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Expanding Care Management for Special Needs Populations

Return on Investment: Managing Complex Populations using Data

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Outline

- Predictive modeling (PM) brief
- Case finding with PM in frail elderly
 - Intervention and medical costs
- Medicaid complex medical members with substance use disorders
 - Intervention and return on investment

Predictive modeling

The Johns Hopkins University

ACCG

Case-Mix System™

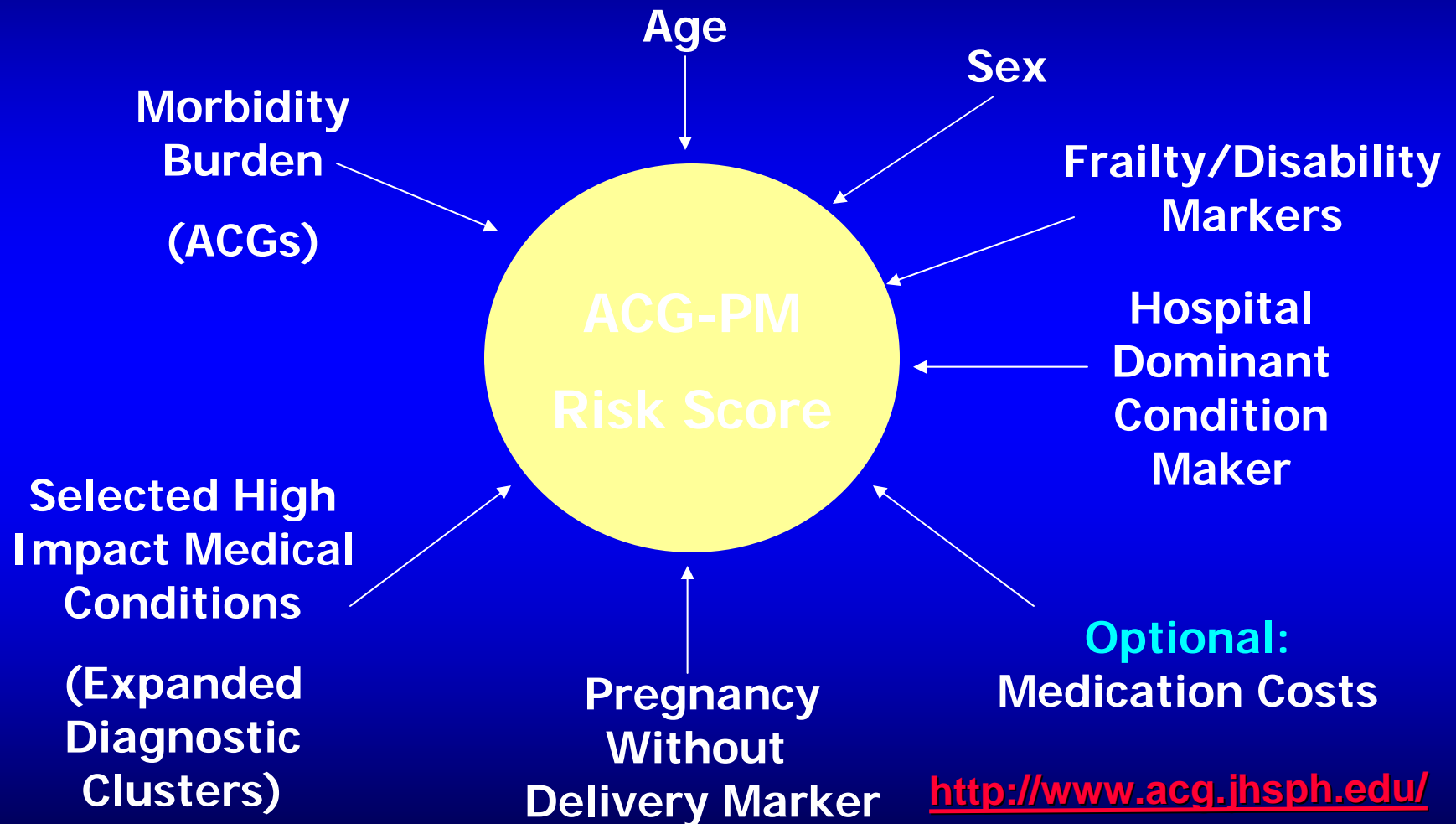


<http://www.acg.jhsph.edu/>

The ACG Predictive Model

- Analysis of existing administrative claims data
- Employs statistical techniques to project the **impact of co-morbidity and other factors** on an individual's use of health care resources in a future time period
- Values of R^2 in costs or utilization: 0.07 – 0.23
- C-statistic in utilization: 0.69 – 0.73

The Johns Hopkins ACG Predictive Model (ACG-PM)



ACG-PM Outputs

Two examples:

Probability Score: represents the likelihood that a member will be among those persons using extraordinary health care resources

- Scores range from 0 to 1. Score of 0.4 means the individual has a 40 percent probability of being in the top 5% of high-cost cohort next 12 months

Predicted Resource Index: can be readily converted to a predicted dollar amount

- Scores range from 0 to roughly 40 with a population mean of 1.0.

Case finding with predictive modeling and frail elderly



Older Adults with High ACG Scores

- Care Management interventions must be accurately targeted to older adults with two characteristics:
 - At high risk for healthcare expenditures
 - Clinical needs could be mitigated by clinical intervention
- The ability of ACG-PM risk scores to predict older persons' use of and costs of healthcare have been validated, current study (Sylvia et al. 2006) describes the clinical features of persons with high ACG-PM scores

Selection Algorithm Older Adults

USFHP currently enrolled
Age \geq 65 at Wyman Park Medical Center
n=826

Classified top 18% as high-risk
n = 150

Analyzed administrative data
(demographics, use and costs of services)
Conducted a supplemental
survey of high-risk enrollees
(Sociodemographics, general health, bed disability days)

Demographic and Social Characteristics of Older Adults

Demographic and Social Characteristics of High- and Low-risk Enrollees			
Demographics	<i>Low-risk, n = 676</i>	<i>High-risk, n = 150</i>	<i>p value</i>
Age, years	74.4	76.0	0.015
Age group			0.051
65-74 years	56.8%	48.6%	
75-84 years	36.2%	40.7%	
85+ years	7.0%	10.7%	
Female sex	57.4%	54.7%	0.541
White race	43.0%	54.7%	0.038

Source: Sylvia et al., Disease Management, 2006.

Clinical Characteristics of Older Adults

<i>Disease Prevalence</i>	<i>Low-risk n = 645</i>	<i>High-risk n = 150</i>	<i>p value</i>
Ischemic heart disease	15.3%	51.3%	< 0.001
Congestive heart failure	2.2%	29.3%	< 0.001
Hypertension	74.6%	88.0%	< 0.001
Diabetes	7.1%	26.0%	< 0.001
Osteoarthritis	30.4%	44.7%	< 0.001
COPD	7.0%	22.0%	< 0.001
Depression	4.8%	15.3%	< 0.001
Dementia	4.7%	12.0%	< 0.001
Parkinson's Disease	1.9%	4.0%	0.113
Number of chronic conditions (of the list of nine above)	1.48	2.93	< 0.001

Clinical Characteristics of High-risk Survey respondents

Survey Respondents,
n = 120

Health status^a: general health

Excellent	2.5%
Very good	20.2%
Good	34.5%
Fair	36.1%
Poor	6.7%

Functional ability^a

Difficulty in performing at least one of five ADLs ^b	36.3%
Difficulty in performing at least one of seven IADLs ^c	58.1%
Any bed disability days in the past 6 months	38.7%
Any restricted activity days in the past 6 months	52.3%

^b Activities of Daily living (ADLs): bathing, dressing, eating, getting in and out of chairs, toileting.

^c Instrumental Activities of Daily Living (IADLs): using the telephone, doing housework, taking medications, getting to places beyond a walking distance, preparing meals, shopping, managing money.

PM case finding conclusions

- Elderly with high ACG-PM risk scores have high prevalence of chronic disease, functional disability and suboptimal health
- Non-respondents to survey had more chronic conditions and higher costs than respondents

(Sylvia et al. 2006)

**Frail elderly:
PM, intervention and medical
costs**

Measuring Outcomes

Guided Care Pilot Study

- Quasi-experimental study conducted in October 2003 to September 2004
- Primary care practices (2 GC; 2 UC) in urban Baltimore
- Guided Care Nurse, two internists

(Sylvia et al, 2008)

Baseline Characteristics

Mean (SD) or Percent

	Guided Care (n=63)	Usual Care (n=65)
Demographics		
Age	76.1 (6.15)	75.8 (6.53)
% Female	60.3%	47.7%
ACG-PM*	0.34 (0.22)	0.20 (0.14)
*Statistically Significant p<0.05		

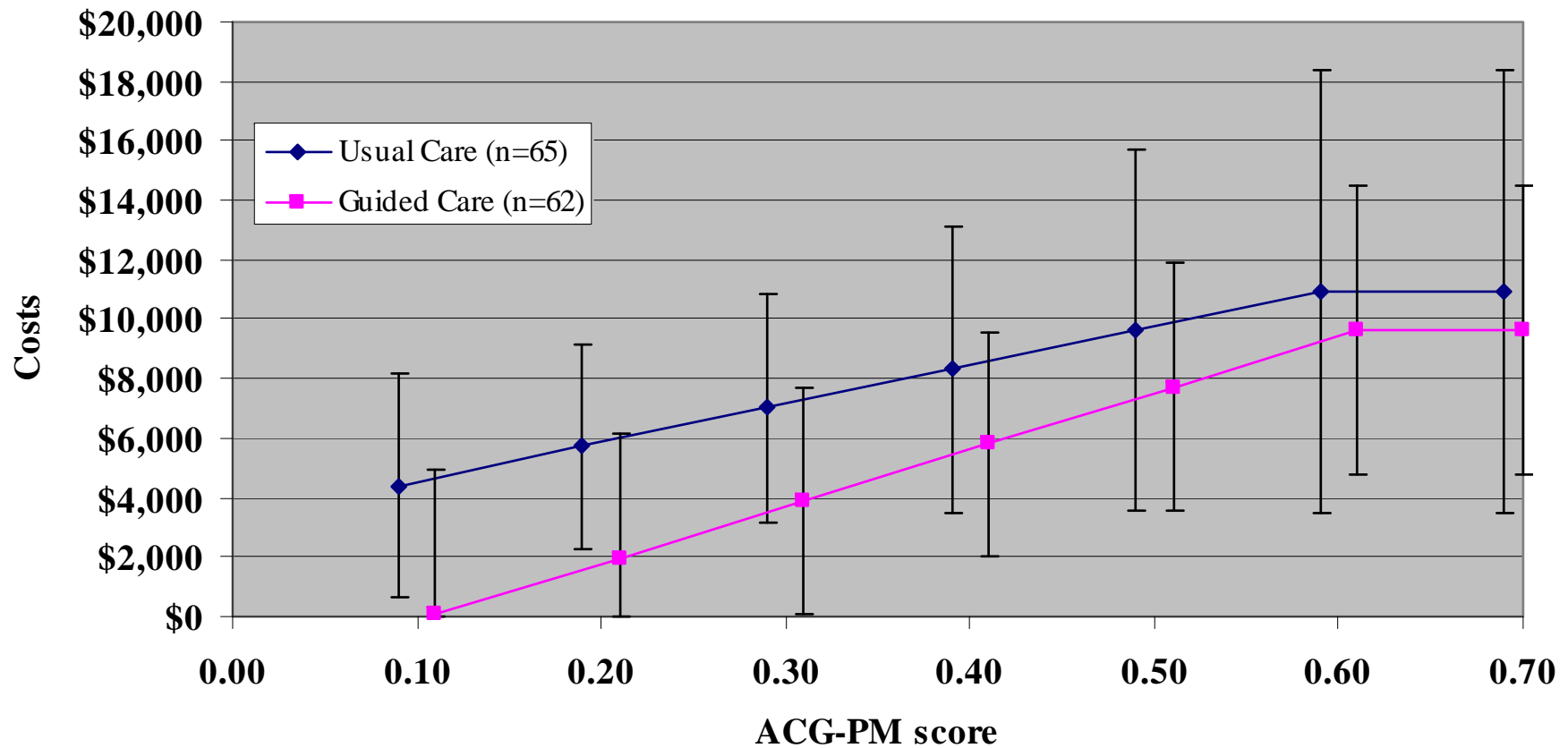
Baseline Characteristics

Mean (SD) or Percent

	Guided Care (n=63)	Usual Care (n=65)
Health Status**		
# Chronic Conditions (max = 9)	2.95 (1.54)	2.85 (1.31)
Ischemic Heart Disease	52.2%	49.2%
Congestive Heart Failure	31.7%	21.5%
Hypertension	88.9%	86.1%
Diabetes	30.2%	20.0%
Osteoarthritis	49.2%	46.1%
Parkinson's Disease	1.6%	7.7%
Dementia	7.9%	13.8%
Depression	12.7%	18.5%
COPD	20.6%	21.5%
*Statistically Significant p<0.05		
**Expanded Diagnostic Categories (EDCs) from ACG software output used to define disease categories		

Costs by ACG Score: Guided Care vs. Usual Care

GC vs UC: Costs at ACG-PM Cut Points
Adjusted for Age, Gender



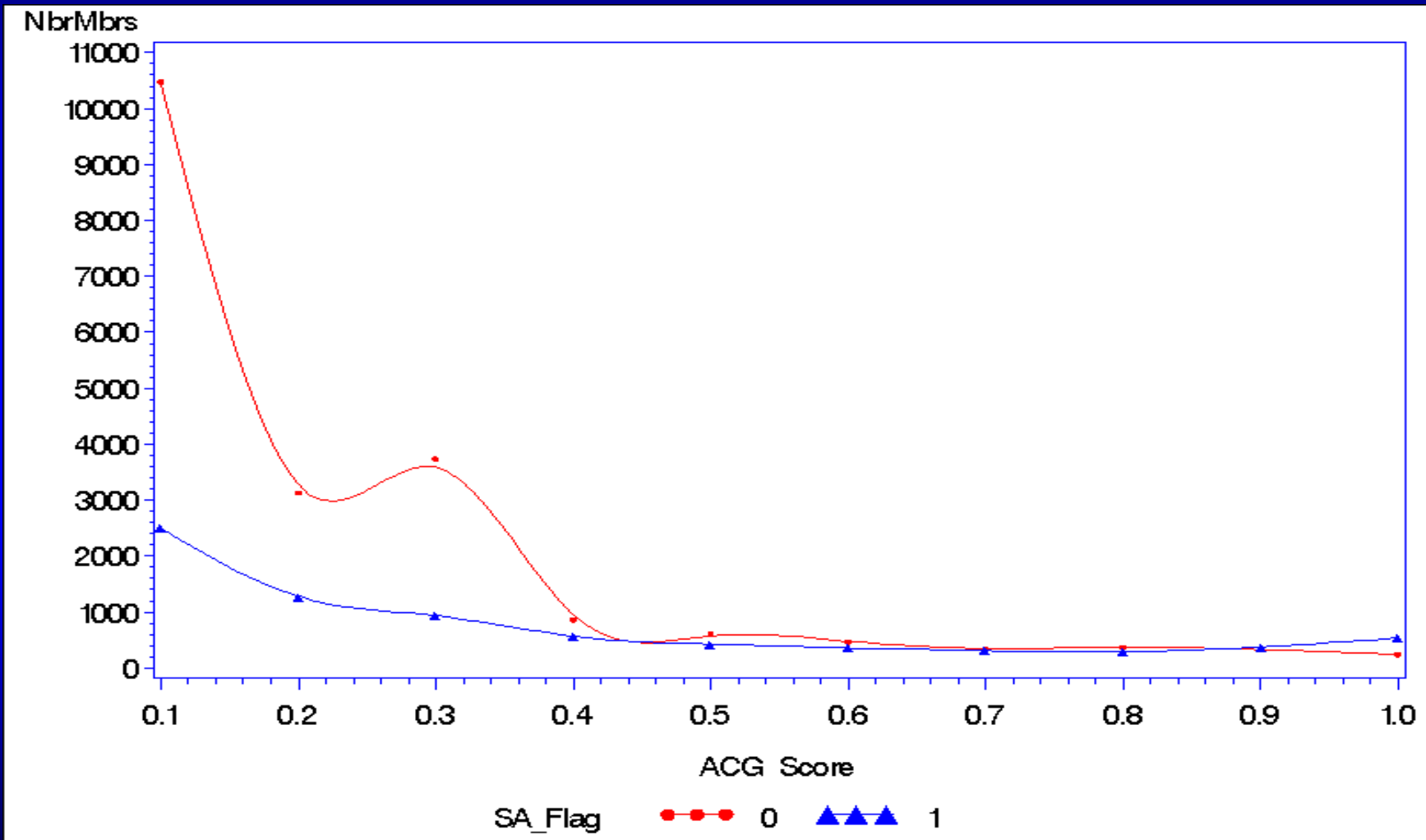
Successful Multi-Morbid Care Management Interventions

Evaluation of interventions targeted at patients with multi-morbidity suggests:

- Trends toward lower costs and utilization of services
 - Dependent on level of illness burden (ACG risk score)
- Improved satisfaction with primary care and chronic illness care
- Increased patient activation and self-care skills
- Improved quality of care
- Decreased caregiver burden and strain

Medicaid complex medical
members with substance use
disorders

Morbidity and Substance Abuse in PPMCO



Project goals for Medicaid Initiative¹

- Facilitate access of enrollees with high risk medical and history of substance abuse into SA treatment and promote retention in program
- Enroll the participants in appropriate Disease Management (DM) or Case Management (CM) program
- Track start-up and operational expenses of care management initiative

¹ Supported by a grant from the Center for Health Care Strategies through a Grant from the Robert Wood Johnson Foundation

Intervention Group Selection Criteria

- N = 400, => 21yrs, living in Baltimore City, Baltimore Co. or Prince Georges Co.
- Substance abuse disorder history
- **ACG-PM score => 0.39. Selected highest 16% of possible 2,485.**
- Excluded: HIV/AIDS, Pregnancy, End Stage Renal Disease, End of Life because already in specialized DM program and did not want to disrupt current program.
- Same selection criteria for **Comparison Group**

Project expenses

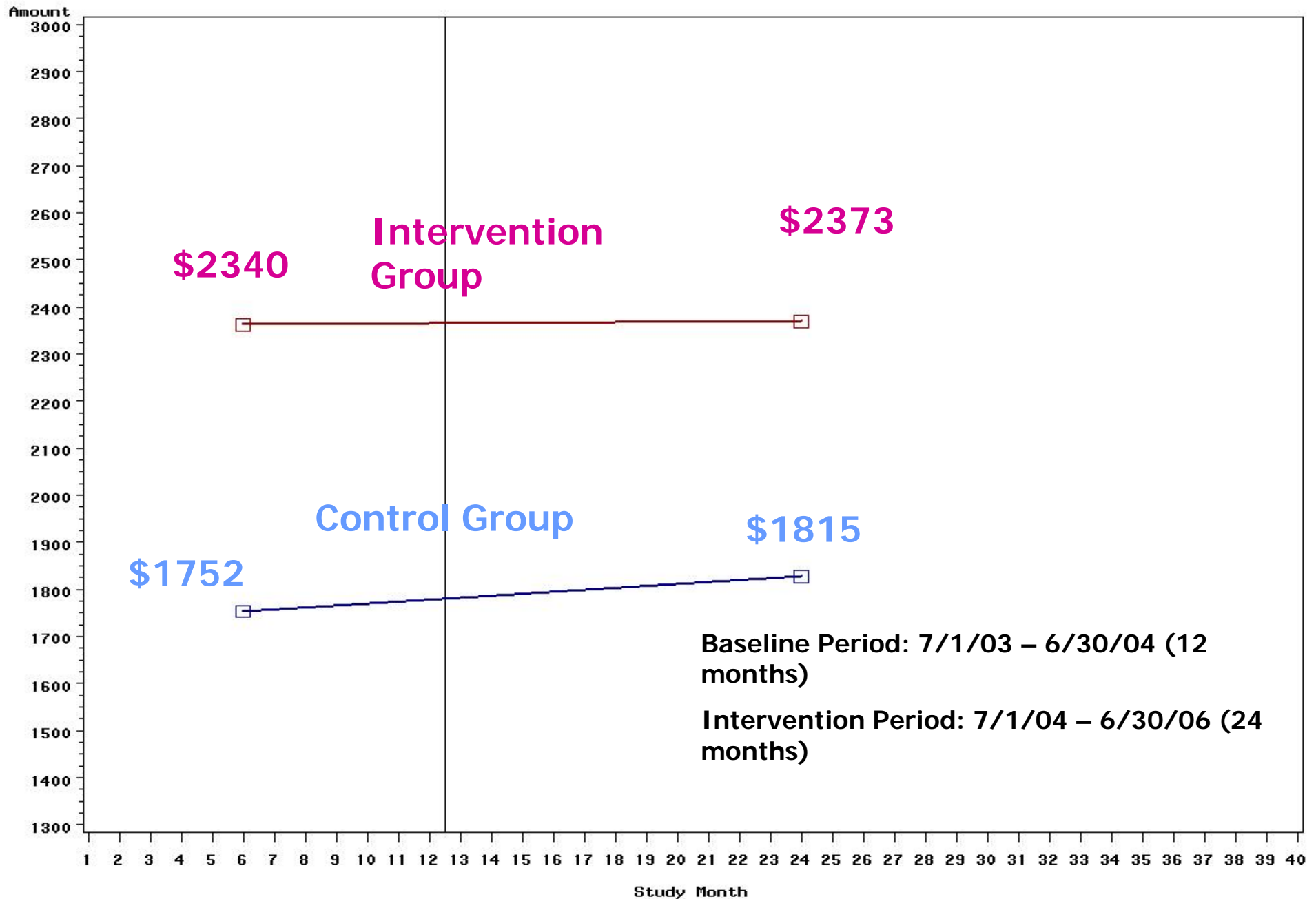
MCO Expenses

Project start-up expenses \$40,276

24 month operational expenses \$237,318

TOTAL PROJECT EXPENSES \$277,594

Average Costs by Study Group over time (FFS+ Rx+ Enc)



Pre-post ROI

- Healthcare Expenses

PMPM expenses pre intervention:	\$2340
PMPM expenses intervention (24 mos)	<u>\$2373</u>
	\$ -33

- Member months in intervention period: 7,444

- Estimated Loss: Estimated monthly loss x months

$$\text{\$ -33} \times 7,444 = (\text{\$245,652})$$

- ROI:

$$\text{Est. Loss} - \text{Intervention Exp} / \text{Intv. Exps} = - 3.26$$

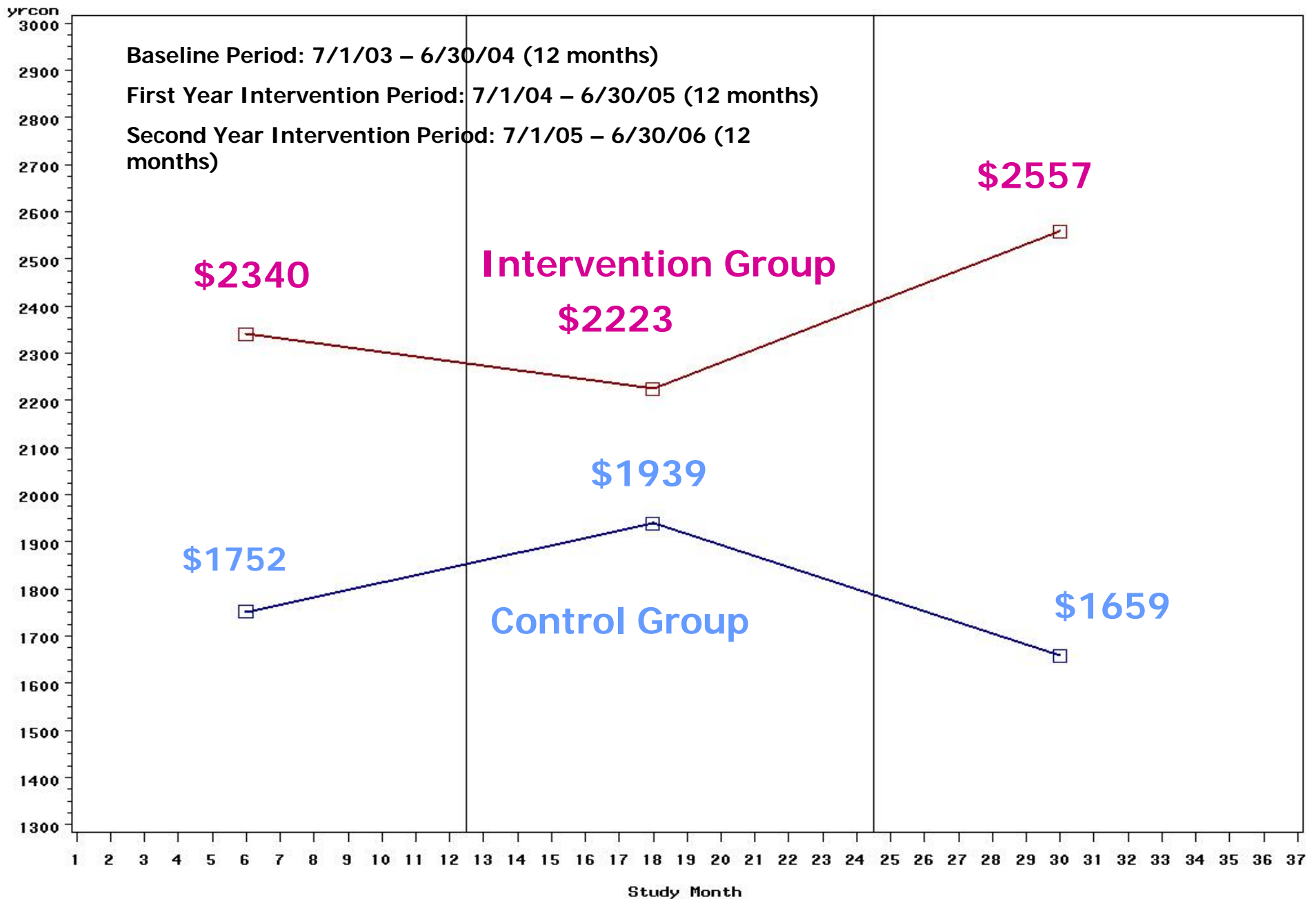
Adjusted Pre-post ROI

- Healthcare expenses change:

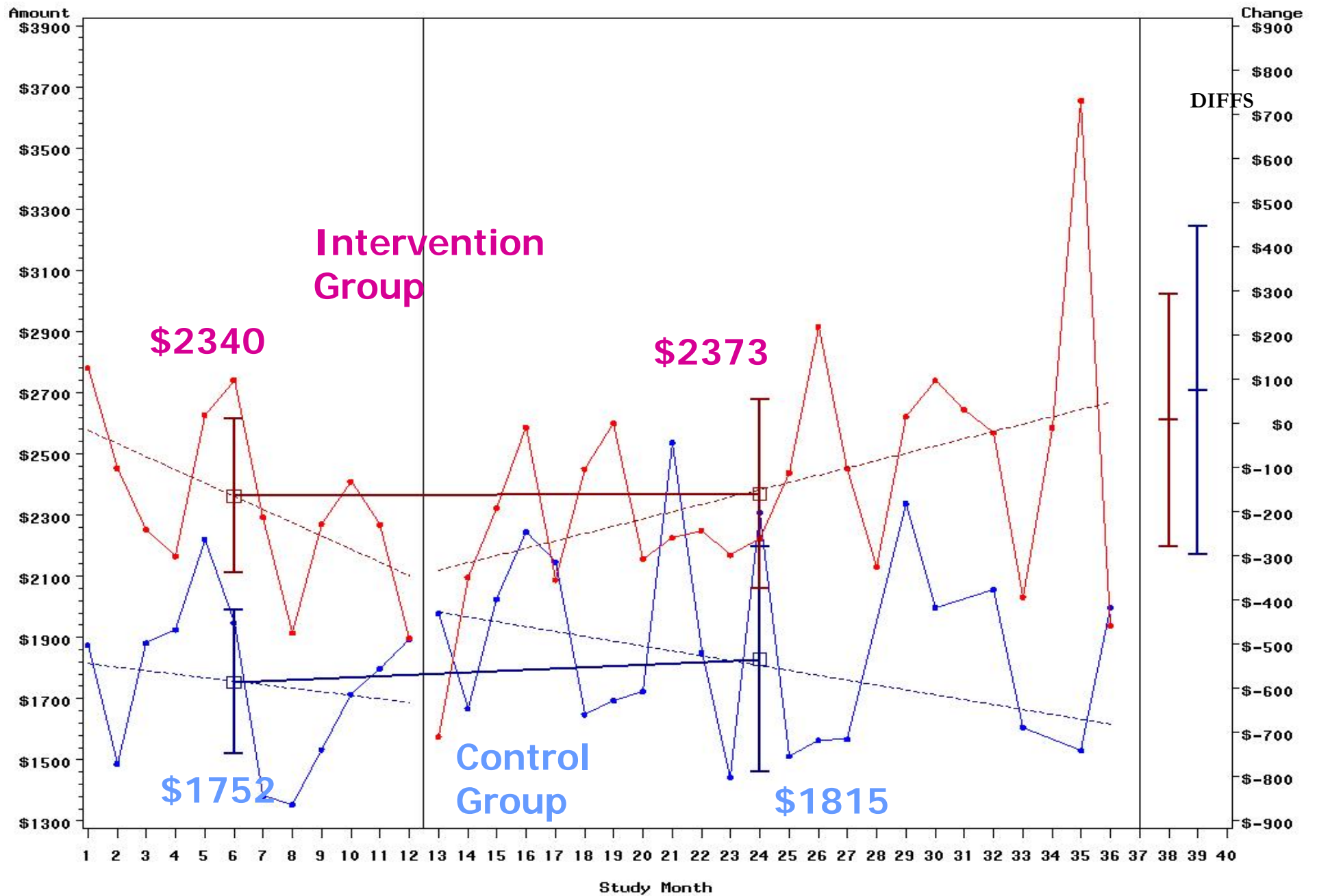
Intervention group:	Increased	\$	32
Comparison group:	Increased		<u>64</u>
	Difference	\$	32

- Member months in intervention year: 7,444
- Estimated Savings: Estimated monthly savings x months
 $\$32 \times 7444 = \$238,208$
- ROI: Estimated savings / Total Expenses
 $\$238,208 / 277,594 = \mathbf{0.86}$

Average Costs by Study Group over time (FFS+ Rx+ Enc)



Average Costs by Study Group over time (FFS+ Rx+ Enc)



Medicaid complex medical and substance use conclusions

- Similar QEIs can be undertaken with expectation of minimal cost risk
- Trend analysis should complement ROI report
- Case management can engage similar population in DM/CM; SA Tx remains a challenge
- Further research need of identifying and implementing care management team core competencies in serving this population

References

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