

Moving From Disease Management to Population Health Management

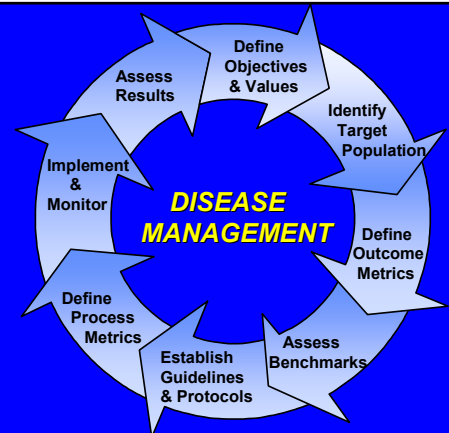
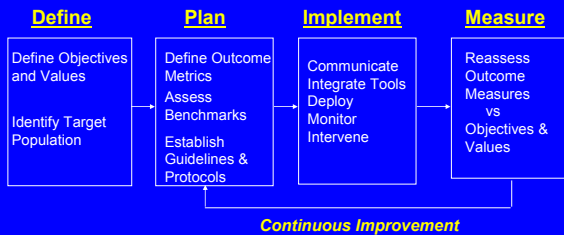
Marc L. Berger, M.D.
Vice President
Merck & Co., Inc.

USHH Outcomes Research and Management

Definition

Evidence-Based Process
to Assist Payers and Providers in
Improving Patient Outcomes
and **Manage Health Care Costs**
Using the Principles of
Total Quality Management
(Continuous Quality Improvement)

CQI/TQM Plan - Do - Check - Act



Goals of Disease Management

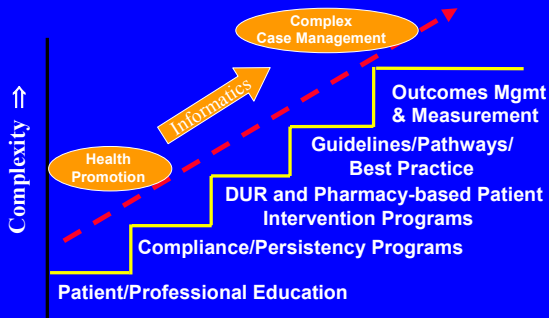
- Improve Quality of Care
 - Identify and Treat Appropriate Patients
 - Reduce Tx Variation/Facilitate Best Practices
- Improve Patient Satisfaction with Care
 - Improve outcomes important to patients
- Manage Total Cost of Health Care
 - Cost Centers (Pharm., Hosp., etc.) → Overall Cost

TOP DISEASE STATES FOR IPA AND STAFF HMO & IHS CONTRACTS WITH OUTSIDE VENDORS
FALL/WINTER 2000 THROUGH SPRING/SUMMER 2002

Fall 2000	Spring 2001	Fall 2001	Spring 2002	Disease State
1	1	1	1	Diabetes
2	2	2	2	Asthma
3	3	3	3	Depression
4	4	4	4	Congestive Heart Failure
5	6	6	5	Hyperlipidemia
9	12	8	6	Hypertension
8	11	7	7	Coronary Artery Disease
7	9	5	8	Antibiotics
6	5	10	9	Smoking Cessation
12	7	14	10	Osteoporosis
10	10	16	11	Allergic Rhinitis
NA	NA	11	12*	Menopause
13	15	12	12*	Migraine
14	14	17*	14	COPD
17	16	9	15*	Acute Myocardial Infarction
11	13	13	15*	GERD

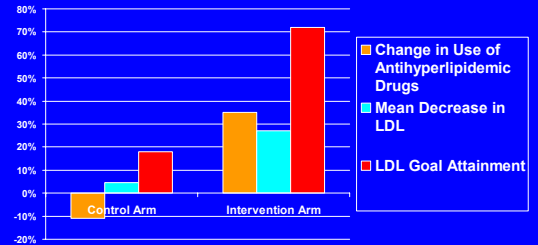
* Indicates a tie
NA= Not applicable because partnerships in this disease state were not asked about.
Source: HIRC /Health & Disease Management Services/ Fall 2000, N=122;
Spring 2001, N=120; Fall 2001, N=109; Spring 2002, N=146.

What are the Components of DM?



Outcomes at Staff Model MCO CHD Disease Management Program Results

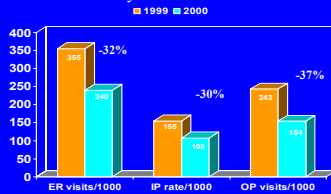
- Population identified through integrated claims, lab, pharmacy data
- Pharmacy-based Intervention (MD notification and follow-up)
- Results assessed at 1 year & 2 years



P. Nebenfuhr, K. Jungkind, M. Berger, *Disease Management*, 4:173-178, 2001.

Outcomes at Medicaid-contracted HMO Asthma Disease Management Program Results

- DM components included provider and patient mailings, group classes, case management, and ATAQ (Asthma Therapy Assessment Questionnaire) software
- 4,200 target population of asthmatics, 43% pediatric
- Results assessed at 1 year

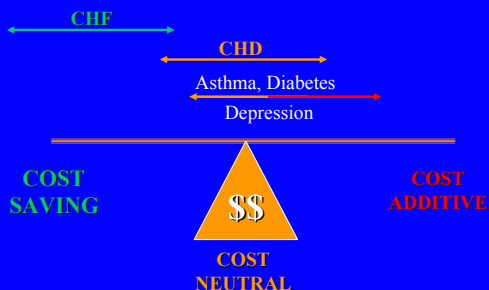


P. Nebenfuhr, K. Jungkind, M. Berger, *Disease Management*, 4:173-178, 2001.

Current Disease Management

- Disease/Condition Focused
- Major Components
 - Patient Education / Self-Management
 - Messages / Reminders
 - Case Management
- Evaluation Generally Weak
 - Health Outcomes
 - Financial Outcomes

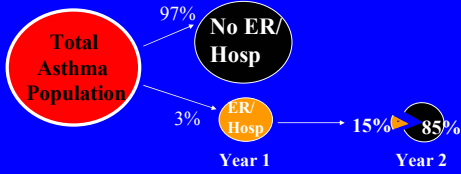
Disease Management and Cost Containment



Why don't we know if many DM programs save money?

- Most documentation in trade rather than peer-reviewed literature
- Most common approach is to focus on severe patients -- leads to overestimate of cost savings for population
 - *assumes current resource use predicts the majority of future resource use*

Example: Asthma ID Patients by Recurrent ER/Hospital Use



- Of patients using the ER/Hospital for asthma in Year 2, only 15% had ER/Hospital use in the prior year
- 85% of patients with an asthma-related visit to an ER/Hospital in Year 2 did not use the ER/Hospital for asthma in Year 1

P. Algotz-Bergstrom, L. Markson, R. Murray, M. BERGER. A Population-Based Approach to Asthma Disease Management. *Disease Management and Health Outcomes* 2009. 13(4): 176-186.

Statistical Sleight of Hand “Regression to the Mean”

- “Patients selected because they represent an extreme value in a distribution can be expected, on average, to have less extreme values on subsequent measurements”¹ even without an intervention. (called “regression to the mean”)
- The population of asthmatics most in need of disease management may be those who have not been high resource users in the past year, but those who have had poor asthma control.

¹Clinical Epidemiology, RH Fletcher, SW Fletcher, EH Wagner, Williams & Wilkins, Baltimore, MD, 1988, page 38.

Comprehensive Vision of Disease Management (DMAA)

“A multi-disciplinary continuum-based approach to healthcare delivery that proactively identifies populations with or at risk for established medical conditions, that supports the physician/patient relationship and plan of care, emphasizes prevention of exacerbations and complications utilizing cost-effective evidence-based practice guidelines and patient empowerment strategies such as self-management, and continuously evaluates clinical, humanistic, and economic outcomes with the goal of improving overall health.”

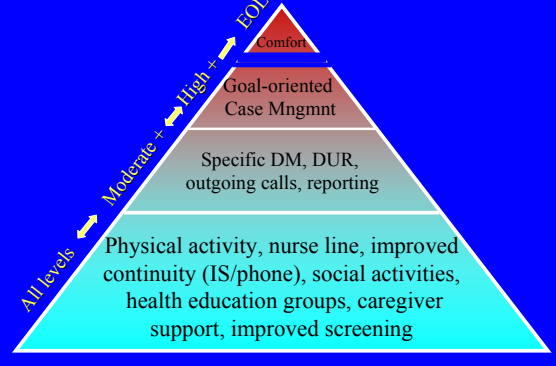
Rationale for Population-based Health Management

- Co-prevalence of Common Conditions
 - Interactions affect health outcomes and costs
- Potential Economies of Scope and Scale
 - Delivery at POC address Entire Patient
 - System development to meet particular population needs
 - Titration resource allocation
 - 10% non-institutionalized elderly population account for 75% of health care expenditures

Example: The Elderly

- Elderly suffer from high rates of chronic disease, social isolation, poor diet, lack of mobility, and sub-optimal function
- Social HMOs (1985)
 - Social, Medical Services (including home and community-based)
 - No improvement in outcomes
- Medicare Plus Choice
 - More comprehensive than FFS (prevention, drugs)
 - Fiscal Uncertainty
 - No clear improvement in outcomes

Titration of Resources by Need



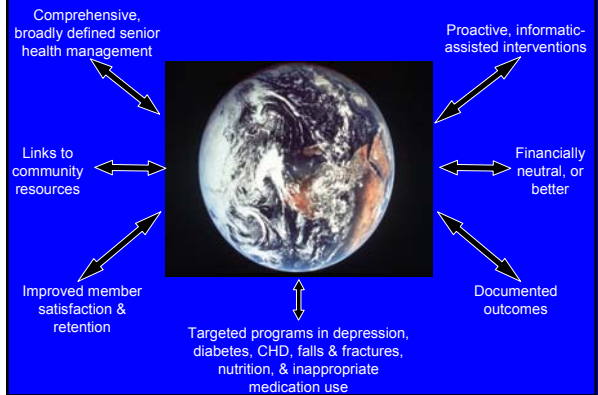
A Randomized Controlled Trial of Population-based Care Management in a Medicare Plus Choice HMO

David Martin*, Marc Berger, David Anstatt,
Jonathan Wofford*, DeAnn Warfel*, Robin
Turpin, Carolyn Cannuscio, Steve Teutsch,
Bernard Mansheim*

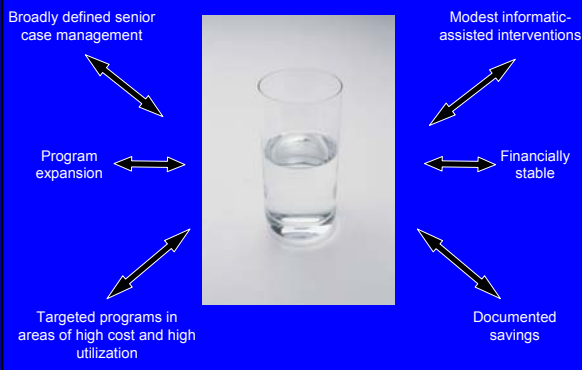
* Coventry Health Care

Project co-funded, designed, and implemented by Coventry
Health Care and Merck & Co., Inc.

Vision -- 1999



Reality -- 2002



Senior Life Management™

- Identify and monitor for risk
 - Informatics and decision support (Master Console)
 - Staffing by personal service reps, nurse coordinators, social workers, and medical director (800-1000 pts per team)
 - Integrate claims data, periodic health risk assessments
- Targeted complex case management (50-70 pts per team)
- Disease management programs
 - CHF, Falls (home safety), Nutrition
 - Depression, Diabetes
- Community physician awareness
- Coordination with community services

Study Design

- RCT with 18 month follow-up
 - Jan 2000 to June 2001
 - SLM vs Standard Medicare Plus Choice
 - Randomized by Zip Code
- All 8504 Medicare beneficiaries aged 65 and over enrolled for 12 months prior to start of study from 9-county metropolitan Pittsburgh area served by a network model plan

Outcomes

- Comparison of Baseline & 18 months
 - Survival
 - Health Status
 - Member Satisfaction
 - Costs
- Intention-to-treat
 - data analyzed for all patients until disenrollment, regardless of whether agreed to participate

Patient Assessments

- Baseline
 - 44 question HRA (SF-36 plus patient satisfaction)
 - Algorithms for complex case mgmt eligibility
 - eg 2 ER visits for diabetes control
- Ongoing
 - Q 3 Month Short Assessments
 - 18 questions
 - Changes in physical or mental health or social supports
 - Inbound Calls
- 9 and 18 Months
 - Full HRA

Program Effectiveness

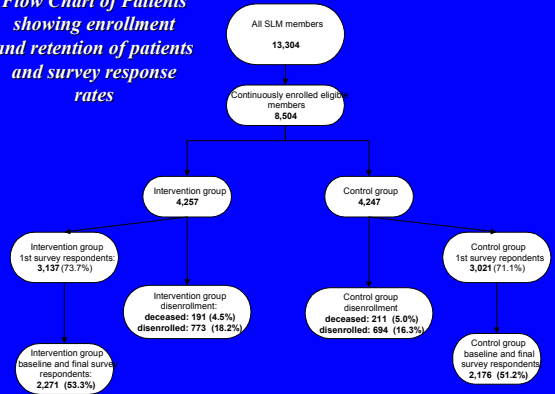
- Subset of 9 Questions from HRA were identified *a priori*
 - likely to be impacted by SLM
- Global Patient Satisfaction Question
- Health Care Resource Use and Costs
 - claims (6-month run-out permitted extraction of >98% of claims)
 - resource use: inpatient, outpatient, physician, skilled nursing and rehab, home health, durable medical equipment, all other

Baseline Demographic and Health Characteristics

Characteristic/Health Question	Study	Intervention Group (n=4257) ^a	Control Group (n=4247)	P
Age (mean (SD), years)		72.9	72.7	0.138
Male, %		51.6%	47.2%	0.040
1999 Medical claim expenditures, mean (SD), \$		1624	1626	0.406
1999 Medical claim expenditures, median, \$		922	833	
Health Characteristics				
Do you feel your health is	1 Excellent 5 Poor	2.76	2.91	0.263
Compared to one year ago, how would you rate your health in general now?	1 Much Better 5 Much Worse	2.80	2.91	0.970
If you were required assistance with daily tasks, what help would you need?	% Yes	2.03%	2.22%	0.482
Is there a friend or family member you can count on for assistance with	% Yes	97.8%	97.9%	0.769
the one you and/or the following walk all or most of the time? "none"	% Yes	16.7%	16.6%	1.362
the one you and/or the following walk all or most of the time? "with"	% Yes	2.12%	2.85%	0.518
the one you and/or the following walk all or most of the time? "someone"	% Yes	61.6%	60.1%	0.278
During the past year, how many times have you fallen to the ground?	1 None 5 5 or more	1.76	1.67	0.298
How would you rate all your experiences with health care?	1 Worst 10 Best	6.82	6.78	0.110
Chronic Illness		46.82	51.12	0.006
Heart Disease		67.66	67.04	0.766
Mental Health		70.11	70.02	0.939
Physical Function		11.24	10.76	0.046
Role Limitation - Emotional		31.11	30.98	0.846
Role Limitation - Physical		46.71	46.21	0.846
Social Function		34.37	34.41	0.968
Vitals		99.73	99.68	0.952
Medical Comorbidity - Summary Score		17.08	17.11	0.620
Physical Comorbidity - Summary Score		31.69	31.48	0.942

^aBaseline survey respondents only. ^bAll interventions "4257," all controls "4247"
^{**}Questions identified a priori to assess disease management

Flow Chart of Patients showing enrollment and retention of patients and survey response rates



Mortality

- SLM
 - 191/4257 (5.3%)
- Control
 - 211/4247 (5.8%)
- Difference not statistically significant

Hospitalizations

- All Fractures (SLM=44, Control=68, p=0.045)
- Hip Fracture (SLM=6, Control=21, p=0.007)
- CHF (SLM=191, Control=141, n.s.)
- All Cause Diabetes (SLM=528, Control=519, n.s.)

Differences in Member Health Status and Satisfaction at the End of 18 Months

	Intervention Group (n=2271)	Control Group (n=2176)	P Value
HIA Questions identified a priori			
General health (1-5 scale)	-0.1018	-0.1425	0.052
Compared to one year ago, how would you rate your health in general now? (1-5 scale)	0.0511	0.0859	0.1412
If you now require assistance with daily tasks, who helps you? Paid caregiver (%)	0.08	0.06	0.7315
Is there a friend or family member you can count on in an emergency (%)	0.50	0.20	0.5348
Do you use any of the following aids all or most of the time? Cane (%)	2.1	3.4	0.1068
Do you use any of the following aids all or most of the time? Walker (%)	1.7	1.9	0.8213
Do you use any of the following aids all or most of the time? Dementia (%)	3.2	2.2	0.2586
During the past year, how many times have you fallen to the ground? (1-6 scale)	-0.0595	0.0220	0.0175

* Baseline survey respondents only. N all interventions =4257; N all controls =4247

Additional Findings

	Intervention Group	Control Group	P Value
Getting to places outside walking distance (1-3 scale)	-0.0009	-0.0469	0.0173
Extent physical or emotional health interfered with social activities (1-5 scale)	-0.0392	-0.1131	0.0189
Feeling full of pep (1-6 scale)	-0.0613	-0.1447	0.0239
Urinary incontinence (1-5 scale)	-0.0560	-0.1380	0.0122
Safety in own home (1-6 scale)	-0.0110	-0.0560	0.0121
Weight (lbs.)	0.9990	-0.3990	0.0591
SF-36 Domains			
General Health	-1.4963	-2.2891	0.0871
Bodily Pain	-0.7816	-1.8168	0.3605
Mental Health	-0.1335	0.0129	0.7403
Physical Function	-4.2897	-4.0414	0.6770
Role Limitation - Emotional	-2.7340	-2.2421	0.6644
Role Limitation - Physical	-3.0934	-4.4462	0.2835
Social Function	-1.4218	-2.7716	0.0461
Vitality	-1.5314	-2.2771	0.1386
Mental Component - Summary Score	-0.1603	-0.2293	0.7863
Physical Component - Summary Score	-1.2449	-1.5643	0.2151
Satisfaction			
How would you rate all your experiences with the plan now?	0.3203	0.1170	0.0002

Financial Summary (\$ PMPM)

	Baseline		Study Period	
	Intervention Group	Control Group	Intervention Group	Control Group
Hospital	103.91	102.20	155.70	160.82
Outpatient	66.04	61.22	83.12	86.10
Physician	92.43	94.74	121.68	117.53
Home Health	8.06	10.30	31.99	14.11
SNF/Rehab	27.87	22.98	28.50	30.19
Durable Med Equip	8.54	7.00	8.78	9.35
Other Costs	15.20	12.94	18.21	19.70
Total Cost of Care	313.51	304.38	419.20	428.45
Difference in Cost of Care (%)	9.23 (3%)		9.25(-2%)	
Cost of SLM Program	None	None	10.50	None
Total Cost	313.51	304.38	429.70	428.45

Cause-specific medical costs (\$ PMPM)

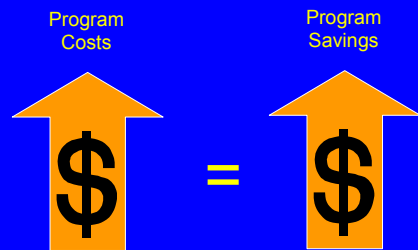
	Baseline		Intervention Period	
	Control	SLM	Control	SLM
All Fractures*	6.34	4.84	13.92	7.73
Hip Fractures*	1.99	1.81	3.97	2.61
All Diabetes	81.07	80.49	93.44	85.55
CHF*	7.73	8.29	11.02	14.41

* Inpatient costs only

Key Findings

	Intervention Group	Control Group
• Total medical costs between baseline & 12 months	↑	↑
• General health status between baseline & 12 months	↓	↓
• Member satisfaction	↑	—
• Falls	↓	—

Financial Bottom Line



(roughly equivalent)

Conclusions

- Modestly better outcomes
 - General Health, Self-Reported Falls, Satisfaction with Health Plan, Global Domain of Social Function (SF-36)
 - Overall health status decline and increase in costs compared to baseline
- Lower rate of hospitalization for fracture
- No significant differences in costs of care for diabetes and CHF
- Program Cost Neutral
 - Slight decrease in HCRU offset by admin costs

***This is a Good Outcome
... But are We Willing to
Pay for it?***

“The true value of disease management is as a paradigm by which the healthcare system can re-engineer how it goes about its business – with clear goals, recognized standards, and ongoing monitoring. The adoption of evidence-based best practice guidelines and the attendant reduction in practice variation will inevitably benefit millions of patients.”

M Berger, P Nebenfuhr, R Murray

“The Value of Disease Management – Approaching the Industrialization of Modern Medicine” Disease Management & Health Outcomes 2000 Oct 8 (4): 181-184.