Integration of Managed Care in Workers Compensation

Brian Z. Brown, FCAS, and
Michael C. Schmitz, ACAS

Title: **INTEGRATION OF MANAGED CARE IN WORKERS COMPENSATION**

By: Mr. Brian Z. Brown, F.C.A.S., M.A.A.A.
Mr. Michael C. Schmitz, A.C.A.S., M.A.A.A.

Brian Z. Brown is a Fellow of the Casualty Actuarial Society, a Member of the American Academy of Actuaries and a Consulting Actuary in the Milwaukee office of Milliman & Robertson, Inc. Brian holds a bachelor of science degree in Economics from the Illinois State University. Mr. Brown has several clients who are using managed care concepts.

Michael C. Schmitz is an Associate of the Casualty Actuarial Society, a Member of the American Academy of Actuaries and an Associate Actuary in the Milwaukee office of Milliman & Robertson, Inc. Michael holds a bachelor of business administration degree in Actuarial Science and Risk Management/Insurance from the University of Wisconsin. Mr. Schmitz has conducted studies for several workers compensation clients with managed care programs.

INTEGRATION OF MANAGED CARE IN WORKERS COMPENSATION

by Brian Z. Brown and Michael C. Schmitz

I. INTRODUCTION

The following table displays countrywide medical cost trends over the past nine years for both workers compensation medical costs and all healthcare costs.

Annual Trend in Medical Costs		
Calendar/Accident Year	**Workers Compensation Medical Severity[1]**	**Medical CPI[2]**
1986	9%	8%
1987	10	7
1988	12	7
1989	10	8
1990	10	9
1991	10	9
1992	4	7
1993	5	5
1994	2	5

As the above table displays, medical cost increases since 1992 have been significantly lower than for the 1986-1992 time period. This trend appears in both workers compensation and general healthcare costs. However, the decreased trend is more significant for workers compensation medical costs. One factor affecting both trends is the increased use of managed care programs.

This paper will describe managed care and explain how managed care affects workers compensation rates. In the following sections of our paper, we will define the term managed care and summarize some recent studies measuring the impact of managed care savings. We will then describe approaches which healthcare providers and insurers use to price capitated products. Dividend programs between insurers and managed care organizations are also discussed. In the last two sections, we discuss data considerations involved as healthcare providers begin to assume more risk, and we present some concluding remarks.

[1] Based on a presentation at the 1995 CLRS by Ron Retterath of the National Council on Compensation Insurance.
[2] U.S. Department of Labor Bureau of Labor Statistics, "The CPI Detailed Report", 1994, Washington D.C.

II. DESCRIPTION OF MANAGED CARE

Managed care involves combining medical cost containment with optimal medical treatment in order to:

- provide medical services at a lower overall total cost;
- increase the overall quality of care; and
- expedite worker re-entry into the workforce.

Managed care can be implemented to contain costs if unnecessary medical procedures are being performed, medical fees exceed competitive price levels, or if some necessary medical procedures are not currently being used.

Insurance companies have instituted various methods in recent years to reduce medical costs. These methods can be segregated into two broad categories:

- financial arrangements; and
- behavior modification methods.

The financial arrangements include discounted fee for service agreements, case rates, capitation contracts and dividend programs. The behavior modification methods include utilization review, case management and second-opinion programs. These cost containment measures are discussed below.

If medical costs are perceived to be too high or if the insurer has significant bargaining power, pre-negotiated discounts are oftentimes implemented. Thus, a health care provider will agree to a discount from standard rates if injured workers are treated by a member of the health care provider's network. The pre-negotiated discounts are often 15% to 25% below the charges allowed by the legislated workers' compensation fee schedule for certain states. For states that do not have fee schedules, the pre-negotiated discounts are typically less than the *usual and customary* charges.

Case rates refer to a flat fee per claim for medical costs. Typically, the flat fee will vary by type of injury (e.g., broken ankle). Thus the insurance carrier pays the healthcare provider a flat amount to compensate it for all medical costs for a specific injured worker. Thus the risk that actual costs exceed the average (or expected) costs is transferred from the insurance carrier to the healthcare provider. However, insurance carriers will need to monitor the cost effectiveness of case rates since these arrangements may encourage providers to substitute "bed rest" as a treatment in place

of more expensive treatments. Thus, case rates may result in a rise in indemnity costs if not properly managed[3].

In a capitated arrangement the healthcare provider receives a flat fee. In exchange, the healthcare provider agrees to provide appropriate medical services for all injured workers subject to the contract that it treats during a certain time period. Typically claims occurring outside of the state are excluded and only a predetermined dollar limit of medical treatment costs are covered on catastrophic claims. Also, the capitation agreement usually applies only to medical services during the first, second or third year subsequent to the injury date. As is discussed later, under this arrangement, the workers' compensation insurer has transferred much of the predictable exposure to the Healthcare provider while the insurer retains the less certain (more variable) exposure.

Dividend plans essentially return some of the projected workers compensation savings, due to the managed care program, to the Healthcare provider. These arrangements are discussed in section four.

In utilization reviews, proposed medical procedures are evaluated, to determine their appropriateness. The three utilization review techniques most frequently used are concurrent reviews, retrospective reviews and pre-admission certification. Concurrent reviews are designed to immediately recognize inappropriate treatment patterns and alter the health care services being provided for a worker. Retrospective reviews are designed to detect errors in past treatment. These errors can then be brought to the attention of the provider in an effort to curb inappropriate or excess care. Pre-admission certifications are used to direct patients away from costly inpatient care to outpatient services where appropriate.

Case management involves a qualified professional (usually a nurse) overseeing the progress of an injured employee to assure appropriate and timely care. Case managers will typically work closely with all parties involved (employees, employers and physicians) to get the injured employee back to work as quickly as possible, even if the employee's job duties need to be redefined. The emphasis on returning an employee back to work as quickly as possible is an attempt to keep a worker from becoming conditioned (or feeling entitled) to workers compensation benefits. Generally, the longer the period of disability, the more difficult it becomes to bring a worker back into the work force.

Second-opinion programs are designed to reduce the incidence of surgical procedures by requiring the authorization of such procedures by two physicians. These procedures

[3] Dividend compensation arrangements have been introduced as an attempt to offset this reduction in treatment incentive. These arrangements are discussed in section four.

rely on the "sentinel" effect (i.e., the impact that a peer review can have on a physician's recommendation). The effectiveness of these programs has been difficult to ascertain. Many believe that they result in no net reduction in surgical procedures since some patients, who otherwise would not have had surgery, will consent to surgery after the confirmed first opinion. Moreover, these programs carry relatively high administrative costs.

III. POTENTIAL COST SAVINGS DUE TO MANAGED CARE INITIATIVES

The following table displays the estimated cost savings based on three studies:

MANAGED CARE SAVINGS[4]				
	Florida Study		NH Assigned	
	HMO	PPO	Risk Plan	Intracorp
Average Claim Cost Change	-60%	-28%	-7% to -12%	-23%

As the above table displays, the cost savings estimates vary significantly from study to study. However, in all cases there is an indicated savings.

There are several reasons for the variation in estimated savings by study. The savings largely depend on the procedures and practices in place prior to implementing a comprehensive managed care program. If the claim handling in the prior program simply consisted of paying bills as they are submitted, then an aggressive managed care program can result in large savings. On the other hand, if the claim handling consisted of case management, review of physician's charges and some negotiated discounts, then the savings are likely to be less substantial. Therefore, in estimating future managed care savings, it is important to determine what baseline you are measuring against.

Another reason for the variation of savings estimates is that the term managed care has been used rather generically. There are different forms and different levels of managed care. Some plans may include little more than fee discounts and should not be considered comprehensive managed care programs. Other comprehensive programs, which include all of the elements discussed in Section II, are likely to produce much more significant savings.

[4] See "Recent Trends in Workers Compensation Coverage" by Brian Z. Brown and Melodee J. Saunders, CAS Forum, Summer 1996.

Several other factors will affect the savings, including the following:

- the degree to which injured workers buy-into the program;
- the degree to which work-force managers buy-into the program. It is especially important that they participate in creating light duty jobs to expedite worker re-entry into the workplace; and
- the ability of employers to direct injured workers to certain providers.

IV. PRICING CAPITATED PRODUCTS

During the last few years, actuaries have begun to price capitated products. This section will describe several approaches which are used to price these products for workers compensation medical exposures.

Pricing Based on Health Insurer Data

Health actuaries have collected a significant amount of data related to medical costs for non-occupational injuries and diseases. This data includes the benchmark costs for a particular treatment (by geographical area) along with the likelihood of methods of treatment given a specific injury.

This information is collected by ICD-9 and CPT codes, terms which are foreign to many casualty actuaries. ICD-9 code refers to the 9th revision of the International Classification of Diseases. Statistics at the ICD-9 level can be compiled to determine a benchmark severity for an injury. In this presentation we will use an example for ankle injuries. CPT code is the code assigned to a medical procedure under the Physicians Current Procedure Terminology. ICD-9 and CPT codes can be combined to define the injury and treatment (e.g., fracture of ankle, simple; fracture of ankle, closed therapy; fracture of ankle, surgery).

Milliman & Robertson, Inc. has developed Healthcare Management Guidelines (HMG) for workers compensation based on data from Managed Care plans and input from employed physicians. These guidelines include the range of time within which injured workers are expected to return to work by injury type (i.e., grouping of ICD-9 codes). The Healthcare Management Guidelines also include frequency and cost statistics for the procedures used in the course of treatment of various injuries (i.e., by CPT code).

The Healthcare Management Guidelines can be used to price capitated products.[5] Exhibit 1 displays treatment probabilities and the cost of services for the initial care for an ankle fracture or dislocation.

The exhibit indicates that 80% of ankle fractures and dislocations are treated by an office visit and 20% are treated via an emergency room visit. The exhibit also delineates the services which would be used in an optimally treated case and the cost of the various services (based on the geographical area).

Exhibits 2 through 4 display the treatment probabilities, procedures, cost of procedures and estimated total cost for subsequent treatment. Methods of subsequent treatment are divided into:

- Subsequent Therapy by a primary care physician (Exhibit 2);
- Therapy by a Specialist (Exhibit 3); or
- Surgery by a Specialist (Exhibit 4).

Based on optimal treatment patterns and the health insurance data outlined above, the costs and treatment probabilities for an ankle fracture and dislocation are estimated as follows:

Probability	Course of Subsequent Treatment	Cost of Treatment*
71%	Therapy by Primary Care Physician	$1,280
4	Closed Therapy by Specialist	2,900
25	Open Surgery by Specialist	4,900
Average		$2,250

*Including the cost of initial care

This example results in the estimated medical costs for an optimally managed case.[6] It is anticipated that care will not always be optimally managed, and some workers will require more care than anticipated. This factor should be included into the pricing via a loading for additional costs or procedures.

[5] This is discussed in detail in "Recent Trends in Workers Compensation Coverage" by Brian Z. Brown and Melodee Saunders, CAS Forum, Summer 1996

[6] The above example is based on a presentation by Richard Minifie, ASA, MAAA of Milliman & Robertson, Inc. titled "Developing Capitation Rates Consistent with Clinical Practice Guidelines".

The final element which needs to be considered in deriving a capitated rate is the probability of a certain type of claim. Historical data will provide estimates of the frequency of claims by injury per $100 of payroll. The capitated rate is then equal to the product of the following (summed across all injury types):

- The probability by type of injury; and
- The cost of the injury.

This procedure developes a capitated rate for all injuries occurring during a year regardless of when treatment is provided. A one year capitated rate would involve altering the treatments and costs on Exhibits 1-4 to only reflect the treatments expected to be provided during the first year.

Washington State Model

Starting in 1994, a managed care organization pilot program was introduced in Washington through the Washington State Fund (the Fund). The program provided for a one year capitation between the Fund and two managed care organizations. The attached Exhibit 5 displays some of the characteristics between the current system and the MCO pilot program.[7]

The fund studied data by date of service and date of injury in order to derive capitated rates for a one year period. After a one year period, financial arrangements revert back to fee for service. Furthermore, after the first $100,000 of treatment on a claim, fee for service charges apply for that claim. These provisions are built into the capitation rates.

The capitation payment is derived for each firm as the product of the following factors summed across all classes:

- Hours worked by risk class;
- Hourly capitation rate by risk class; and
- The firm's experience modification factor.

The fund observed a strong correlation between the medical premium base rates (in Washington, medical rates are displayed separately from indemnity) and the 12 month

[7] This section is based on a presentation by Bill Vasek titled "Implementing Capitated Managed Care in Workers Compensation: The Washington State Model".

capitated rate. The attached Exhibit 6 graphically displays the comparison by class. As the exhibit displays, the correction coefficient is 99.4%. The 12 month capitated rate is equal to roughly 34% of the normally calculated occurrence medical premium base rate. If analyses of future states data display similar results, one way to price capitated products may be as a function of the medical pure premium.

Multiple Year Capitation Arrangements

Some MCO's are offering multiple year (frequently 3 year) capitation arrangements to insurance carriers and pool's. Typically the carrier or pool will pay a flat fee (sometimes a percentage of premium) and the MCO will agree to provide medical treatment to injured workers for 3 years subsequent to the injury date. Also the MCO will usually only be responsible for a fixed dollar limit per claim (we will use $100,000 in our example).

One way to estimate the expected losses for the MCO relies on estimating the following:

- The ultimate losses for the carrier for workers compensation coverage on an occurrence year basis;
- The portion of the total losses which is attributable to medical losses;
- The portion of medical payments above $100,000 per claim; and
- The payment patterns for medical losses.

Several methods can be used to estimate the ultimate losses for the carrier (e.g., based on historical experience, filed pure premiums in the state, etc.). The portion of total losses associated with medical losses can also be estimated based on historical data or industry sources. Alternately, medical losses may be estimated separately.

While the NCCI estimates the distribution of the combined sum of medical and indemnity losses we are not aware of industry data which estimates a separate size of loss distribution solely for medical losses. However, historical data can be used to estimate medical payments above $100,000. Based on a separate analysis of medical claims, an empirical or theoretical size of loss distribution can be used to produce estimates of the $100,000 medical excess loss pure premium factors (i.e., the percentage of medical losses excess of $100,000 relative to total medical losses). For

illustrative purposes, we will use a medical excess loss pure premium factor of 28% at $100,000.[8]

The next step is to estimate the proportion of medical dollars which will be spent within 3 years of the injury date. If we have historically analyzed accident year data, this percentage should be roughly in between the losses paid three years and four years after the beginning of the accident year.[9] For example, if a claimant is injured on the first day of the accident year and begins receiving treatment immediately, then the capitation agreement will run out after 36 months (i.e., the end of the 3rd year). If a claimant is injured on the last day of the accident year and begins receiving treatment immediately, then the capitation agreement on this claim will run out after 48 months from the beginning of the accident year (i.e., the end of the 4th year). If data by accident year and date of injury is available, the percentage of medical costs paid within 3 years of injury date can be computed directly. The attached Exhibit 7 displays a hypothetical example for pricing the 3 year capitation agreement.

One important consideration which needs to be addressed when pricing workers compensation products with a capitation agreement is the risk load. For example, using the numbers in Exhibit 7 we have the following:

(A)	Expected Losses	=	$11,250,000
(B)	Capitation Price	=	$3,240,000
(C)	Losses Not Subject to Capitation (A) - (B)	=	$8,010,000

For illustrative purposes, we will assume that the insurer typically includes a risk load which will results in the loss provision in the rates being adequate at the 75% confidence level amount. The NCCI table of insurance charges can assist in determining the confidence level associated with losses. The distribution of potential loss outcomes depends on:

- The expected value of losses (larger loss amounts exhibit less variability);
- The state (states with high average severities result in a more disperse loss distribution);
- Hazard group (low hazard group exposures have lower severities and the distribution of losses is less volatile); and

[8] We have found that empirical medical excess loss pure premium factors have generally exceeded the factors for combined medical and indemnity losses at $100,000. Thus, the 28% factor selected for medical losses exceeds the 18.4% factor used below in Exhibit 10 for total losses.

[9] This does not reflect late reported claims and reopened claims.

- Loss limit (if the insurer cedes losses above a certain dollar limit, this results in a more condensed net loss distribution).

Also, if the insurance carrier is large enough, its own loss experience can be used to model the loss distribution.

The attached Exhibit 8 graphically displays the projected distribution of losses associated with the insured with the risk characteristics on Exhibit 7. The loading at a 75% confidence level is approximately 17%. Therefore, the premium provision for losses including risk loading would be:

$$\$11,250,000 \times 1.17 = \$13,163,000.$$

This results in a risk margin of approximately $1.9 million (i.e., $13.163 million minus $11.25 million).

With a capitation arrangements as illustrated on Exhibit 7, $3,240,000 of expected losses is replaced with a guarantee from the MCO. Therefore, the carrier may not want to collect the entire $1.9 million risk load. If the carrier decides to include a 17% loading applicable to the expected losses less the losses covered by the capitation agreement, the resulting risk load provision would be:

$$(\$11,250,000 - \$3,240,000) \times 0.17 = \$1,362,000.$$

However, the capitation agreement is eliminating the more predictable medical losses, and leaving the more variable medical losses to be covered by the insurer (after the three year period expires and the excess portion of the more serious claims).

Modeling the capitation arrangement based on the projected size of loss distribution for losses excluding capitated medical costs results in the graph on Exhibit 9. The above approach using the same 17% risk load generates a risk margin which is too low. The 75% confidence level risk margin based on modeling the losses excluding capitated medical costs is approximately $1.8 million (i.e., $8.01 million x 0.22), or an amount which is in between the two above risk margins.

The capitation risk transfer also affects the company's loss reserves since:

- The carrier has transferred to the MCO the more predictable medical losses; and
- The carrier is left with the less predictable medical losses (the payments in excess of $100,000 or large claims and the payments made 3 years after the date of injury).

The above two points result in the carrier's reserves being relatively more difficult to estimate.

VII. DIVIDEND PROGRAMS

Many carriers have entered into dividend programs with MCO's to:

- Create an incentive for MCO's to return injured workers back to work;
- Reward the MCO for managing care efficiently and effectively; and
- Have the MCO guarantee payments to carriers if loss experience is adverse.

An example of an incurred loss dividend plan is discussed on Exhibits 10 and 11.[10] This plan involves comparing the actual reported losses to an expected loss provision two years after the end of the accident or policy year.

The dividend is equal to a portion of the amount by which actual losses are below target losses. In other words, to the extent that the MCO is able to reduce costs, part of the savings will be shared with the MCO.

The above is like participating dividend plans which have historically been used in workers' compensation. One factor which needs to be addressed in developing dividend plans is that loss experience can be favorable simply due to chance. For example, if the plan pays a dividend for a loss ratio below 75%, we want to quantify dividends expected to be paid simply as a result of random variation in total annual loss levels. When the "expected" loss ratio is 75%, some years will have loss ratios above or below 75% due to chance. The possible effect of random outcomes can be measured by using the aggregate loss ratio distribution in conjunction with the dividend plan terms to estimate the expected dividend. As the table below displays, the effects are greatest for the smaller subject premium levels.

Subject Premium	Expected Dividend Effect Due to Chance*
100,000	8.0%
1,000,000	4.5%
10,000,000	2.6%
100,000,000	1.3%

[10] "See Recent Trends in Workers Compensation Coverage" Brian Z. Brown and Melodee J. Saunders, CAS Forum, Summer 1996 for a more complete discussion of dividend plans.

* As a percentage of subject premium.

Additionally, to the extent that the MCO is anticipated to reduce the expected loss ratio, the carrier can expect a larger dividend be paid. This should be factored into pricing the carrier's workers compensation products. Additionally, a dividend reserve should be established to the extent that such loss sensitive contracts are expected to result in dividends. The expected dividend can be estimated using the aggregate loss ratio distribution in conjunction with the dividend plan terms based on the lower expected loss ratio (i.e., reflecting projected managed care savings).

The attached table displays the dividend (based on the parameters in Exhibits 10 and 11) as a percentage of standard premium, based on various premium size and loss ratio combinations. The loss ratio distribution is based on our interpretation of the NCCI's table of insurance charges.

Dividend Plan - Dividend As A Percentage of Subject Premium Target Loss Ratio - 75%*			
	Expected Loss Ratio After Projected Managed Care Savings		
Subject Premium	**75%**	**65%**	**55%**
100,000	8.0%	8.6%	9.3%
1,000,000	4.5%	5.4%	6.4%
10,000,000	2.6%	3.6%	4.9%
100,000,000	1.3%	2.8%	4.3%

*Based on dividend plan displayed on Exhibits 10 and 11

VIII. DATA CONSIDERATIONS

Typically, MCO and Health insurers rate health services based on variables including age, sex, marital status, geographical location, etc. Variables such as occupation and salary are not used.

Therefore, to fully integrate workers compensation and health insurance, additional data will need to be captured and stored in a central database. For example, in order to know if doctors are over utilizing certain procedures, CPT codes would need to be captured by workers compensation carriers. Therefore carriers which integrate workers compensation and health data will be at a competitive advantage. Some of the data items to be captured would include:

- Date of injury;
- Date of medical services;
- ICD-9 code;
- CPT code;
- Job classification of injured worker;
- Injured worker's age and sex;
- State;
- Department name (for large employers); and
- Date returned to work.

Armed with this data the workers compensation carrier could determine which treatment plans accelerate workers re-entry to the work-force. Also, carriers could determine which types of injuries resulted in longer durations off of work. This analysis may also shed some light on what factors or injuries (e.g., ICD-9 code groupings) lead to inadequate case reserves. Such situations could be investigated and possible solutions to more effectively manage care can be found.

IX. CONCLUSION

The changes in the healthcare market have had a significant influence on workers compensation. Programs used for many years in the health market are being used more and more frequently in workers compensation. This paper has attempted to integrate workers compensation and health insurance concepts, and illustrate some of the effects of the risk transfers inherent in recently introduced workers compensation managed care contracts.

Exhibit 1

Table 3a
Ankle Injuries - Optimally Managed
Fractures and Dislocations

Initial Care

Ankle Injuries :	4.23%	of Lost Work Day Cases	**Charge Basis**
Fractures and Dislocations :	11.50%	of Ankle Injuries	Example Fee Schedule
Initial Care :	100.00%	of Ankle Fractures and Dislocations	Center Date: 7/1/96

Treatment Probabilities

(a) Treatment % of Total	(b) Procedure % of (a)		(c) Course of Treatment	(d) Procedure Code	(e) Number of Services	(f) Price Per Service
80.00%		I.	**Office Visit**			
	75.00%	1.	Office/Outpatient New Detailed Moderate	99203	1.0	$80.22
	25.00%	2.	Office/Outpatient New Comp Moderate	99204	1.0	$114.60
	100.00%	3.	X-ray Exam, Ankle-Complete	73610	1.0	$58.07
	70.00%	4.	Pain Injection	90782	1.0	$14.33
	10.00%	5.	Tetanus Toxoid Injection	90782	1.0	$14.33
	100.00%	6.	Apply Short Leg Splint	29515	1.0	$63.13
	100.00%	7.	Trilateral Splint (Plaster/Fiberglass)	AP032	1.0	$100.00
	100.00%	8.	Crutches	AP001	1.0	$18.63
				Subtotal, Sum of (b) x (e) x (f):		$340.11
20.00%		II.	**Emergency Room Visit**			
	50.00%	1.	ER Visit Focused Mod Complex	99283	1.0	$94.55
	50.00%	2.	ER Visit Severe Mod Complex	99284	1.0	$143.25
	100.00%	3.	ER Charge - Ankle Fracture	ER002	1.0	$32.98
	100.00%	4.	X-ray Exam, Ankle-Complete	73610	1.0	$58.07
	70.00%	5.	Pain Injection	90782	1.0	$14.33
	10.00%	6.	Tetanus Toxoid Injection	90782	1.0	$14.33
	100.00%	7.	Apply Short Leg Splint	29515	1.0	$63.13
	100.00%	8.	Trilateral Splint (Plaster/Fiberglass)	AP032	1.0	$100.00
	100.00%	9.	Crutches	AP001	1.0	$18.63
				Subtotal, Sum of (b) x (e) x (f):		$403.17

Total Cost, Sum of (a) x Subtotal	**$352.72**

Table 3b
Ankle Injuries - Optimally Managed
Fractures and Dislocations

Subsequent Therapy by PCP

			Charge Basis
Ankle Injuries :	4.23%	of Lost Work Day Cases	Example Fee Schedule
Fractures and Dislocations :	11.50%	of Ankle Injuries	Center Date: 7/1/96
Subsequent Therapy by PCP :	71.00%	of Ankle Fractures and Dislocations	

Treatment Probabilities

(a) Treatment % of Total	(b) Procedure % of (a)	(c) Course of Treatment	(d) Procedure Code	(e) Number of Services	(f) Price Per Service
100.00%		**I. Therapy**			
	100.00%	1. Office/Outpatient Est Expanded Focused	99213	1.0	$51.57
	90.00%	2. Apply Cast Short Leg	29405	1.0	$84.18
	90.00%	3. Cast Materials, Short Leg	AP048	1.0	$75.00
	10.00%	4. Apply Short Leg Splint	29515	1.0	$63.13
	10.00%	5. Trilateral Splint (Plaster/Fiberglass)	AP032	1.0	$100.00
	80.00%	6. Pain Medication	RX001	7.0	$2.88
	60.00%	7. NSAIDs	RX002	10.0	$2.40
			Subtotal, Sum of (b) x (e) x (f):		$241.67
100.00%		**II. Follow-up Care**			
	100.00%	1. Office/Outpatient Est Expanded Focused	99213	4.0	$51.57
	100.00%	2. X-ray Exam, Ankle-Complete	73610	4.0	$58.07
	90.00%	3. Apply Cast Short Leg - Walking	29425	1.0	$105.22
	90.00%	4. Cast Materials, Short Leg - Walking	AP049	1.0	$90.00
	30.00%	5. Phys Med-Therapeutic Exercises	97110	5.0	$45.84
			Subtotal, Sum of (b) x (e) x (f):		$683.02

Total Cost, Sum of (a) x Subtotal	**$924.69**

Table 3c
Ankle Injuries - Optimally Managed
Fractures and Dislocations

Therapy by Specialist

Ankle Injuries :	4.23%	**of Lost Work Day Cases**	**Charge Basis**
Fractures and Dislocations :	11.50%	**of Ankle Injuries**	Example Fee Schedule
Therapy by Specialist :	4.00%	**of Ankle Fractures and Dislocations**	Center Date: 7/1/96

Treatment Probabilities

(a) Treatment % of Total	(b) Procedure % of (a)	(c) Course of Treatment	(d) Procedure Code	(e) Number of Services	(f) Price Per Service
100.00%		**I. Pre-Therapy Care**			
	100.00%	1. ER Visit Severe Mod Complex	99284	1.0	$143.25
	25.00%	2. MRI, Lower Extremity Joint	73721	1.0	$1,016.26
	100.00%	3. X-ray Exam, Ankle-Complete	73610	1.0	$58.07
	3.00%	4. EKG	93000	1.0	$44.69
	3.00%	5. X-ray Exam, Chest-2 Views	71020	1.0	$66.37
			Subtotal, Sum of (b) x (e) x (f):		$458.72
12.50%		**II. Inpatient Therapy**			
	100.00%	1. Closed Reduction of Trimalleolar Fracture	27818	1.0	$683.93
	100.00%	2 Assistant Surgeon	27818-80	1.0	$136.79
	40.00%	3. Hospital - 1 Day - Ankle Closed Fracture	1S001	1.0	$1,026.44
	60.00%	4 OS Facility - Ankle Closed Fracture	OS001	1.0	$568.05
	100.00%	5. Anesthesia - Open Lower Leg Bone Surgery	1480	1.0	$519.53
	100.00%	6 Cast Materials, Short Leg	AP048	1.0	$75.00
			Subtotal, Sum of (b) x (e) x (f):		$2,166.66
87.50%		**III. Outpatient Therapy**			
	100.00%	1. Closed Reduction of Bimalleolar Fracture	27810	1.0	$526.10
	55.00%	2 OS Facility - Ankle Closed Fracture	OS001	1.0	$568.05
	55.00%	3. Anesthesia - Open Lower Leg Bone Surgery	1480	1.0	$519.53
	100.00%	4. Cast Materials, Short Leg	AP048	1.0	$75.00
			Subtotal, Sum of (b) x (e) x (f):		$1,199.27
100.00%		**IV. Post-Therapy Care**			
	100.00%	1. Follow-Up Visit, Post-Operative	99024	8.0	$0.00
	50.00%	2 Office/Outpatient Est Expanded Focused	99213	6.0	$51.57
	100.00%	3 X-ray Exam, Ankle-Complete	73610	5.0	$58.07
	100.00%	4 Cast Materials, Short Leg - Walking	AP049	1.0	$90.00
	50.00%	5 Ankle Brace - Air Cast	AP002	1.0	$40.00
	90.00%	6 Pain Medication	RX001	10.0	$2.88
	80.00%	7. NSAIDs	RX002	12.0	$2.40
	60.00%	8. Phys Med-Therapeutic Exercises	97110	6.0	$45.84
			Subtotal, Sum of (b) x (e) x (f):		$769.04

Total Cost, Sum of (a) x Subtotal	**$2,547.95**

Exhibit 4

Table 3d
Ankle Injuries - Optimally Managed
Fractures and Dislocations

Surgery by Specialist

Ankle Injuries :	4.23%	of Lost Work Day Cases	**Charge Basis**	
Fractures and Dislocations :	11.50%	of Ankle Injuries	Example Fee Schedule	
Surgery by Specialist :	25.00%	of Ankle Fractures and Dislocations	Center Date: 7/1/96	

Treatment Probabilities (a) Treatment % of Total	(b) Procedure % of (a)	(c) Course of Treatment	(d) Procedure Code	(e) Number of Services	(f) Price Per Service
100.00%		**I. Pre-Surgery Care**			
	100.00%	1. ER Visit Severe Mod Complex	99284	1.0	$143.25
	25.00%	2. MRI, Lower Extremity Joint	73721	1.0	$1,016.26
	15.00%	3. EKG	93000	1.0	$44.69
	15.00%	4. X-ray Exam, Chest-2 Views	71020	1.0	$66.37
			Subtotal, Sum of (b) x (e) x (f):		$413.97
60.00%		**II. Bimalleolar Fracture**			
	100.00%	1. Open Treatment of Bimalleolar Fracture	27814	1.0	$1,315.25
	100.00%	2. Assistant Surgeon	27814-80	1.0	$263.05
	100.00%	3. *Anesthesia - Open Lower Leg Bone Surgery*	1480	1.0	$519.53
	60.00%	4. OS Facility - Ankle Open Fracture	OS002	1.0	$568.05
	40.00%	5. Hospital - 1 Day - Ankle Open Fracture	IS002	1.0	$1,026.44
	100.00%	6. Cast Materials, Short Leg	AP048	1.0	$75.00
			Subtotal, Sum of (b) x (e) x (f):		$2,924.24
40.00%		**III. Trimalleolar Fracture**			
	100.00%	1. Open Treatment of Trimalleolar Fracture	27822	1.0	$1,525.69
	100.00%	2 Assistant Surgeon	27822-80	1.0	$305.14
	100.00%	3. Anesthesia - Open Lower Leg Bone Surgery	1480	1.0	$519.53
	50.00%	4. Hospital - 1 Day - Ankle Open Fracture	IS002	1.0	$1,026.44
	50.00%	5. OS Facility - Ankle Surgery - 23 hour	OS027	1.0	$568.05
	100.00%	6. Cast Materials, Short Leg	AP048	1.0	$75.00
			Subtotal, Sum of (b) x (e) x (f):		$3,222.61
100.00%		**IV. Post-Surgery Care**			
	100.00%	1. Follow-Up Visit, Post-Operative	99024	6.0	$0.00
	45.00%	2. Office/Outpatient Est Expanded Focused	99213	4.0	$51.57
	100.00%	3. X-ray Exam, Ankle-Complete	73610	4.0	$58.07
	100.00%	4. Cast Materials, Short Leg - Walking	AP049	1.0	$90.00
	50.00%	5. Ankle Brace - Air Cast	AP002	1.0	$40.00
	100.00%	6. Pain Medication	RX001	12.0	$2.88
	90.00%	7. NSAIDs	RX002	15.0	$2.40
	30.00%	8. Antibiotics	RX005	7.0	$6.84
	15.00%	9. Hardware Removal - Deep	20680	1.0	$420.88
	15.00%	10. OS Facility - Removal of Hardware	OS040	1.0	$654.61
	10.00%	11. Anesthesia	1999	1.0	$349.50
	90.00%	12. Phys Med-Therapeutic Exercises	97110	8.0	$45.84
	10.00%	13. Therapeutic Activities-Each 15 Min	97530	12.0	$28.65
			Subtotal, Sum of (b) x (e) x (f):		$1,077.13

Total Cost, Sum of (a) x Subtotal	**$4,534.69**

Exhibit 5

Current System vs. Pilot

	WSF Current System	Pilot Project MCOs
Risk-sharing	None (except hospital DRGs)	At risk for WC medical costs
Consumer Choice	Worker has total freedom	Restricted to network
Provider Contracting	Do business with any licensed provider	Contract with Occ Med Physicians and other needed providers
Care Team Design	Varies by provider -- numerous approaches	Physicians & Nurses with Occ Med expertise
Case Management	Narrow range diagnoses	Broader range diagnoses
Disability Management (RTW)	Inconsistent approach, sometimes with multiple managers	More consistent, systematic approach, directed by Occ Med physicians
Knowledge of Worksite	Tends to be second hand	More emphasis on first hand
Utilization Management	UR company focuses on inpatient hospital and some outpatient surgeries	Able to focus on both inpatient and a broader range of outpatient services
Quality Assurance	To be cost-effective, Peer Review company targets outlier physicians only	By limiting network size MCO is able to track more than just outliers

Exhibit 6

Relationship between Cap Rate and Medical Premium

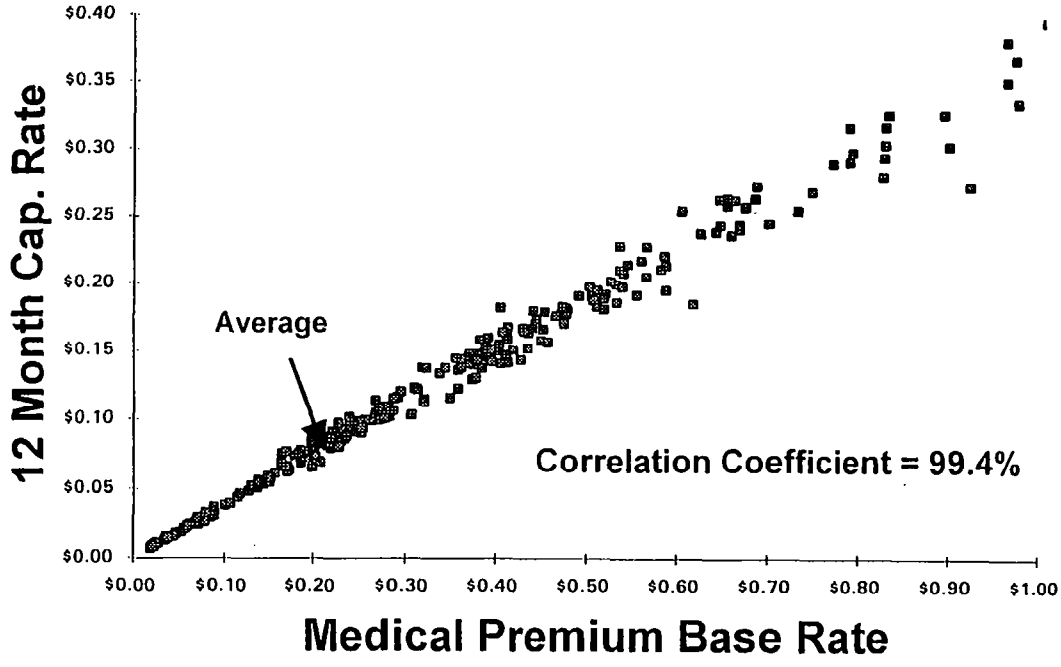

Exhibit 7

Expected 3 Year Capitated MCO Losses

1)	Earned premium subject to MCO program	$15,000,000
2)	Expected loss ratio	75%
3)	Expected losses (1) x (2)	$11,250,000
4)	Ground-up medical losses to total loss ratio	50%
5)	Expected medical losses (3) x (4)	$5,625,000
6)	Medical excess loss pure premium factor at $100,000	28%
7)	Expected limited medical losses (5) x [1.0 - (6)]	$4,050,000
8)	Expected percentage of limited medical losses paid within 3 years of occurrence	80%
9)	Expected MCO medical losses (7) x (8)	$3,240,000

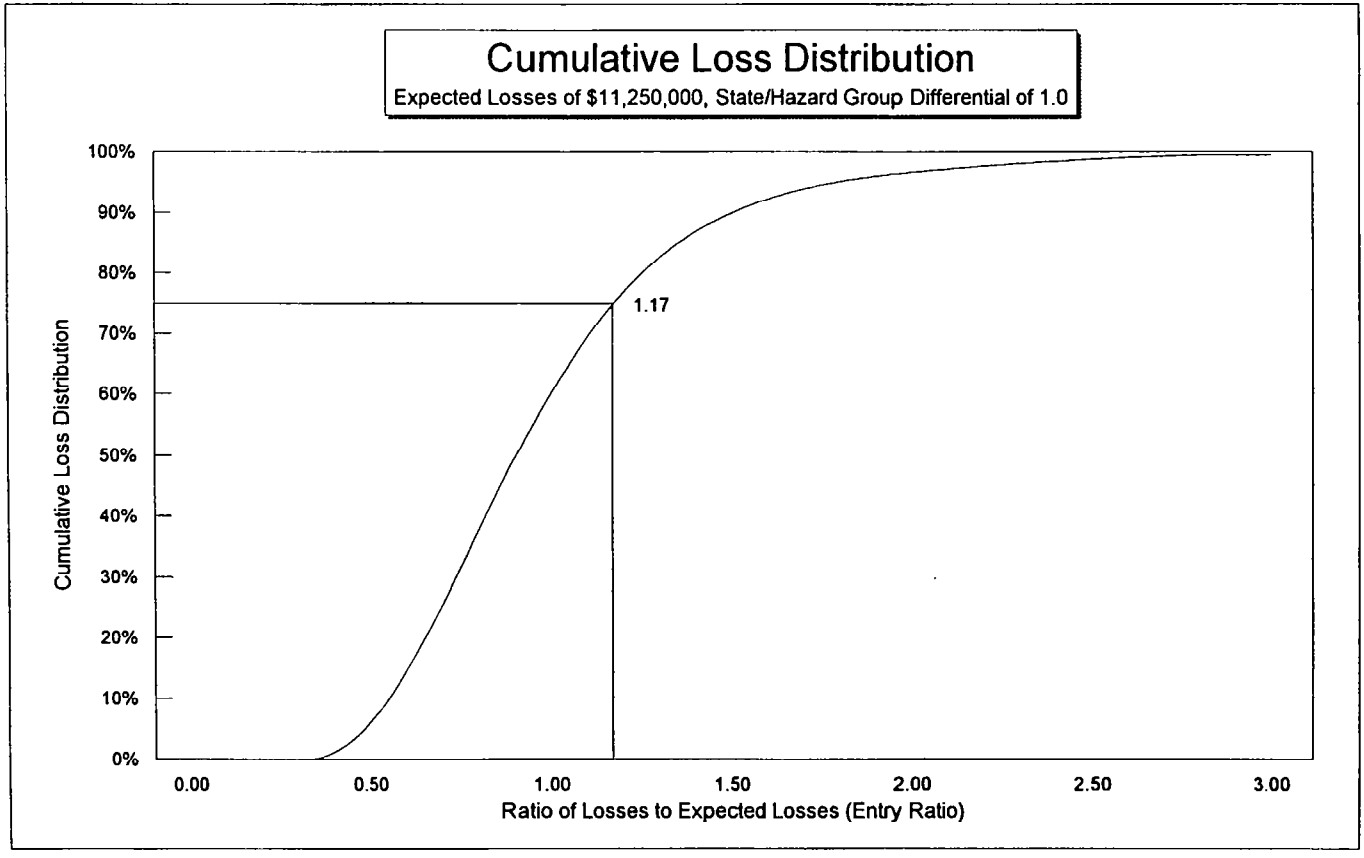
Cumulative Loss Distribution
Expected Losses of $11,250,000, State/Hazard Group Differential of 1.0
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Loss Distribution
1.17
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Ratio of Losses to Expected Losses (Entry Ratio)

Exhibit 9

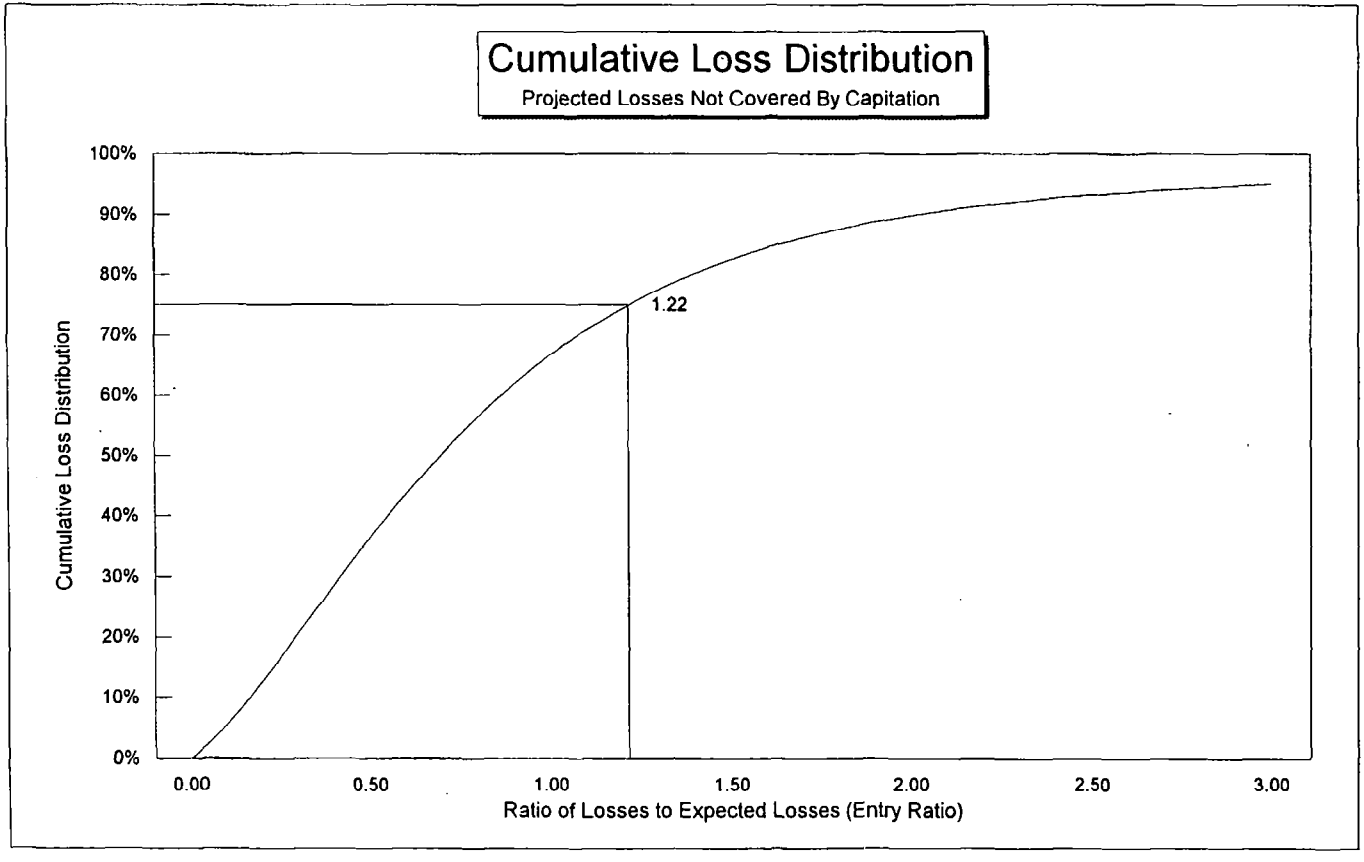
Cumulative Loss Distribution
Projected Losses Not Covered By Capitation
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Cumulative Loss Distribution
1.22
0.00
0.50
1.00
1.50
2.00
2.50
3.00
Ratio of Losses to Expected Losses (Entry Ratio)

Exhibit 10

LOSS RATIO DIVIDEND PLAN

1) *Assumptions*

- Projected loss ratio for prospective period based on trending and developing prior years' claim costs and comparing to premium at current rate level is: 75%

- Earned premium subject to MCO program: $100,000,000

- Claim costs above $100,000 are excluded from the dividend plan.
  Expected cost of losses above $100,000[1]: .184

- Expected Reporting Pattern at 12 months: 50%
  24 months: 75%
  36 months: 80%
  48 months: 90%

- Calculations performed
  at 36 months and
  30% of the savings
  returned to MCO

- Actual reported losses at 36 months = $45,000,000

[1] *PCAS Volume LXXVIII 1991; Retrospective Rating: Excess Loss Factors*, William R. Gillam, Pages 1-40

Exhibit 11

LOSS RATIO DIVIDEND PLAN

2)	*Dividend Calculation*	
1)	Earned Premium	$100,000,000
2)	Target Loss Ratio	75%
3)	Expected Ultimate Losses (1)x(2)	75,000,000
4)	Excess Ratio	.184
5)	Expected Ultimate Limited Losses (3)x(1-4)	61,200,000
6)	Expected Percentage of Losses Reported	.80
7)	Expected Limited Losses Reported	48,960,000
	36 months after the beginning of the accident year (5)x(6)	
8)	Actual Reported Losses	45,000,000
9)	MCO Savings (7)-(8)	3,960,000
10)	Dividend Sharing Percentage	30%
11)	Dividend Due MCO	1,188,000