EDUCATION AND EXAMINATION COMMITTEE

OF THE

SOCIETY OF ACTUARIES

COURSE 8 HEALTH, GROUP LIFE, AND MANAGED CARE STUDY NOTE

COURSE 8 HEALTH, GROUP LIFE, AND MANAGED CARE CASE STUDY

MANAGED CARE EXTENSION

The Education and Examination Committee provides study notes to persons preparing for the examinations of the Society of Actuaries. They are intended to acquaint candidates with some of the theoretical and practical considerations involved in the various subjects. While varying opinions are presented where appropriate, limits on the length of the material and other considerations sometimes prevent the inclusion of all possible opinions. These study notes do not, however, represent any official opinion, interpretations or endorsement of the Society of Actuaries or its Education and Examination Committee. The Society is grateful to the authors for their contributions in preparing the study notes.

8M-13-04 **Printed in U.S.A.**

MANAGED CARE EXTENSION

I. MANAGED CARE DIVISION

The Managed Care division of Wonderful Life Insurance Company includes a single location managed care organization (MCO), The Bedford Group. The Bedford Group provides both point-of-service (POS) and health maintenance organization (HMO) products.

The Bedford Group attempts to provide the best managed care for its insureds at the least possible cost. The organization recognizes that it is in a competitive marketplace and needs to maintain good relations with providers. Provider contracts are renewed each year and have been in place as described for the most recent three-year period. The Bedford Group has contracted with three hospitals and three individual physician associations (IPAs) to provide coverage. The MCO membership has always included only commercial group business; there are no Medicare or Medicaid members.

The Bedford Group has contracted with the following providers:

- Hospital ID 1 – Managed care in-network hospital
- Hospital ID 2 – Tertiary care hospital for more intensive diagnoses
- Hospital ID 3 – Out-of-network hospital.

- IPA 1 – In-network physician services with both primary care physicians (PCPs) and specialty care physicians (SCPs) services covered and admitting privileges at Hospital 1 only;
- IPA 2 – Exclusively in-network specialty referral services with admitting privileges at both Hospital 1 and Hospital 2;
- IPA 3 – Out-of-network physician services with admitting privileges at all hospitals.

Prescription drugs are administered through a Prescription Benefit Management (PBM) Company but The Bedford Group maintains the risk on the drug benefit.

All hospital outpatient services are performed at each hospital. The Bedford Group has no disease management programs but does provide case management and utilization review.

All numbers found in this case study are for illustration only and may not be representative of true costs or actual relationships. Any similarities with actual company results are purely coincidental.

Financial and Utilization Data

The most recent three years of experience for The Bedford Group are illustrated in Table MC-1. Premium revenue and expenses include all HMO and POS business. Claims

expense includes paid claims, the change in incurred but not reported (IBNR) claim liabilities and the change in provider liabilities. General expense includes division expenses and corporate overhead allocated to the product line. Investment income includes earnings on the assets that support the business as well as earnings on operating income.

Premium income over the last two years has grown at an annual rate of over 8% per year over the entire period. Higher than anticipated incurred claims contributed to a negative operating margin in 2001 and 2002. However, the medical loss ratio has been decreasing and total expenses have been stable as a percentage of premium over this time period. Therefore, operating margins have been improving. Investment income has fluctuated during the three years shown in Table MC-1. Operating income both pre- and post-tax has also been increasing over the past two years.

Total inpatient days and admissions per 1,000 members for 2001 through 2003 by type of service are shown in Table MC-2. The distribution of days and admissions by hospital is also shown. Utilizations include those experienced by both HMO and POS members.

Table MC-3 illustrates total incurred claims by type of service and by product for the past three years. Incurred claims are shown gross of any provider risk or provider profit sharing payments. Incurred claims are shown net of member cost sharing (i.e., copayments, deductibles and coinsurance).

Table MC-4 illustrates the 2004 budgeted utilization per 1,000 members by service type as compared to 2003 actual utilization. Services per 1,000 members in each year are based on incurral dates.

Services by type per 1,000 members and associated per member per month (PMPM) physician costs for the past three years are shown separately in Table MC-5 for both PCPs and SCPs by service type. The distribution of physician services by IPA is also illustrated. For both PCPs and SCPs, the mix of services is assumed to be the same across all IPAs. Services and PMPM costs reflect the combined experience of both the HMO and POS products.

The past three years' administrative expenses for the HMO and POS products are illustrated in Table MC-6. The Bedford Group has long-term leases or fixed mortgages on administration and facilities. Average commission expenses and premium taxes are calculated as a percent of premium and are included separately. Corporate functions include overhead costs for the finance, actuarial, underwriting, legal, and executive departments. The Management Information Systems (MIS) and Information Technology (IT) departments experienced an unusual expense increase in 2003 due to system upgrades.

Provider Contract Provisions

The provisions of The Bedford Group's provider contracts are outlined in Table MC-7. The Bedford Group uses a combination of reimbursement methods, depending on the

provider. All admissions for Hospital ID 1 are reimbursed on either a per diem or per case basis. Hospital ID 2 admissions are reimbursed at a day 1 level per diem rate with lower per diem rates for days 2 and greater. The Bedford Group has contracted for a straight 20% discount off charges for all admissions at Hospital ID 3.

The Bedford Group also uses a variety of reimbursement methods for emergency room and outpatient hospital surgery. Emergency room services at both Hospital ID 1 and Hospital ID 2 are reimbursed on a flat per case basis, although the amount per case varies for Hospital ID 2, depending upon the case level. Outpatient surgeries are reimbursed on a per case basis for Hospital ID 1 and are based on either a discount off charges (for services without a published Medicare Ambulatory Surgical Center (ASC) payment) or a factor applied to the Medicare ASC schedule for Hospital ID 2. Radiology, pathology, and other outpatient services are reimbursed on a discount off charges basis for Hospital ID 1 and Hospital ID 2. All hospital outpatient services (including emergency room and outpatient surgeries) are reimbursed to Hospital ID 3 on a straight discount off charges basis.

All physicians are reimbursed based on a contracted percentage of the 2002 Medicare Resource Based Relative Value Scale (RBRVS) schedule. The percentage varies by IPA group.

The Prescription Benefit Management (PBM) Company has provided The Bedford Group with separate discounts off the Average Wholesale Price (AWP) for single source brand, multi-source brand, and generic drugs. The distribution of scripts and percent of drugs on formulary as well as other pharmacy fees charged by the PBM and average rebate amounts are outlined in Table MC-7. The Bedford Group does not currently offer a mail order prescription drug service through the PBM.

Provider Risk Share Arrangements

The Bedford Group has provider risk share arrangements in place with Hospital ID 1, Hospital ID 2, IPA 1, and IPA 2. Descriptions of the arrangements for year 2004 are provided in Table MC-8.

Hospital ID 1 shares in The Bedford Group's financial risk for the HMO and POS products. The Bedford Group has established a combined inpatient and outpatient PMPM target cost of $35.00 for Hospital ID 1. The risk corridor on the contract is +/- 5%. That is, if the ultimate incurred combined PMPM falls within the range of $33.25 ($35.00 x 0.95) to $36.75 ($35.00 x 1.05), Hospital ID 1 receives no additional payments beyond the original contracted levels and does not return any of the payments already received to The Bedford Group. However, if the ultimate incurred combined PMPM falls outside the range of the risk corridor, Hospital ID 1 will share equally with The Bedford Group in the difference between the ultimate PMPM level and the applicable high or low end of the range. Hospital ID 1's risk share exposure is capped at 10% of the target PMPM outside of the risk corridor range.

The Bedford Group has a bonus pool contract with Hospital ID 2. Outpatient services and Skilled Nursing Facility (SNF) admissions are excluded from the bonus pool calculations. The target average length of stay (LOS) for Hospital ID 2 is 7.0 days in 2004. If the actual LOS experienced in 2004 is greater than the target LOS, Hospital ID 2 does not receive a bonus pool payout (but also is not required to return any of the payments already received). If the actual LOS is less than the target LOS, The Bedford Group pays a bonus amount to Hospital ID 2, based on the formula specified in Table MC-8.

IPA 1 is subject to a provider withhold arrangement. Providers are initially paid at 90% of the contracted levels (a 10% withhold). The target combined PCP and SCP PMPM incurred claim level is $38.00 in 2004. If the ultimate incurred PMPM level is less than the target level, the entire withhold is returned to the provider group. If the ultimate incurred PMPM level is greater than the target level, the withheld amount is applied to offset the difference. Any remaining withheld amount is returned to the provider group once The Bedford Group has been "reimbursed" for any claims expenses over the target PMPM level.

IPA 2 is subject to a bonus pool arrangement. The target incurred PMPM claim level is $25.00 in 2004. If the actual ultimate incurred PMPM claim level is greater than the target level, IPA 2 does not receive any additional compensation over the original contracted levels. If the actual ultimate incurred PMPM claim level is less than the target level, The Bedford Group pays IPA 2 a bonus equal to the lesser of 10% of the target PMPM or 50% of the difference between the target and the actual PMPM.

TABLE MC-1
THREE YEAR FINANCIAL STATEMENT FOR THE MANAGED CARE DIVISION
(Amounts in $1,000s)

	2001	% of Premium	2002	% of Premium	2003	% of Premium
Premium Income	**$426,300**		**$427,900**		**$499,500**	
Paid Claims	$387,300	90.9%	$382,600	89.4%	$421,600	84.4%
Change in IBNR	$1,600	0.4%	$300	0.1%	$13,700	2.7%
Total Incurred Claims	$388,900	91.2%	$382,900	89.5%	$435,300	87.1%
Change in Provider Liabilities	$300	0.1%	($100)	0.0%	$300	0.1%
Claims Expense	**$389,200**	**91.3%**	**$382,800**	**89.5%**	**$435,600**	**87.2%**
Gross Margin	**$37,100**	**8.7%**	**$45,100**	**10.5%**	**$63,900**	**12.8%**
General Administrative Expense	$36,400	8.5%	$36,000	8.4%	$42,000	8.4%
Commissions	$10,700	2.5%	$10,700	2.5%	$12,500	2.5%
Premium Tax	$300	0.1%	$300	0.1%	$300	0.1%
Total Expense	**$47,400**	**11.1%**	**$47,000**	**11.0%**	**$54,800**	**11.0%**
Operating Margin	**($10,300)**	**-2.4%**	**($1,900)**	**-0.4%**	**$9,100**	**1.8%**
Investment Income	$4,200	1.0%	$9,100	2.1%	$6,900	1.4%
Other Income	$100	0.0%	$0	0.0%	$100	0.0%
Operating Earnings Before Taxes	**($6,000)**	**-1.4%**	**$7,200**	**1.7%**	**$16,100**	**3.2%**
Taxes	($2,300)	-0.5%	$2,700	0.6%	$6,100	1.2%
Operating Earnings After Taxes	**($3,700)**	**-0.9%**	**$4,500**	**1.1%**	**$10,000**	**2.0%**

TABLE MC-2
INPATIENT UTILIZATION SUMMARY BASED ON INCURRAL DATES

	Hospital ID 1			Hospital ID 2			Hospital ID 3			Total		
	2001	2002	2003	2001	2002	2003	2001	2002	2003	2001	2002	2003
Hospital Inpatient Days per 1,000 Members												
Medical	75.0	90.0	70.0	35.0	20.0	30.0	15.0	10.0	20.0	125.0	120.0	120.0
Surgical	60.0	60.0	60.0	30.0	25.0	20.0	15.0	15.0	10.0	105.0	100.0	90.0
Psychiatric	-	-	-	18.0	15.0	15.0	28.0	25.0	30.0	46.0	40.0	45.0
Alcohol & Drug Abuse	2.0	3.0	2.0	10.0	8.0	12.0	1.0	2.0	1.0	13.0	13.0	15.0
Maternity	20.0	35.0	30.0	10.0	8.0	4.0	-	2.0	4.0	30.0	45.0	38.0
Skilled Nursing Care	4.0	4.0	5.0	6.0	5.0	5.0	-	-	-	10.0	9.0	10.0
Total Inpatient Days	161.0	192.0	167.0	109.0	81.0	86.0	59.0	54.0	65.0	329.0	327.0	318.0
Hospital Inpatient Admissions per 1,000 Members												
Medical	19.0	22.0	20.0	4.5	4.0	3.5	3.2	2.5	3.5	26.7	28.5	27.0
Surgical	11.0	13.0	14.0	2.5	2.3	2.0	3.2	2.8	2.0	16.7	18.1	18.0
Psychiatric	-	-	-	1.2	1.4	1.5	2.2	1.8	2.0	3.4	3.2	3.5
Alcohol & Drug Abuse	0.5	0.6	0.4	0.9	0.5	1.0	0.5	0.6	0.6	1.9	1.7	2.0
Maternity	8.0	13.5	13.0	3.0	2.8	1.5	-	0.6	1.0	11.0	16.9	15.5
Skilled Nursing Care	0.5	0.4	0.5	0.4	0.3	0.2	-	-	-	0.9	0.7	0.7
Total Hospital Admissions	39.0	49.5	47.9	12.5	11.3	9.7	9.1	8.3	9.1	60.6	69.1	66.7
Hospital Outpatient Cases per 1,000 Members												
Emergency Room	90.0	100.0	100.0	50.0	50.0	60.0	35.0	40.0	40.0	175.0	190.0	200.0
Surgery	65.0	80.0	85.0	10.0	12.0	15.0	10.0	8.0	10.0	85.0	100.0	110.0

TABLE MC-3
SUMMARY OF INCURRED CLAIMS *
(Amounts in $1,000s)

	HMO Product			*Point-of-Service Product*		
	2001	**2002**	**2003**	**2001**	**2002**	**2003**
Hospital Inpatient	$33,200	$33,500	$33,600	$62,400	$56,400	$62,200
Hospital Outpatient	$24,200	$25,400	$28,200	$44,000	$42,000	$52,200
Primary Care Physicians	$11,600	$12,700	$14,600	$16,400	$15,900	$20,100
Specialty Physicians	$56,700	$59,600	$62,700	$96,800	$91,500	$104,600
Other Ancillary	$1,800	$1,800	$2,000	$3,500	$3,400	$3,900
Prescription Drugs	$13,400	$14,900	$17,400	$24,900	$25,800	$33,800
Total	$140,900	$147,900	$158,500	$248,000	$235,000	$276,800
Average Monthly Members	75,000	77,000	80,000	125,000	115,000	130,000

* Payments are net of member cost sharing and gross of provider risk or profit sharing.

TABLE MC-4
SUMMARY OF UTILIZATION PER 1,000 MEMBERS *

Benefit Category	*2003 Actual*	*2004 Budget*
Hospital Inpatient		
Medical	120 Days	115 Days
Surgical	90 Days	85 Days
Psychiatric	45 Days	35 Days
Alcohol & Drug Abuse	15 Days	15 Days
Maternity	38 Days	30 Days
Skilled Nursing Care	10 Days	10 Days
Total Inpatient Days	318 Days	290 Days
Hospital Outpatient		
Emergency Room	200 Cases	180 Cases
Surgery	110 Cases	120 Cases
Radiology	230 Cases	200 Cases
Laboratory	250 Cases	200 Cases
Other Outpatient Services	150 Services	100 Services
Primary Care Physician		
Outpatient Surgery	90 Proced.	80 Proced.
Inpatient Visits	140 Visits	135 Visits
Office Visits	2,150 Visits	2,000 Visits
Well Baby Exams	70 Exams	100 Exams
Routine Physical Exams	500 Exams	500 Exams
Specialty Physician		
Inpatient Surgery	40 Proced.	45 Proced.
Outpatient Surgery	360 Proced.	320 Proced.
Anesthesia	90 Proced.	80 Proced.
Maternity	15 Cases	20 Cases
Inpatient Visits	100 Visits	90 Visits
Emergency Room Visits	180 Visits	150 Visits
Office Visits	1,160 Visits	1,100 Visits
Physical Medicine	650 Services	600 Services
Radiology	1,200 Proced.	1,000 Proced.
Laboratory	2,625 Proced.	2,250 Proced.
Vision, Hearing, Speech Exams	400 Exams	325 Exams
Outpatient Psychiatric & Sub Abuse	600 Visits	550 Visits
Chiropractor	900 Visits	700 Visits
Podiatrist	60 Visits	50 Visits
Other Medical	550 Proced.	500 Proced.
Other Ancillary		
Home Health	45 Visits	30 Visits
Ambulance	10 Runs	20 Runs
DME/Prosthetics	90 Units	100 Units
Prescription Drugs	7,200 Scripts	7,000 Scripts

* Based on incurral date. The incurral date is defined as the date of admission for inpatient claims and the date of service for outpatient or physician claims.

TABLE MC-5
SUMMARY OF AVERAGE PMPM COST FOR PHYSICIAN SERVICES (1)

	Services per 1000 Members			*PMPM cost*		
	2001	2002	2003	2001	2002	2003
Primary Care Physician Services						
Outpatient Surgery	85	95	90	$1.42	$1.66	$1.65
Inpatient Visits	160	150	140	$1.00	$0.94	$0.93
Office Visits	1,950	2,080	2,150	$6.50	$6.93	$8.06
Well Baby Exams	75	65	70	$0.31	$0.27	$0.29
Routine Physical Exams	450	480	500	$2.44	$2.60	$2.92
Total PCP	2,720	2,870	2,950	$11.67	$12.40	$13.85
Specialty Physician Services						
Inpatient Surgery	45	43	40	$5.78	$5.66	$5.50
Outpatient Surgery	300	330	360	$10.00	$11.55	$13.20
Anesthesia	118	100	90	$4.52	$4.00	$3.90
Maternity	16	13	15	$1.53	$1.26	$1.50
Inpatient Visits	112	108	100	$0.70	$0.68	$0.67
Emergency Room Visits	140	200	180	$1.11	$1.67	$1.35
Office Visits	1,050	1,120	1,160	$3.50	$3.73	$4.35
Physical Medicine	530	630	650	$3.53	$4.20	$4.06
Radiology	1,245	1,230	1,200	$8.92	$9.02	$8.50
Laboratory	2,870	2,680	2,625	$10.28	$9.83	$8.75
Well Baby Exams	0	0	0	$0.00	$0.00	$0.00
Routine Physical Exams	0	0	0	$0.00	$0.00	$0.00
Vision, Hearing, Speech Exams	340	380	400	$1.08	$1.20	$1.33
Outpatient Psychiatric & Sub Abuse	580	610	600	$3.87	$4.07	$4.00
Chiropractor	860	740	900	$2.72	$2.34	$3.00
Podiatrist	64	65	60	$0.45	$0.47	$0.42
Other Medical	585	590	550	$5.95	$5.90	$5.96
Total SCP	8,855	8,839	8,930	$63.94	$65.58	$66.49
Total All	11,575	11,709	11,880	$75.61	$77.98	$80.34

Physician Utilization by IPA in Current Year (2)	IPA 1	IPA 2	IPA 3
PCP Utilization	95%	0%	5%
SCP Utilization	45%	40%	15%

(1) Based on incurral dates. The incurral date is defined as the date of admission for inpatient claims and the date of service for outpatient or physician claims.
(2) Average relative value units (mix of professional services) by PCP are assumed to be the same for all PCPs and similarly for SCPs.

TABLE MC-6
THREE YEAR ADMINISTRATIVE EXPENSES

	Group Experience					
	HMO			**POS**		
	2001	2002	2003	2001	2002	2003
Average Monthly Members	75,000	77,000	80,000	125,000	115,000	130,000
Annual Expenses (in $1,000s)						
Administration & Facilities (1)	$400	$400	$500	$700	$700	$800
Billing and Enrollment	$600	$600	$600	$900	$800	$1,000
Claims	$2,200	$2,300	$2,500	$3,700	$3,800	$4,400
Corporate (2)	$3,300	$3,600	$3,900	$5,700	$5,500	$6,600
Customer Service	$1,800	$1,800	$1,800	$3,000	$2,700	$3,000
MIS & IT (3)	$1,700	$1,800	$2,200	$2,800	$2,600	$3,500
Network Development	$1,300	$1,300	$1,400	$2,200	$2,100	$2,400
Sales & Marketing	$1,000	$1,100	$1,400	$1,700	$1,400	$1,800
UM/CM/Disease Management	$1,400	$1,500	$1,700	$2,000	$2,000	$2,500
Total Expenses (Excluding Commissions, Premium Tax, and Margin) (4)	$13,700	$14,400	$16,000	$22,700	$21,600	$26,000
Average Commissions Percentage	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%
Premium Tax Percentage	0.25%	0.25%	0.25%	1.00%	1.00%	1.00%
Margin & Contingency	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%

(1) Administration and facilities have long term leases or fixed mortgages.
(2) Corporate functions include finance, actuarial, underwriting, legal, and executive departments.
(3) Systems had an unusual increase in 2003 due to system upgrades.
(4) Average commissions, premium tax, and margin are determined as a percent of premium and included separately.

TABLE MC-7
PROVIDER CONTRACT MATRIX
CONTRACTS IN EFFECT FOR 2001, 2002, AND 2003

Hospital Inpatient	*Type of Admission*					
	Medical	**Surgical**	**Psychiatric**	**Substance Abuse**	**Maternity**	**Skilled Nursing**
Hospital ID 1	Per Diem: $1,200	Per Diem: $1,500	N/A	Per Diem: $600	Per Case: $2,200	Per Case: $600
Hospital ID 2	Day 1 Per Diem: $1,800 Day 2+ Per Diem: $1,200	Day 1 Per Diem: $4,000 Day 2+ Per Diem: $1,500	Per Diem: $1,000	Per Diem: $1,000	Day 1 Per Diem: $1,500 Day 2+ Per Diem: $1,000	Per Diem: $700
Hospital ID 3	Discount: 20%	Discount: 20%	Discount: 20%	Discount: 20%	Discount: 20%	Discount: 20%

Hospital Outpatient	**Emergency Room**	**Surgery**	**Radiology**	**Pathology**	**Other**
Hospital ID 1	Per Case: $300	Per Case: $1,500	Discount: 20%	Discount: 20%	Discount: 20%
Hospital ID 2	Level 1: $200 Per Case Level 2: $500 Per Case Level 3: $1,000 Per Case	150% of Medicare ASCs Discount: 30% for Non-ASC services	Discount: 20%	Discount: 20%	Discount: 20%
Hospital ID 3	Discount: 20%	Discount: 20%	Discount: 20%	Discount: 20%	Discount: 20%

Physician Group	**All Physician Services**
IPA 1	120% of 2002 Medicare RBRVS
IPA 2	135% of 2002 Medicare RBRVS
IPA 3	150% of 2002 Medicare RBRVS

Prescription Drugs	**Discount**	**Percent of Scripts**	**Percent on Formulary**	**Dispensing Fee**	**Admin Fee**	**Average Rebates**
Generic	AWP less 75%	40%	100%	$2.00/script	$.50/script	Formulary = $.75/script Non-Formulary = None
Single Source Brand	AWP less 10%	45%	70%	$2.00/script	$.50/script	
Multi-Source Brand	AWP less 40%	15%	85%	$2.00/script	$.50/script	

TABLE MC-8
PROVIDER RISK SHARE ARRANGEMENTS

Hospital Risk Arrangement

Hospital ID 1	*Risk Share*
	Inpatient and outpatient combined target rate, PMPM = $ 35.00 for POS and HMO products Risk corridor = +/- 5% No risk sharing inside risk corridor Percent risk share outside risk corridor = 50% Maximum risk share = Maximum payment is 10% of the target PMPM outside the risk corridor

Hospital ID 2	*Bonus Pool Only*
	No profit share for outpatient services or SNF admissions Profit share criteria: Target average length of stay = 7.0 days Profit share formula: Paid only if actual LOS < target LOS, otherwise no payout Amount paid based on average of 2nd day and later per diems Formula = (target LOS - actual LOS) x (average 2nd day per diem) x members/1000 x admits/1000

Hospital ID 3	*None*

Physician Risk Arrangements

IPA 1	*Withhold*
	Amount of withhold = 10% of paid claims Target combined PCP and SCP claim rate = $ 38.00 PMPM The withhold amount is retained by the MCO until the target PMPM is met and any excess is returned to IPA 1. If the experienced PMPM is < target PMPM, then the entire withhold is returned to IPA 1.

IPA 2	*Bonus Pool Only*
	Target SCP claim rate = $ 25.00 PMPM Profit share formula if target PMPM>actual PMPM, profit share = Min{10% of target PMPM; 50%*(target PMPM - actual PMPM)} if target PMPM<actual PMPM, profit share = $0

IPA 3	*None*