump complication
99659	2,013	55,814,647	Mechanical complication due to other implant and internal device, NEC

Table 2-A. Hospital Discharges, continued
 Complications of Medical and Surgical Care
 California, 2000-2002

Principal Diagnosis	Total Discharges	Total Charges	Code description
9972	1,976	49,122,075	Peripheral vascular complications not elsewhere classified
99682	1,902	141,193,107	Complications of transplanted liver
99883	1,898	71,705,771	Non-healing surgical wound
99639	1,518	36,872,457	Mechanical complication due to other genitourinary device, implant, and graft
99604	1,507	62,659,588	Mechanical complication due to automatic implantable cardiac defibrillator
99679	1,470	36,603,788	Other complications due to other internal prosthetic device, implant, and graft
99663	1,461	118,536,160	Infection and inflammatory reaction due to nervous system device, implant, and graft
67434	1,178	15,567,075	Other complications of obstetrical surgical wounds
99665	1,121	31,756,280	Infection and inflammatory reaction due to genitourinary device, implant, and graft
99676	1,112	22,244,767	Other complications due to genitourinary device, implant, and graft
9993	1,099	32,372,256	Other infection due to medical care
3490	995	10,113,522	Reaction to spinal or lumbar puncture
4294	990	28,580,787	Functional disturbances following cardiac surgery
99602	921	129,109,121	Mechanical complication due to heart valve prosthesis
99799	732	18,347,197	Other complications affecting other specified body systems, NEC
99702	671	27,477,090	Iatrogenic cerebrovascular infarction or hemorrhage
99683	664	67,554,983	Complications of transplanted heart
99654	644	11,961,360	Mechanical complication due to breast prosthesis
99685	593	84,212,095	Complications of transplanted bone marrow
5793	585	32,078,636	Other and unspecified postsurgical nonabsorption
99671	580	71,902,481	Other complications due to heart valve prosthesis
99675	569	17,234,869	Other complications due to nervous system device, implant, and graft
9583	568	16,756,093	Posttraumatic wound infection not elsewhere classified
99652	539	24,556,776	Mechanical complication due to graft of other tissue, not elsewhere classified
56961	515	20,582,470	Infection of colostomy or enterostomy
99656	512	15,373,305	Mechanical complication due to peritoneal dialysis catheter
5643	455	6,537,137	Vomiting following gastrointestinal surgery
99684	417	59,947,306	Complications of transplanted lung
99631	368	5,250,174	Mechanical complication due to urethral [indwelling] catheter
99609	328	17,142,009	Mechanical complication due to other device, implant, or graft
9992	316	6,598,978	Other vascular complication of medical care
9998	302	4,469,400	Rh incompatibility reaction

Table 2-A. Hospital Discharges, continued
 Complications of Medical and Surgical Care
 California, 2000-2002

Principal Diagnosis	Total Discharges	Total Charges	Code description
63511	284	2,617,268	Legally induced abortion complicated by delayed or excessive hemorrhage, incomplete
67002	267	4,198,795	Major puerperal infection, delivered with mention of postpartum complication
5642	240	7,632,134	Postgastric surgery syndromes
63572	234	2,345,813	Legally induced abortion with other specified complications, complete
99686	217	14,344,663	Complications of transplanted pancreas
9984	215	5,052,620	Foreign body accidentally left during a procedure
9999	193	3,786,000	Other and unspecified complications of medical care
65931	189	2,207,174	Septicemia during labor
99701	179	9,415,316	Central nervous system complication
66881	171	1,509,308	Other complications of anesthesia or sedation in labor and delivery, delivered w/ or w/o mention of antepartum complications
63512	159	887,488	Legally induced abortion complicated by delayed or excessive hemorrhage, complete
66882	158	1,470,308	Other complications of anesthesia or sedation in labor and delivery, delivered with mention of postpartum complication
63582	154	291,005	Legally induced abortion with unspecified complications, complete
9995	147	1,669,774	Other serum reaction
63502	142	850,388	Legally induced abortion complicated by genital tract and pelvic infection, complete
63501	139	1,588,992	Legally induced abortion complicated by genital tract and pelvic infection, incomplete
67414	133	2,027,596	Disruption of cesarean wound, postpartum condition or complication
63571	130	1,732,557	Legally induced abortion with other specified complications, incomplete
99791	126	1,824,796	Hypertension
67432	122	1,316,562	Other complications of obstetrical surgical wounds
66884	117	820,514	Other complications of anesthesia or sedation in labor and delivery, postpartum condition or complication
5760	114	1,525,833	Postcholecystectomy syndrome
99881	108	2,630,896	Emphysema (subcutaneous) (surgical) resulting from a procedure
63711	98	1,220,258	Unspecified abortion complicated by delayed or excessive hemorrhage, incomplete
99603	96	4,049,031	Mechanical complication due to coronary bypass graft
67404	89	5,523,433	Cerebrovascular complications in the puerperium, postpartum condition or complication
5644	88	2,696,597	Other postoperative functional disorders
67424	84	999,204	Disruption of perineal wound, postpartum condition or complication
99653	67	939,235	Mechanical complication due to ocular lens prosthesis
9980	67	4,021,769	Postoperative shock
99761	61	926,584	Neuroma of amputation stump
67403	59	1,226,534	Cerebrovascular complications in the puerperium, antepartum condition or complication

Table 2-A. Hospital Discharges, continued
 Complications of Medical and Surgical Care
 California, 2000-2002

Principal Diagnosis	Total Discharges	Total Charges	Code description
99760	58	1,337,686	Amputation stump complication, unspecified
99632	55	1,109,752	Mechanical complication due to intrauterine contraceptive device
67401	54	3,197,312	Cerebrovascular complications in the puerperium, delivered w/ or w/o mention of antepartum complications
9989	53	879,873	Unspecified complications of procedure, not elsewhere classified
56960	52	1,667,011	Unspecified colostomy and enterostomy complication
99882	49	725,944	Cataract fragments in eye following cataract surgery
99651	46	867,435	Mechanical complication due to corneal graft
99660	46	1,584,347	Infection and inflammatory reaction due to unspecified device, implant, and graft
63701	45	463,270	Unspecified abortion complicated by genital tract and pelvic infection, incomplete
99693	44	1,141,746	Complications of reattached finger(s)
63522	40	867,921	Legally induced abortion complicated by damage to pelvic organs or tissues, complete
99670	33	776,799	Other complications due to unspecified device, implant, and graft
4570	29	775,740	Postmastectomy lymphedema syndrome
63771	29	311,137	Unspecified abortion with other specified complications, incomplete
9994	28	466,421	Anaphylactic shock due to serum
2513	25	234,558	Postsurgical hypoinsulinemia
63521	25	696,033	Legally induced abortion complicated by damage to pelvic organs or tissues, incomplete
63702	24	256,834	Unspecified abortion complicated by genital tract and pelvic infection, complete
9987	24	985,922	Acute reaction to foreign substance accidentally left during a procedure
63712	22	354,744	Unspecified abortion complicated by delayed or excessive hemorrhage, complete
63570	21	239,198	Legally induced abortion with other specified complications, unspecified
99689	20	1,624,737	Complications of other specified transplanted organ
9954	19	422,793	Shock due to anesthesia
9093	18	602,161	Late effect of complications of surgical or medical care
63510	15	265,424	Legally induced abortion complicated by delayed or excessive hemorrhage, unspecified
99630	15	251,548	Mechanical complication of unspecified genitourinary device, implant, and graft
9991	14	354,736	Air embolism complicating medical care
3491	13	228,372	Nervous system complications from surgically implanted device
67412	13	137,127	Disruption of cesarean wound, delivered with mention of postpartum complication
99655	13	409,416	Mechanical complication due to artificial skin graft and decellularized allodermis
63500	12	106,640	Legally induced abortion complicated by genital tract and pelvic infection, unspecified
99687	12	912,466	Complications of transplanted intestine

Table 2-A. Hospital Discharges, continued
 Complications of Medical and Surgical Care
 California, 2000-2002

Principal Diagnosis	Total Discharges	Total Charges	Code description
6381	11	138,657	Failed attempted abortion complicated by delayed or excessive hemorrhage
99692	11	320,958	Complications of reattached hand
63581	10	99,700	Legally induced abortion with unspecified complications, incomplete
63781	10	82,085	Unspecified abortion with unspecified complications, incomplete
66801	10	228,654	Pulmonary complications of anesthesia or sedation in labor and delivery, delivered w/ or w/o mention of antepartum complications
66804	10	149,449	Pulmonary complications of anesthesia or sedation in labor and delivery, postpartum condition or complication
66811	9	95,029	Cardiac complications of anesthesia or sedation in labor and delivery, delivered w/ or w/o mention of antepartum complications
99589	9	160,875	Other specified adverse effects not elsewhere classified
3235	8	943,101	Encephalitis following immunization procedures
63542	7	114,075	Legally induced abortion complicated by metabolic disorder, complete
6380	7	115,205	Failed attempted abortion complicated by genital tract and pelvic infection
67422	7	49,742	Disruption of perineal wound, delivered with mention of postpartum complication
63772	6	38,022	Unspecified abortion with other specified complications, complete
6382	6	68,332	Failed attempted abortion complicated by damage to pelvic organs or tissues
6387	6	43,268	Failed attempted abortion with other specified complications
63532	5	100,351	Legally induced abortion complicated by renal failure, complete
63562	5	92,995	Legally induced abortion complicated by embolism, complete
63580	5	40,825	Legally induced abortion with unspecified complications, unspecified
66814	5	35,595	Cardiac complications following administration of anesthesia or other sedation in labor and delivery
66914	5	60,090	Obstetric shock during or following labor and delivery
99691	5	1,521,505	Complications of reattached forearm
9996	5	78,029	ABO incompatibility reaction
63520	4	47,150	Legally induced abortion complicated by damage to pelvic organs or tissues, unspecified
63700	4	58,266	Unspecified abortion complicated by genital tract and pelvic infection, unspecified
66812	4	53,483	Cardiac complications of anesthesia or sedation in labor and delivery, delivered with mention of postpartum complication
66824	4	47,523	Central nervous system complications of anesthesia or sedation in labor and delivery, postpartum condition or complication
66883	4	27,308	Other complications of anesthesia or sedation in labor and delivery, antepartum condition or complication
66891	4	36,801	Unspecified complications of anesthesia or sedation in labor and delivery, delivered w/ or w/o mention of antepartum complications
67303	4	51,107	Obstetrical air embolism
99680	4	218,411	Complications of transplanted organ, unspecified
99694	4	149,506	Complications of reattached upper extremity, other and unspecified
99695	4	64,451	Complications of reattached foot and toe(s)

Table 2-A. Hospital Discharges, continued
 Complications of Medical and Surgical Care
 California, 2000-2002

Principal Diagnosis	Total Discharges	Total Charges	Code description
9990	4	23,601	Generalized vaccinia
63710	3	13,451	Unspecified abortion complicated by delayed or excessive hemorrhage, unspecified
63721	3	60,741	Unspecified abortion complicated by damage to pelvic organs or tissues, incomplete
66813	3	24,394	Cardiac complications of anesthesia or sedation in labor and delivery, antepartum condition or complication
66894	3	9,718	Unspecified complications of anesthesia or sedation in labor and delivery, postpartum condition or complication
67430	3	96,683	Other complications of obstetrical surgical wounds, unspecified
63530	2	24,746	Legally induced abortion complicated by renal failure, unspecified
63540	2	71,664	Legally induced abortion complicated by metabolic disorder, unspecified
63722	2	22,456	Unspecified abortion complicated by damage to pelvic organs or tissues, complete
65933	2	24,250	Generalized infection during labor
66911	2	21,537	Shock during or following labor and delivery
99600	2	92,922	Mechanical complication of unspecified cardiac device, implant, and graft
63531	1	0	Legally induced abortion complicated by renal failure, incomplete
63550	1	11,137	Legally induced abortion complicated by shock, unspecified
63551	1	11,134	Legally induced abortion complicated by shock, incomplete
63552	1	21,400	Legally induced abortion complicated by shock, complete
63720	1	19,750	Unspecified abortion complicated by damage to pelvic organs or tissues
63731	1	0	Unspecified abortion complicated by renal failure
63741	1	15,102	Unspecified abortion complicated by metabolic disorder
63770	1	8,311	Unspecified abortion with other specified complication
63780	1	6,835	Unspecified abortion with unspecified complication
6388	1	25,320	Failed attempted abortion with unspecified complication
66803	1	27,334	Pulmonary complications, antepartum condition or complication
66822	1	6,314	Central nervous system complications of anesthesia or sedation in labor and delivery, delivered w/ mention of postpartum complication
66823	1	8,160	Central nervous system complications, antepartum condition or complication
66910	1	13,740	Shock during or following labor and delivery, unspecified as to episode of care or not applicable
67301	1	0	Obstetrical air embolism, delivered w/ or w/o mention of antepartum condition
67304	1	4,024	Obstetrical air embolism, postpartum condition or complication
67402	1	9,794	Cerebrovascular complications in the puerperium, delivered with mention of postpartum complication
7635	1	20,449	Fetus or newborn affected by maternal anesthesia and analgesia
99699	1	6,639	Complications of reattached extremity or body part, other
Subtotal	247,585	\$9,328,578,407	