NCCI Holdings, Inc.

NCCI RESEARCH BRIEF

July 15, 2006

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Gaining Perspective on the Relative Cost of Medical Services By Age of Claim and Accident Year

A large share of workers compensation medical costs incurred shortly after injury are for traumatic services, such as emergency care. Later on, services associated with chronic care, such as drugs and supplies, dominate. While these facts seem intuitive, the relative distribution of costs for other medical services over the life of a claim are not. Understanding them may be the first step for employers and claims payers to better manage escalating workers compensation medical costs.

As has been widely reported, workers compensation medical costs per claim have been growing much faster than the medical consumer price index (CPI). Workers compensation medical costs per claim grew at an average annual rate of 10.4 percent from 2000 to 2004.[1] In contrast, the medical CPI grew at an average annual rate of 4.4 percent over the same period. Workers compensation medical inflation is not uniform by service category; some areas, such as prescription drugs, are seeing higher cost increases than average. As a result, different mixes of services may be subject to differing inflation rates. These differences come into play in several phases of insurance, including claim reserving and reinsurance pricing.

To better assess these differences, the National Council on Compensation Insurance (NCCI) looked at medical payments for claims in accident years 1996 to 2002 according to 12 different service groups and 13 different service periods. The service groups included:

- office visits;
- physical therapy;
- emergency services;
- hospital services;
- diagnostic radiology;
- complex diagnostic testing;
- pathology;
- complex surgery and anesthesia;
- surgical treatments;
- supplies excluding drugs;
- drugs; and
- a miscellaneous category of “other.”

The service periods were broken down by 30-day increments for the first three months following the injury (1-30 days, 31-60 days, 61-90 days) and then by a three-month increment beginning with the fourth month (91-182 days), a six-month increment beginning at the seventh month (183-365), and eight year-long increments beginning with the second year. For additional perspective, NCCI also compared the total medical costs for the first year with the second and third years following injury, the fourth and fifth years following injury, and the sixth through ninth years following injury.

The results of our study show the relative distribution of costs by medical service group by service period. NCCI also found accident-year trends in the proportion of total medical costs by service period for some service groups.

Key Findings

For accident years 1996 to 2002, the share of medical costs for 8 of the 12 medical service groups generally declined as the service period became more distant from the date of injury. These 8 service groups were office visits, physical therapy, emergency services, hospital services, diagnostic radiology, complex diagnostic testing, pathology, and surgical treatments.

The service group for complex surgery and anesthesia had a higher share of total medical costs in the second year following injury than in the first year, but a declining share of costs in subsequent years.

For drugs, supplies excluding drugs, and “other,” the share of medical costs for the service group rose dramatically after the first year following injury.
Two trends that were evident among accident years for all service periods were a downward trend in the share of costs due to office visits and diagnostic radiology (x-rays) and an upward trend in the share of costs due to drugs.

Another standout trend involved complex diagnostic testing (e.g., CT scans and MRIs), for which there was a strong upward accident year trend in the first 90 service days and in the first year following injury.

The largest recent changes in cost per service were in the category “Hospital and related services” (see Appendix I). Categories involving professional health-care services and prescription drugs have also been subject to relatively high inflation. The remaining categories have generally been subject to lower inflation recently.

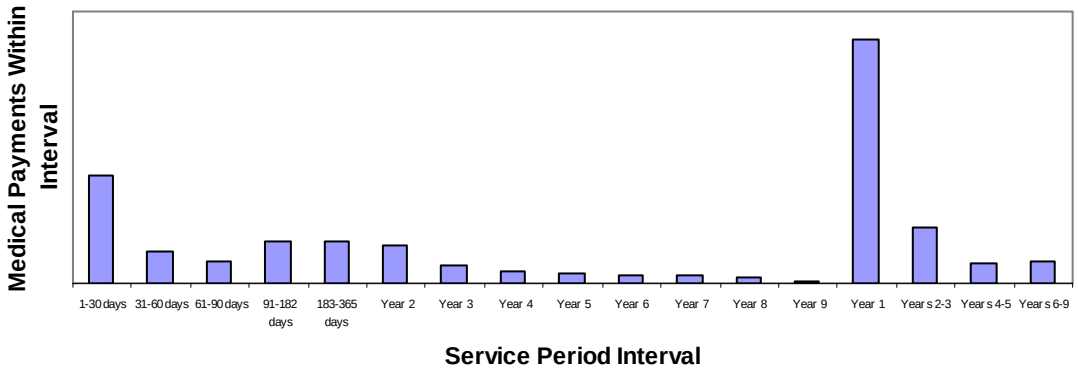
Background

NCCI used sample data provided by insurers covering accident years 1996 through 2002 at various evaluation dates through December 2004. Medical payments were compiled according to service period for 12 medical service groups.

Exhibit 1

Relative Magnitude of Medical Payments By Service Period Interval

(Based on Accident Year 1996 as of 12/31/2004)

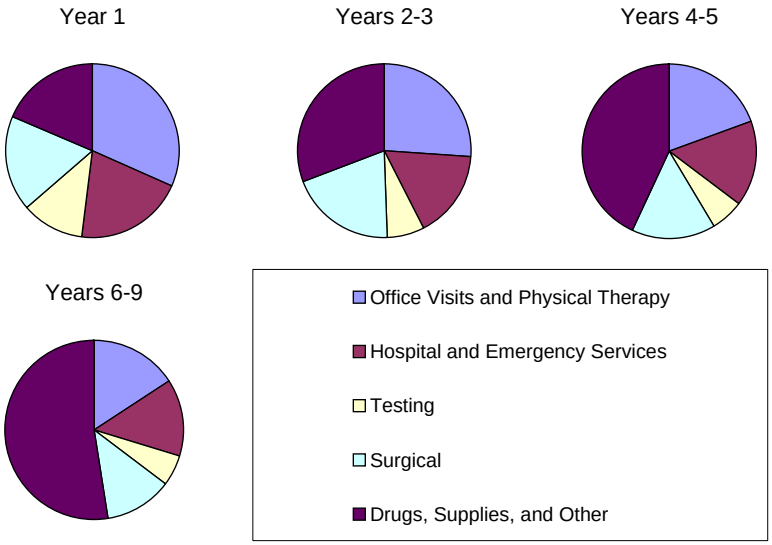


This study concentrates on the relative share of costs for the different medical services by service period, not the total costs by service period or total cost by type of service. Total costs were usually greatest for the first service year and tapered off in subsequent service years. The relative payments by service period for accident year 1996 are shown in Exhibit 1 (above).

Exhibit 2

Payment Proportions By Consolidated Service Group and Period

Accident Years 1996-2002 Combined, as of 12/31/2004



Overall Proportions of Costs by Service Category and Inflation

Exhibit 2 (above) shows the relative magnitude of payments by consolidated service group and service year. For purposes of this exhibit, the service groups were consolidated into five smaller groups: office visits and physical therapy; hospital and emergency services; testing; surgical; and drugs, supplies, and "other." Only the consolidated service group of drugs, supplies, and "other" shows increasingly higher payment proportions in the years following injury.

Exhibit 2 is based on data through 2004. Service years after 2004 might show different relative costs of medical services.

Inflation in medical service costs over the period 1996 to 2004 has roughly followed a three-tier pattern, according to the Bureau of Labor Statistics' medical CPI. Service categories ordered from highest to lowest inflation are

1. hospital and related services;
2. professional services and prescription drugs and medical supplies; and
3. nonprescription drugs and medical supplies.

For perspective in judging NCCI's study results, Appendix I details the changes in the components of the medical CPI over the period 1996 to 2004.

The categories used in the CPI do not correspond directly with the categories available in NCCI's workers compensation claims data. For example, NCCI's service group "other" includes some professional services. Additionally, NCCI's service group for drugs does not distinguish between prescription and nonprescription drugs. However, this category is overwhelmingly dominated by the costs for prescription drugs. Exhibit 2 demonstrates that as accident years age, there is no clear shift of costs into the lowest medical inflation CPI tier, nonprescription drugs and supplies. This is one factor contributing to high inflation in services covered by medical loss reserves.

Medical Services by Service Period and Accident Year

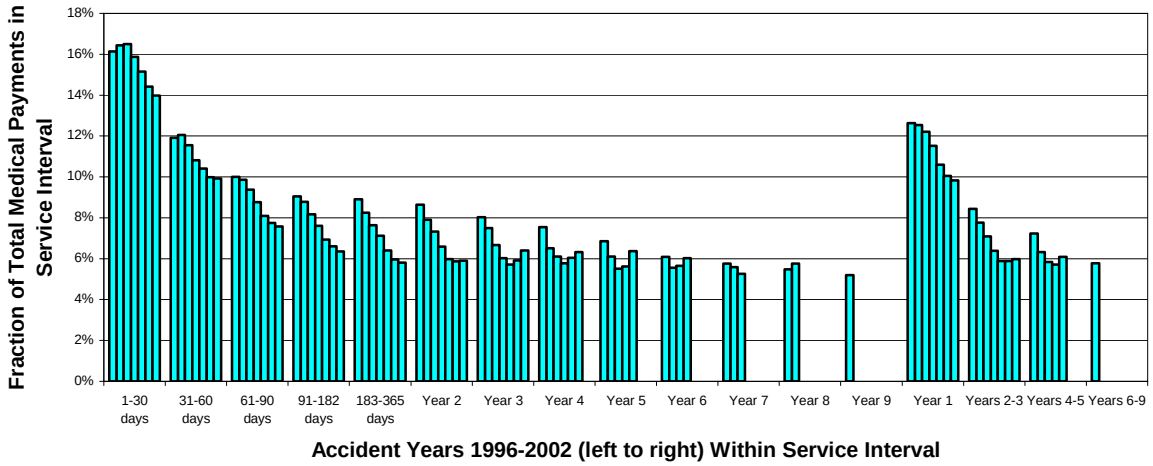
Exhibits 3 through 15 cover the 12 medical service groups as well as durable medical equipment, which is a component of the service group for supplies excluding drugs. Within these exhibits, each bar represents the share of total medical costs for the particular service group, accident year, and service period. This makes it easy to see both changes in the share of given services by service period and trends by accident year. Later service periods show fewer bars as fewer accident years are mature enough to be included.

Exhibits

In Exhibit 3, the fraction of total medical payments for office visits declined for the later service periods. There is also a clear decline by accident year within the first three service years. Whether this accident-year pattern will continue into later service years is not clear.

Exhibit 3

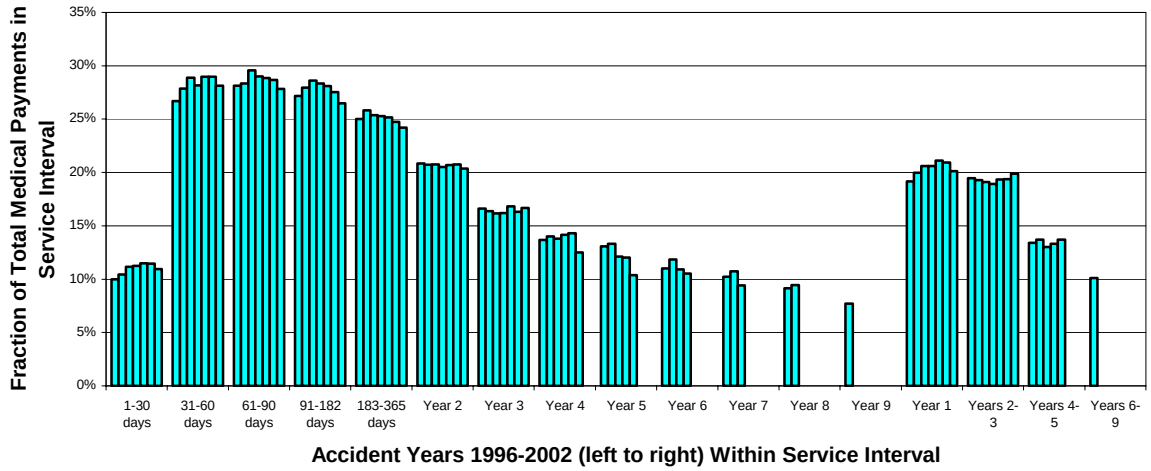
Office Visits



In Exhibit 4, the fraction of payments for physical therapy shows a declining share after the first six-month service period, but no definite pattern by accident year.

Exhibit 4

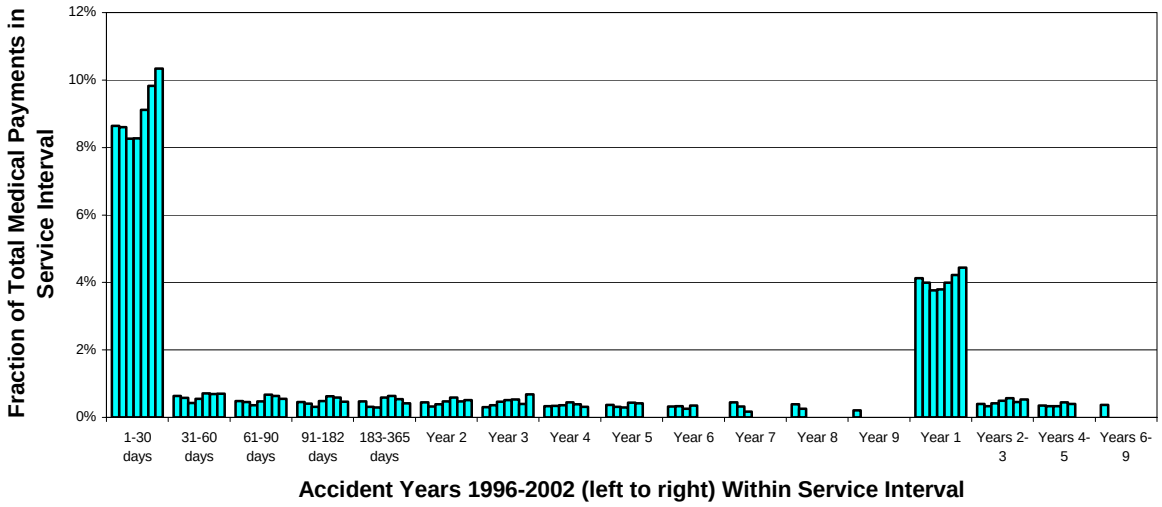
Physical Therapy



In Exhibit 5, as might be expected, the share of costs due to emergency services plummeted after the first 30-day service period. There is also an increasing trend in the share of costs by accident year within this first 30-day service period. There are no clear accident-year trends for the small shares in the rest of the service periods. Emergency services include ambulance and emergency room costs, as well as the bill for the emergency room physicians.

Exhibit 5

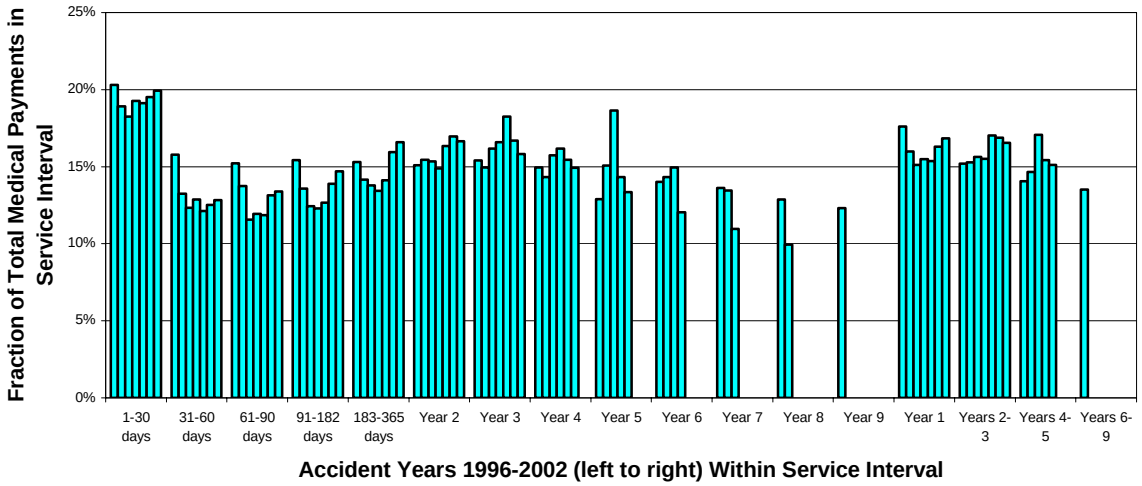
Emergency Services



In Exhibit 6, relative payments for hospital services show a slight decline in share for later service periods. There is no clear accident-year trend.

Exhibit 6

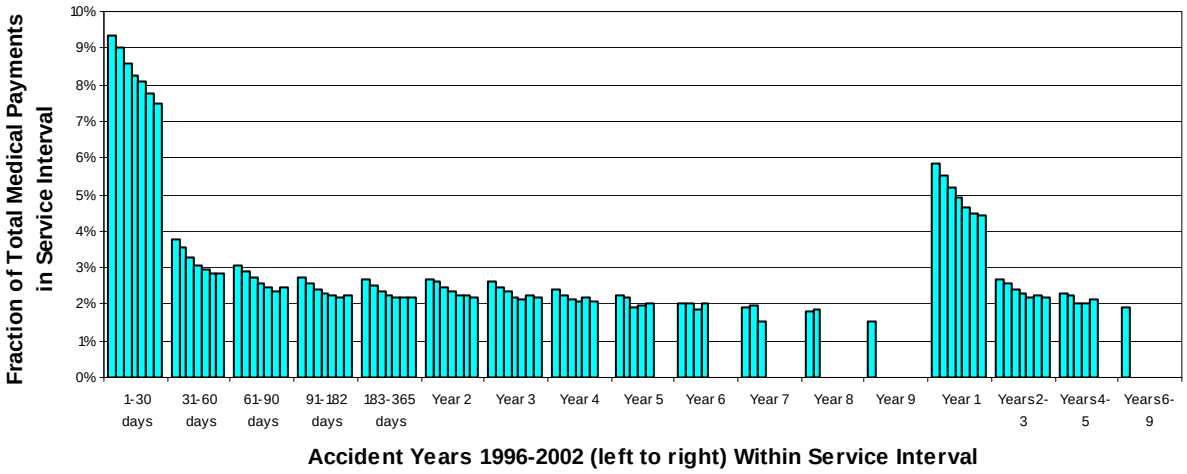
Hospital Services



In Exhibit 7, diagnostic radiology shows a strong decline in payment share for later service periods. There is a general declining trend by accident year.

Exhibit 7

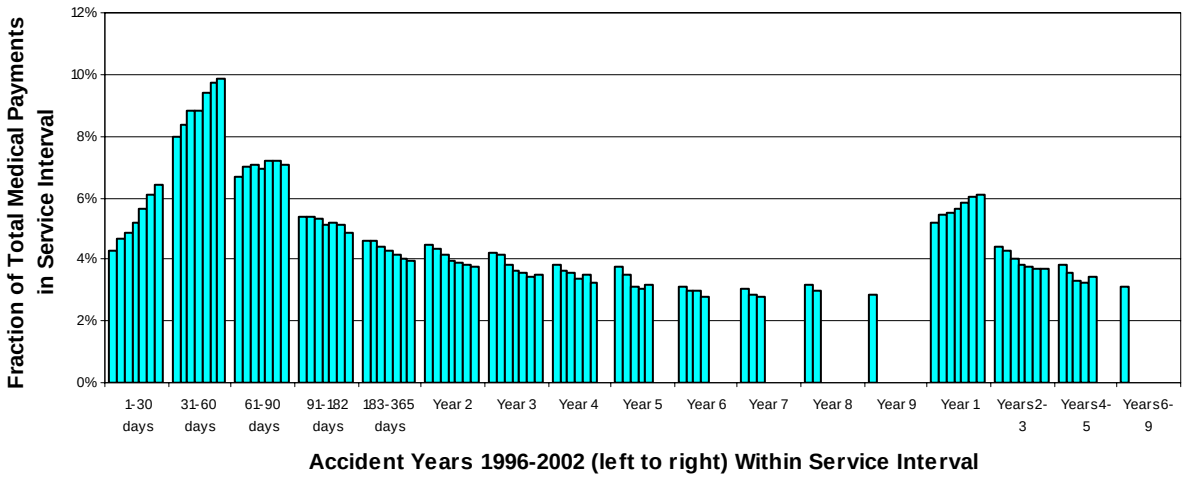
Diagnostic Radiology



In Exhibit 8, the fraction of payments for complex diagnostic testing represents a greater share of total medical payments for service days 31 to 60 than for service days 1 to 30. The share shows a steady decline after the first 60 service days. There is an increasing accident-year trend for the first service year. There is a declining accident-year trend for later service periods.

Exhibit 8

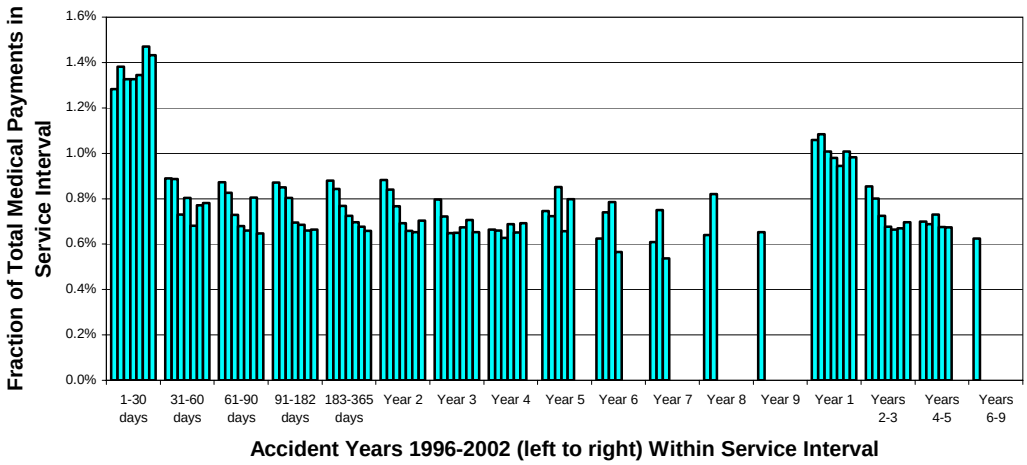
Complex Diagnostic Testing



In Exhibit 9, the fraction of payments for pathology dropped to a relatively constant share after the first 30 service days. The exhibit suggests there may be a declining trend by accident year for the first three years. Pathology includes all lab tests, whatever the source of the order for the tests.

Exhibit 9

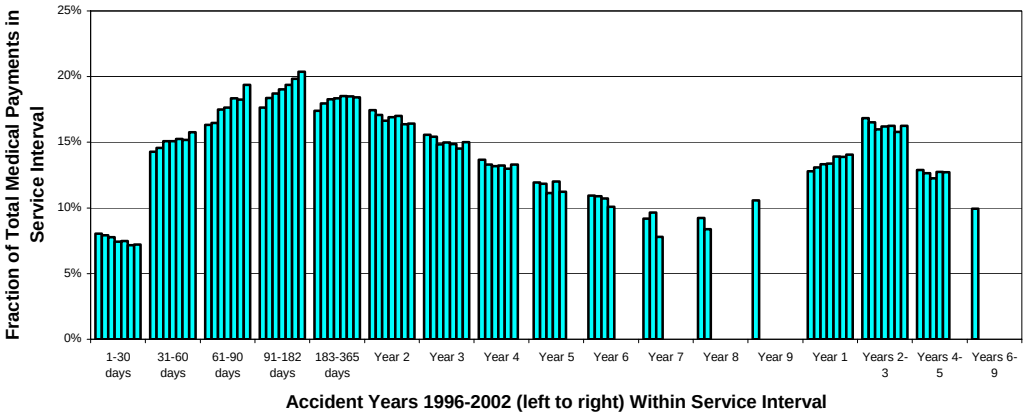
Pathology



In Exhibit 10, the fraction of payments for complex surgery and anesthesia increased in share over the first six service months, after which the fraction of payments declined at roughly the same rate. There is a decreasing accident-year trend in the first service month and an increasing accident-year trend for the next five service months.

Exhibit 10

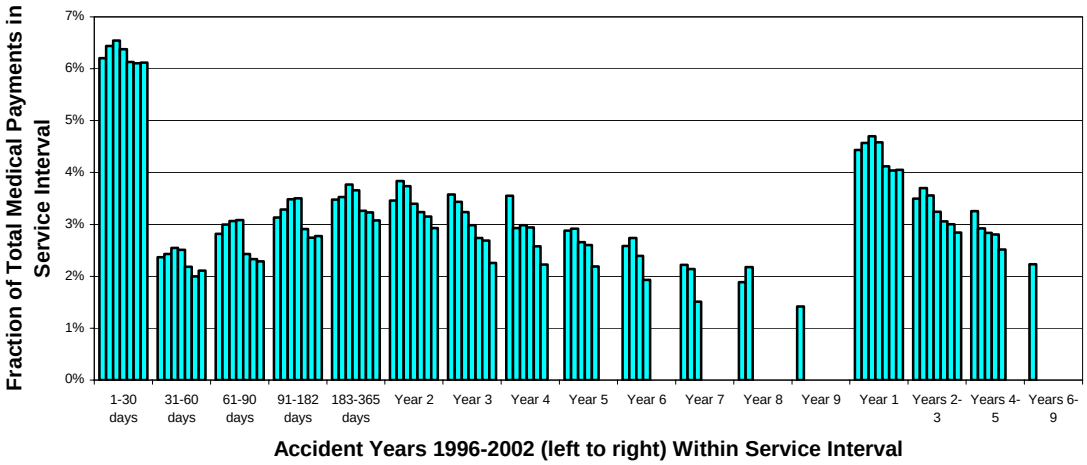
Complex Surgery and Anesthesia



In Exhibit 11, the fraction of payments for surgical treatments dramatically dropped in share after the first 30 service days and generally declined in share for later service years. There is a declining trend by accident year. Services falling under complex surgery and anesthesia are much more invasive than those falling under surgical treatments and are often scheduled in advance.

Exhibit 11

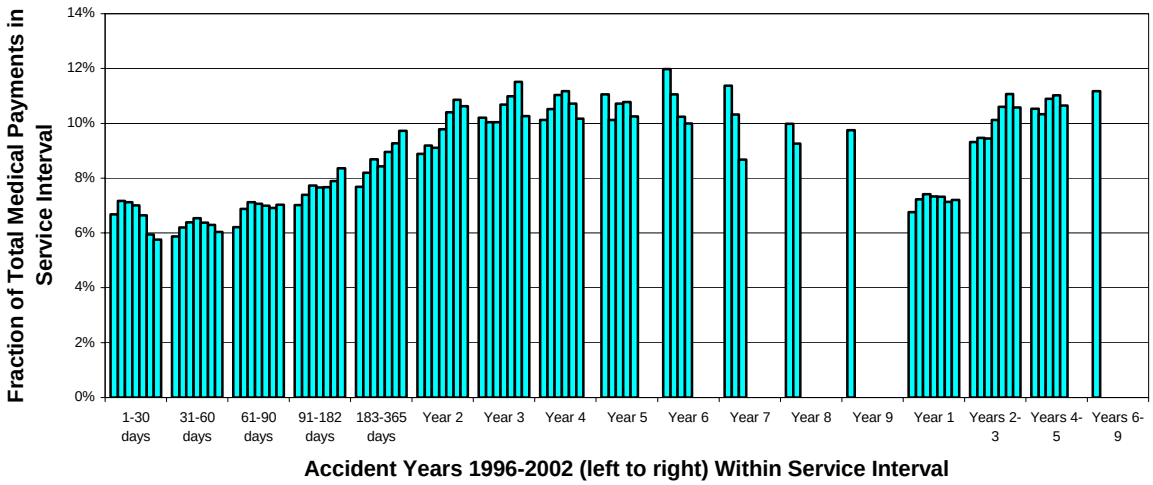
Surgical Treatments



In Exhibit 12, the fraction of payments for supplies excluding drugs increased in share over the service period from 60 days to three years. There is also an increasing trend by accident year for the same time frame.

Exhibit 12

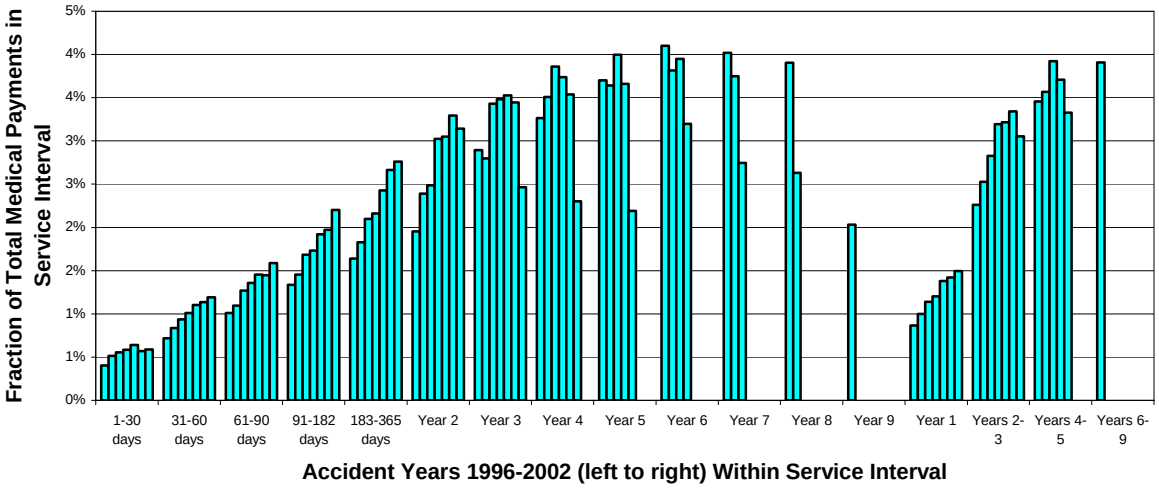
Supplies Excluding Drugs



In Exhibit 13, payments for durable medical equipment, a component of supplies excluding drugs, are the primary drivers of the service-period patterns and accident-year trends in Exhibit 12. The other components of supplies excluding drugs (e.g., durable medical equipment, hearing equipment, etc.) do not contribute significantly to these patterns and trends.

Exhibit 13

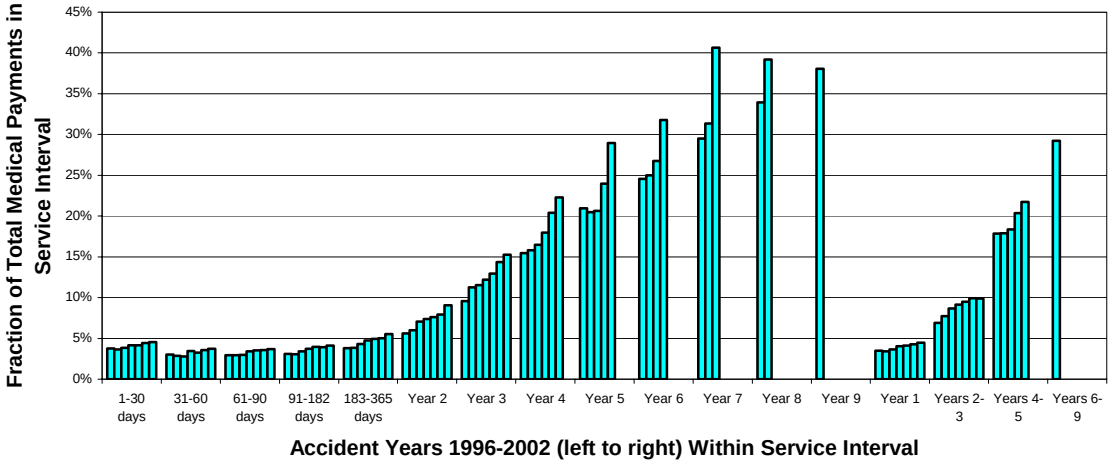
Durable Medical Equipment



In Exhibit 14, the fraction of payments for drugs increased dramatically in share after the first six months following injury. There is a strongly increasing trend by accident year. This trend in the share for drugs supports other evidence that prescription drug costs are a major cause of increases in medical case reserves. More details on trends in prescription drug costs are given in other NCCI studies.[2]

Exhibit 14

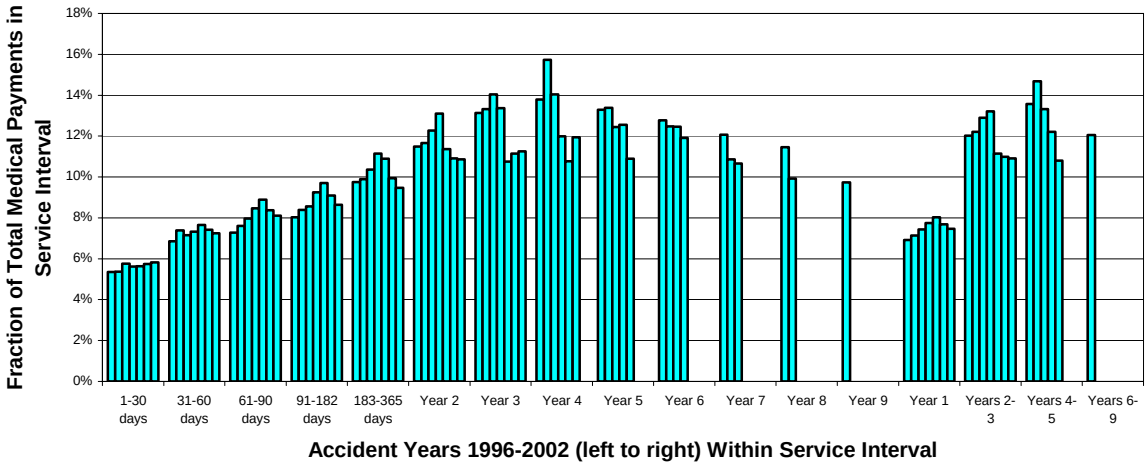
Drugs



In Exhibit 15, the fraction of payments for “other” (e.g., legal consultations, neuromuscular tests, diagnostic tests and injections, case management, etc.) increased in share up to three service years and declined for later service periods. There is no consistent trend by accident year.

Exhibit 15

Other



There is anecdotal evidence that home health care, the payments for which are included in the “other” category, is a major factor in the costs for late service years. An individual case reserve can have a dramatic increase when a family member who had been caring for the claimant dies, necessitating the costs associated with professional home health care. The hypothesis that this is a major factor in reserve trends is not addressed by this study because NCCI did have any data past the ninth service year.

Summary

NCCI sample data indicate both shifting patterns by service period within the same accident year and trends between accident years for the composition of medical service payments.

Appendix I—Medical Consumer Price Index Inflation

Table I.1
Cumulative Change in Consumer Price Index From 1996 Through 2004

Item	Cumulative Change
Medical care	+36%
Medical care commodities	+27%
Prescription drugs and medical supplies	+39%
Nonprescription drugs and medical supplies	+6%
Internal and respiratory over-the-counter drugs	+7%
Nonprescription medical equipment and supplies	+5%
Medical care services	+39%
Professional services	+31%
Physicians' services	+29%
Dental services	+42%
Eyeglasses and eye care	+15%
Services by other medical professionals	+24%
Hospital and related services	+55%
Hospital services	+53%
Inpatient hospital services	+47%
Outpatient hospital services	+66%
Nursing home and adult day care services	+48%

Table I.2
Bureau of Labor Statistics Definitions of Medical CPI Items

Item	Definition
Medical care	Medical care commodities and medical care services.
Medical care commodities	Prescription drugs, nonprescription over-the-counter-drugs, and other medical equipment and supplies.
Prescription drugs and medical supplies	All drugs and medical supplies dispensed by prescription. Mail order outlets are included. Prices reported represent transaction prices between the pharmacy, patient, and third party payer, if applicable.
Nonprescription drugs and medical supplies	All nonprescription medicines, vitamins, dressings, equipment, and supplies.
Internal and respiratory over-the-counter drugs	Nonprescription medicines taken by swallowing, inhaling, and as suppositories and enemas (i.e. aspirin, cough medicine, and vitamins).
Nonprescription medical equipment and supplies	Nonprescription medicines and dressings used externally, contraceptives, and supportive and convalescent medical equipment (i.e. adhesive strips, heating pads, athletic supporters, and wheelchairs).
Medical care services	Professional medical services, hospital services, nursing home services, and health insurance imputation.
Professional services	Physicians, dentists, eye care providers, and other medical professionals.
Physicians' services	Services by medical physicians in private practice, including osteopaths, which are billed by the physician. Includes house, office, clinic, and hospital visits. (Excludes ophthalmologists. See Eyeglasses and eye care.)
Dental services	Services performed by dentists, oral or maxillofacial surgeons, orthodontists, periodontists, or other dental specialists in group or individual practice. Treatment may be provided in the office or hospital.
Eyeglasses and eye care	Services provided by opticians, optometrists, and ophthalmologists. Includes eye exams, dispensing of eyeglasses and contact lenses, office visits, and surgical procedures in the office or hospital.
Services by other medical professionals	Services performed by other professionals such as psychologists, chiropractors, physical therapists, podiatrists, social workers, and nurse practitioners in or out of the office.
Hospital and related services	Services provided to inpatients and outpatients. Includes emergency room visits, nursing home care and adult day care. Includes transaction prices only.
Hospital services	Services provided to patients during visits to hospitals, ambulatory surgical centers, or other similar settings.
Inpatient hospital services	Services for inpatients. Includes a mixture of itemized services, DRG-based services, per diems, packages, or other bundled services.
Outpatient hospital services	Services provided to patients classified as outpatients in hospitals, free standing services facilities, ambulatory surgery, and urgent care centers.
Nursing home and adult day care services	Charges for residential care at nursing homes, nursing home units of retirement homes, and convalescent or rest homes. Also includes non-residential adult day care, a newer item with few price observations at this time.

John Robertson is a research focus lead, coordinating much of the research activity at NCCI. He is a fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries and has held positions at insurance companies and consulting firms. He has degrees in mathematics from Harvard College and the University of California at Berkeley.

Jonathan Evans is an actuary at NCCI. His work primarily involves the retrospective rating plan, the experience rating plan, catastrophe modeling, and corporate research projects. He is a fellow of the Casualty Actuarial Society and a member of the American Academy of Actuaries.

[1] See Mealy, D., *State of the Line,* presentation at the Annual Issues Symposium, May 5, 2005, in Orlando, Florida, available at *http://www.ncci.com/media/pdf/SOL_2005.pdf*.
[2] See, e.g., Llewellyn, B., and J. Stevens, "Workers Compensation Prescription Drug Study—2004 Update," *NCCI Research Brief* 1 (October 2004), available at *http://www.ncci.com/media/pdf/rx_04.pdf*.