Controlled Substance Risk Mitigation: Outcomes in a Prescriber-Centric Program

TAMPA

AMCP's 26th ANNUAL MEETING & EXPO

AMCP Academy of Managed Care Pharmacy®

Learning Objectives

- Discuss the scope of opioid abuse in the insured population
- List available options for decreasing inappropriate use and abuse of prescription opioids
- Describe a controlled substance risk mitigation intervention focused on influencing drug prescribing
- Recognize opportunities for costs savings related to improved opioid prescribing behaviors and decreased rates of opioid abuse among plan participants

Continuing Pharmacy Education Credit

- Visit www.amcp.org
- Click on “Claim my CPE”
- Have available:
  - AMCP member ID
  - NABP e-profile ID

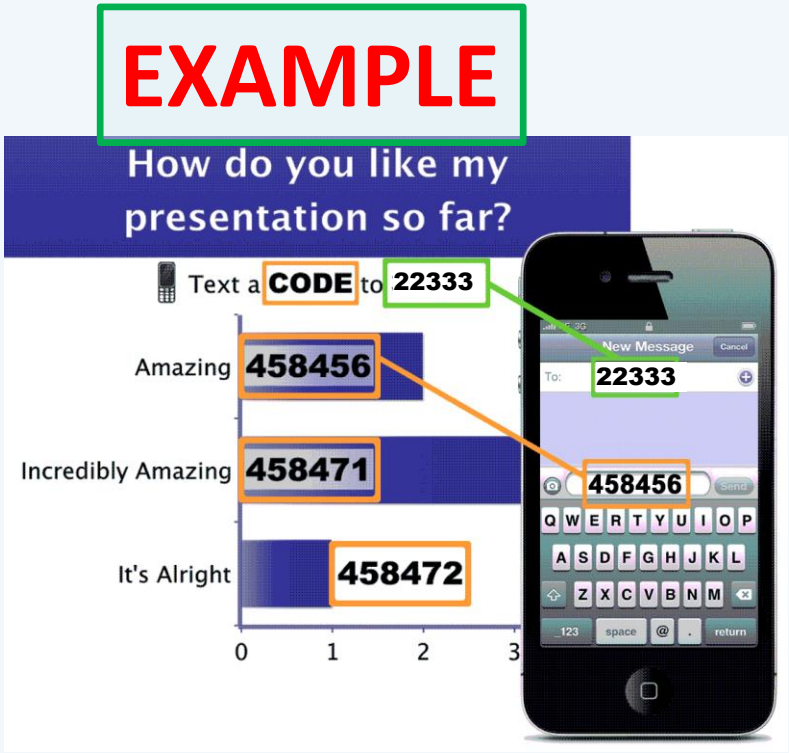
- Complete and submit session evaluation **no later than** May 5, 2014
- Information in CPE Monitor after June 4, 2014

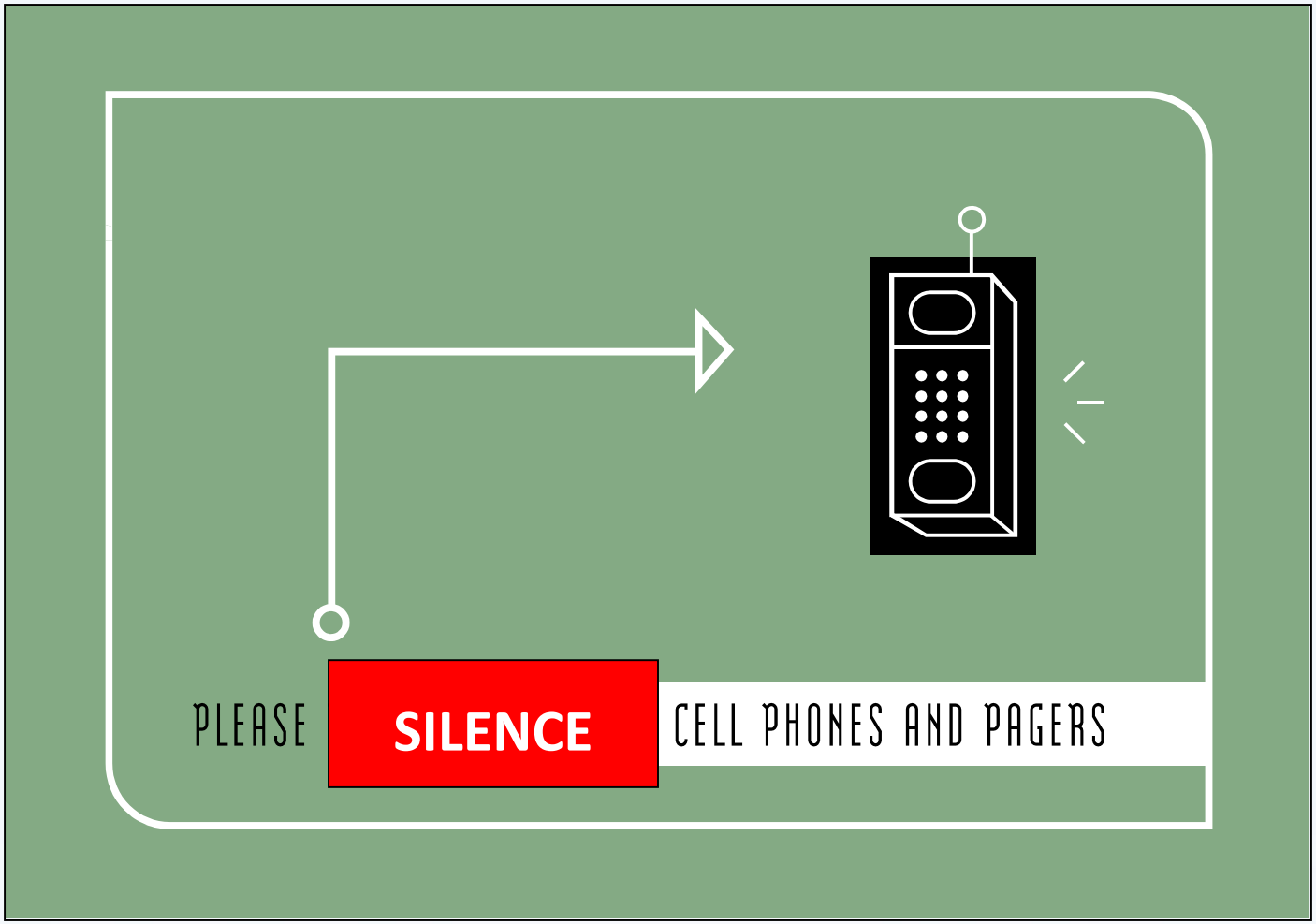
Financial Relationship Disclosures

- Paul DuBose and Saira Jan report having no financial relationships with any commercial interests during the past 12 months

How to Participate in Audience Response

- Have your cell phone ready
- Text responses to **22333**
  - Standard text messages apply
  - Poll Everywhere cannot see your telephone number




PLEASE
SILENCE
CELL PHONES AND PAGERS

Speakers

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Learning Assessment Question #1

According to a study published in 2005 by White AG et al, the average annual per patient health care cost in the population of opioid abusers as compared to non-opioid abusers was:

a. 8.3 - 8.7 higher
b. 1.9 - 2.5 higher
c. 3.2 - 5.1 lower
d. 12.3 - 12.9 higher

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Learning Assessment Question #2

Which of the following prescriber-centric risk factors commonly appears in a Top 3 list?

a. Multiple prescribers
b. Suboxone® (buprenorphine and naloxone sublingual film) volume
c. Opioid concomitance with *benzodiazepine* or *carisoprodol*
d. Multiple pharmacies

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Learning Assessment Question #3

Which of the following is the **least** useful strategy in a prescriber-centric risk scoring program?

a. Identify/stratify in population and by specialty peers
b. Predict risky prescribers by identifying trends
c. Identify each prescriber's top 3 risk behaviors
d. Monitor prescriber behavior once and stop

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Learning Assessment Question #4

According to the Care Continuum Alliance, the method with the highest strength of attribution and adjustment for evaluating the effectiveness of a clinical intervention program is:

a. Historic control
b. Randomized control trial (RCT)
c. Non-experimental control group
d. Pre-post

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Bonus Question #5

In the formula

$$Y_{it} = \alpha_i + \gamma_t + \beta_1 X_{it} + \beta_2 X_{it}^2 + \varepsilon_{it}$$

the ε_{it} term is a measure of:

a. Error
b. Risk
c. Reward
d. Cost

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Section 1

PROGRAM OVERVIEW

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The Problem

- *Opioid Pain Meds Culprits in Majority of Overdose Deaths* (February, 2013)[1]
  - An analysis conducted by investigators at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, showed that **75.2% of pharmaceutical deaths involved opioids, either alone or in combination with other drugs**
  - Data recently released by the National Center for Health Statistics show drug overdose deaths increased for the **11th consecutive year in 2010**. Pharmaceuticals, especially opioid analgesics, have driven this increase

Impact on Cost of Care

- Average annual per patient health care costs in 1998-2002
  - $15,884 to $18,388 among abusers
  - $1,830 to $2,210 among non-abusers (ratio of 8.3–8.7 to 1)[2]
- Hospital admissions
  - 456% increase in admissions for opioid abuse, 1997-2007[3]
- Emergency Department services
  - 7-fold increase in oxycodone-related visits, 1996 to 2002[4,5]
- Opioid abusers compared to non-abusers
  - 4 times as likely to visit the emergency room
  - 12 times as many hospital stays
  - 63 times as many outpatient visits[2]

What We Set Out to Accomplish

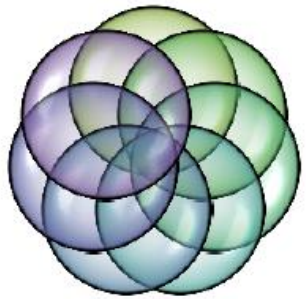
- Prescriber-centric approach to augment patient-focused efforts
- Identify prescriber factors of inappropriate prescribing
- Coordinate care with behavioral health case managers
- Provide education and resources prescribers perceive as valuable
- Safe use of opioids for patients who require treatment for pain
- No abandonment of “difficult” patients

Risk Identification & Intervention

Rx Data Analysis

Risk Scoring of Prescribers

PSI Score™



Prescriber PSI Score™ and Scores for Top 3 Risk Factors (out of 17 total factors)

#1 Risk Factor: Early Refills

#2 Risk Factor: Excessive Use

#3 Risk Factor: Dosage and Volume of Opioids

Engagement via Personalized Outreach

Prescriber Resources Toolkit

1:1 Individualized Consultation via Telephone or In-person

Monthly Communication; Quarterly Score Updates

Success Requirements

- Enterprise-wide collaborative support with Horizon's:
  - Pharmacy Department
  - Provider Relations and Communications
  - Regional Medical Directors
  - Logistics, Production, Shipping
  - IT and Data Management
  - Behavioral Health
  - Case Management and Social Work
- Weekly monitoring by the program team for CQI

Section 2

IDENTIFICATION PHASE

METHODS AND RESULTS

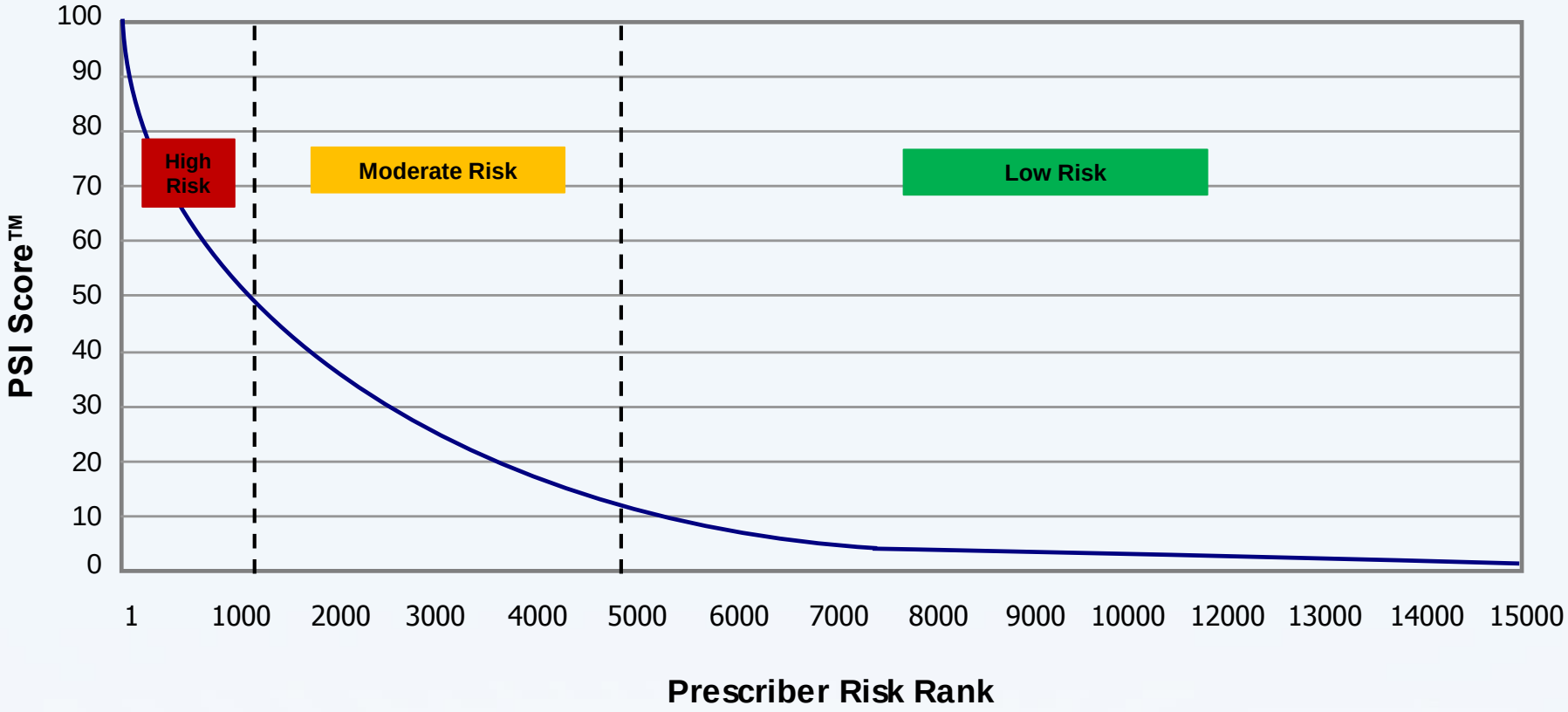
Identify Prescriber "Risk"

- Concept of "risk factors" borrowed from disease management
- At what point would you allocate resources to intervene with the following prescriber?
  - Starts most patients on highest dosage
  - Frequently prescribes excess days supply
  - Is located 50+ miles from many of his patients
  - High patient volume compared to specialty peers

The PSI Score™

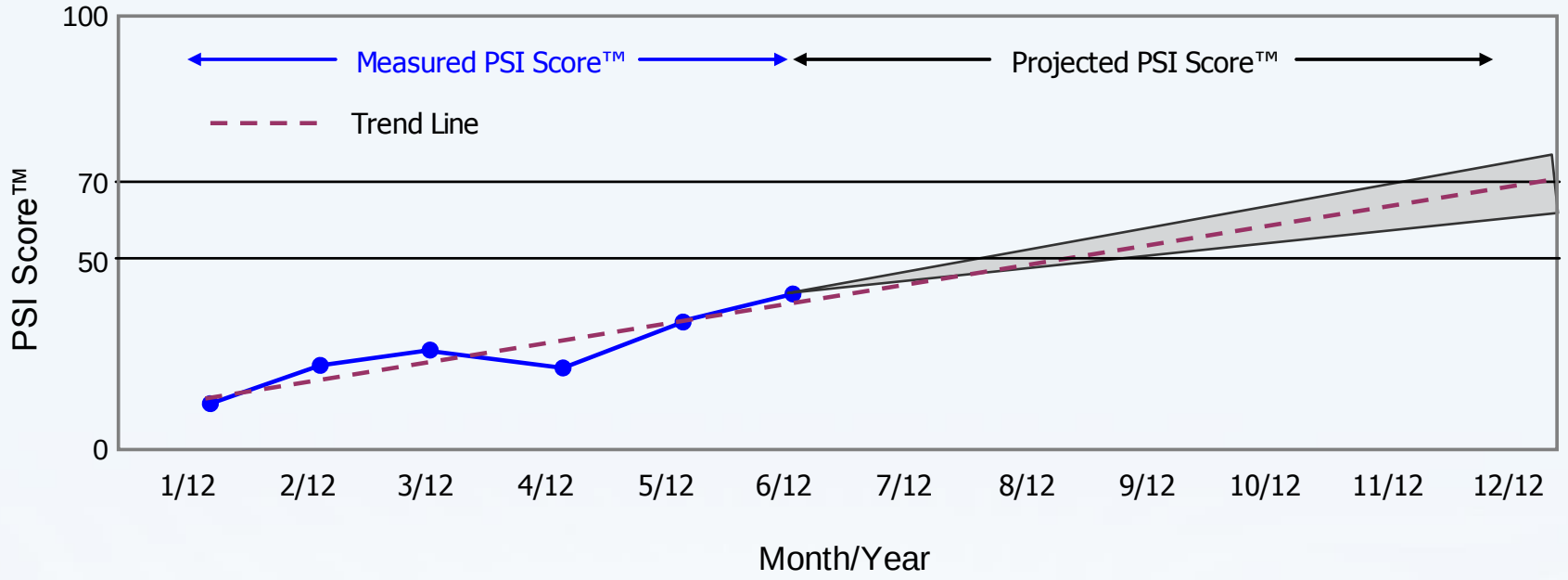
- Identify/stratify in population and by specialty peers
- Predict risky prescribers by identifying trends
- Individualize the intervention effort by identifying each prescriber's top 3 risk behaviors
- Monitor prescriber behavior change over time
- CQI: Measure intervention effectiveness, and improve
- Comply with treatment directive to identify prescribers and members for review of appropriateness of opioid therapy

Prescriber Risk Score Distribution



Predictive Risk Identification

Which prescribers not currently in the High Risk group will, in 6 months, have a PSI Score™ equal to or greater than the cutoff value that defines "high risk", with a 90% confidence level?



Identification Results

- 1,200 prescribers identified for engagement
- ≥ 98th %^{ile} of the PSI Score™ distribution

High-risk Prescriber Distribution by Specialty	
Family Medicine	23%
Internal Medicine	22%
Psychiatry	9%
Pain Management	7%
Surgery	7%
Physical Medicine & Rehab	7%
Anesthesiology	6%
Physician Assistant	4%
Nursing	4%
Other	12%

Identification Results (continued)

- Most frequently occurring risk factors (among prescribers' top 3)

Prescriber-focused Risk Factors
Early Refills of Similar Products
Dosage and Volume of Opioids
Opioid with *benzodiazepine* or *carisoprodol* Concomitance
Excessive Use of Controlled Substances

Patient-focused Risk Factors
Multiple Prescribers
Multiple Pharmacies
Multiple Family Members

Critical Identification Lessons

- NOT claiming that any prescriber is engaging in inappropriate behavior
- Most prescribers are not aware their patients are engaging in aberrant behavior, such as “doctor shopping”, drug seeking, or diversion
- When a prescriber has a high PSI Score™, it is likely that there are actions that prescriber is not doing that s/he can do to reduce risk and improve patient safety
- The higher the risk level, the greater the opportunity to improve patient safety

Section 3

INTERVENTION PHASE

METHODS AND RESULTS

Prescriber Intervention

- Risk scored the prescriber population
- Stratified the prescriber population by risk category
- Selected the top 1,200 prescribers for participation
- Identified the top 3 risk factors for each prescriber

Prescriber Intervention (continued)

- Engagement
  - 250 prescribers per week for 4 weeks
  - Additional prescribers for 2 more weeks to reach goal of 1,000
- Consultation (CDMI)
  - 20-minute phone call or office visit consultation with PharmD
  - Printed materials with behavioral health referral details
- Follow-up
  - 6 months follow-up communication post-appointment
  - 3-month and 6-month update on PSI Score™ and risk factor scores

Engagement Packet

- Welcome Letter – Personalized and tailored
- Risk Factor Worksheets – Top 3 by prescriber
- Clinical Advisories – Specific to top 3 risk factors
- Patient Information Report – List of each prescriber's patients whose treatment activities contributed to the top 3 risk factors, and 6 months prescribing history
- Resources and Recommendations – Guides, PPA, patient assessment, psych evaluation services, rehab, consultation, and care coordination

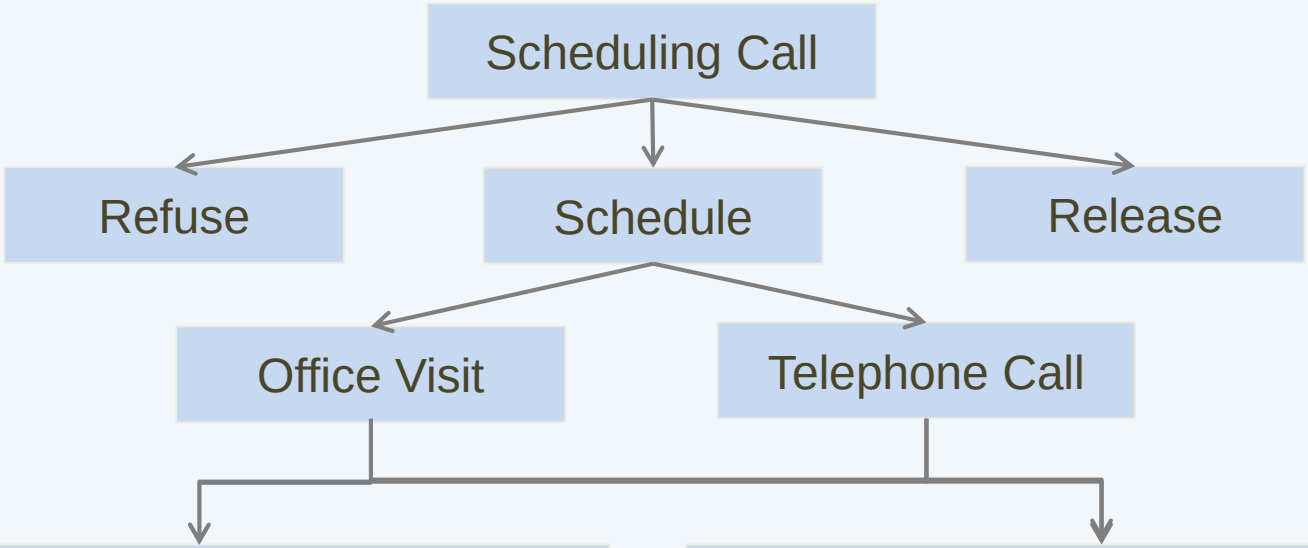
Engagement

- Outbound scheduling calls
  - Call prescriber's office to schedule a 20-minute telephone call or office visit with a licensed PharmD
  - Confirm receipt of the engagement packet
- Confirm the appointment 72 hours prior, by call or email

Consultation

- 20 to 30-minute 1:1 consultation
  - With a PharmD trained in the program protocol
  - By telephone or in-person office visit
- First 4 minutes
  - Assess prescriber's level of motivation versus resistance
  - Adjust objectives, tactics, and timing accordingly

Consultation (continued)



Motivated / Cooperative:

- Review the engagement packet materials
- Explain the purpose of the program, themes, the PSI Score™, risk factors, clinical recommendations, Patient Information Report
- Explain the program follow-up, score updates, and invite further discussion

Resistant / Uncooperative:

- Explain the purpose of the program, themes
- Focus on the resources to help the prescriber
- Shorten appointment; schedule follow-up
- Track PSI Score™ over time and have Regional Medical Director follow-up if necessary

Ongoing Follow-up

- Satisfaction survey within 2 weeks of appointment
- Monthly communications
  - By email unless prescriber requests fax
  - Links to short video vignettes and additional materials on the Web
  - Brief survey questions
- Quarterly score updates
  - PSI Score™ and top 3 risk factor scores
- Relapse monitoring based on updated scores and trends
  - Remedial outreach as necessary

Program Support

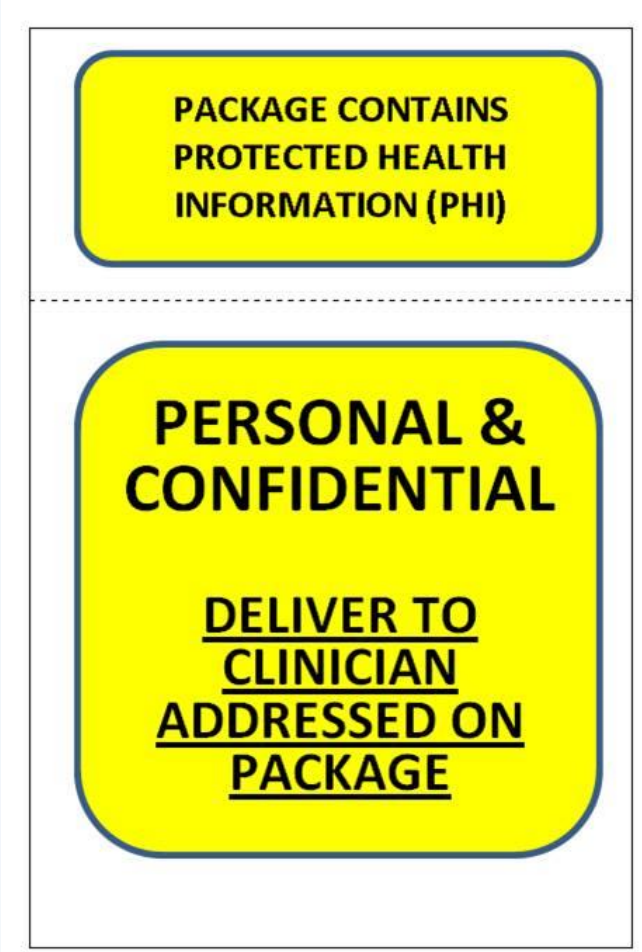
- Service Center
  - Staffed by 4 administrators and 6 PharmD's
  - Outbound and inbound telephone calls, email and fax; dedicated lines and auto-attendant
- Customer Relationship Management (CRM) System
  - Tracks all outbound and inbound communications
  - Collects data on all aspects of the program
  - Repository of all prescriber information
  - Automated operational and clinical reports

Engagement Lessons

- All prescribers who were contacted acknowledged a need to address controlled substances
- Inclusion of detailed prescription information for the prescriber's own patients was a major contributor to prescribers' willingness to participate
- Most prescribers preferred an appointment by telephone call

Engagement Lessons (continued)

- Calls to schedule appointments must occur within 1 week of receipt of engagement packets
- Design the Engagement Packet mailing envelope so office staff see upon receipt that it contains patient PHI and must be delivered only to the prescriber



Intervention Lessons

- Most prescribers read the engagement materials prior to the appointment
- Most appointments were completed within 20 minutes
- Most prescribers expressed concern about being "monitored" by the payer, however:
  - This resulted in high motivation to discuss the program
  - A review of the program themes by the PharmD increased comfort and collaboration

Prescriber Feedback Lessons

- Believed that they were already implementing adequate steps/precautions in their practice
  - Checking the NJ Prescription Monitoring Program website
  - Urine screens
- Additional resources/tools were identified to help improve the safe use of control substances
  - Locking members into a single pharmacy
  - Specific lab tests including “no threshold testing” and “adulteration panel”
  - Addiction specialist and psychological counseling referrals
  - Many providers were not aware of these additional resources

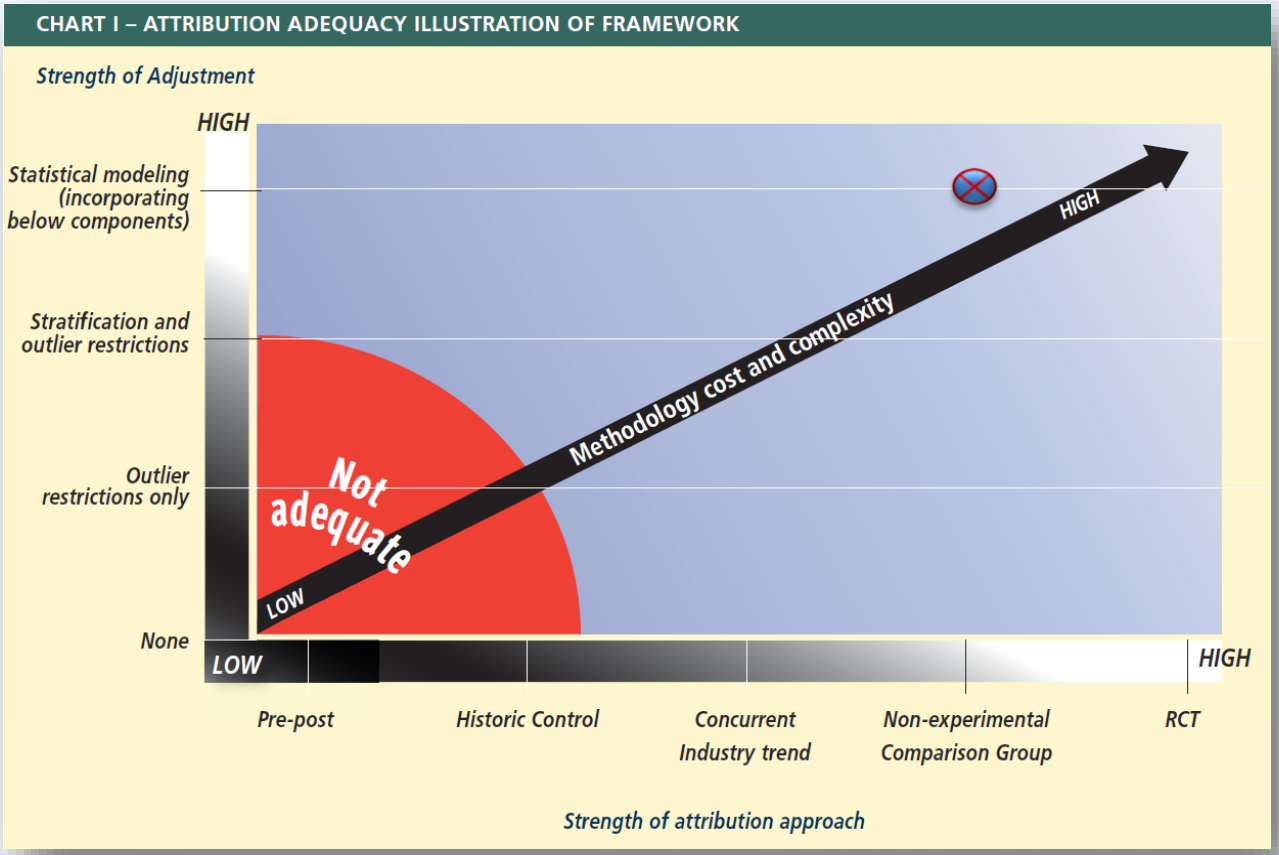
Prescriber Feedback Lessons (continued)

- Member and claim level information was very useful in reconciling charts and taking action as appropriate
  - Many indicated that they would address the 'irregularities' with their patients during the next visit
- Challenges with pain management clinics/centers
  - Members are sent back to the PCP for 'follow-up', refills on controlled substances, and long-term pain management
  - PCPs expressed a low comfort level with managing chronic pain patients but felt they were 'left with no choice'
- Some risk factors surprised providers
  - Multiple family members

Section 4

CLINICAL OUTCOMES

Non-experimental Comparison Group



***Source**: Care Continuum Alliance Outcomes Guidelines Report, Volume 5, 2010.*

CCA Ratings

- LOW Threat to Validity
- HIGH Complexity

Measurement of Clinical Outcomes

- Monthly updates to the PSI Score™ and risk factor scores enable us to:
  - Measure change across the prescriber population and within each specialty group
  - Indirectly measure adoption of clinical recommendations
  - Identify prescriber trends as they develop, permitting early-stage intervention per prescriber and the population
  - Have a continuous feedback look to evaluate program impact and improve effectiveness

Methodology History

- **Method 1**: *Treatment Comparison to Prior Period Control*
  - Designed to handle regression to the mean
  - Results unstable after fourth month
  - Determined that trends caused historical control comparisons to be unreliable
- **Method 2**: *Difference-in-Differences (DID)*
  - Staggered mailings create controls for short time periods
  - With an assumption of a continuation of trends the outcomes for month five and six were estimated
  - Method not appropriate for analysis of more than six months of data

Fixed Effects Panel Regression

- Estimates a unique intercept for each HCP
  - Important since wide variation in risk between top-ranked and bottom-ranked prescribers
- Estimates a specific effect for each month
  - Allows background trends to have complex, non-linear shapes
- Estimates ongoing treatment (ie, # of months treated)
  - Measures growing program impact over time
  - Allows estimating non-linear effects of program over time

Fixed Effects Panel Regression (continued)

- Utilizes a more sophisticated linear regression
  - More rigorous model accounts for sources of variation to provide more accurate estimates
  - Supports analysis of one year program evaluation analysis
  - Validation testing of various pre-treatment baselines provided highly similar results
- Conclusion
  - Method is robust, and properly removes regression to the mean effects

Fixed Effects Panel Regression Model

$$Y_{it} = \alpha_i + \gamma_t + \beta_1 X_{it} + \beta_2 X_{it}^2 + \varepsilon_{it}$$

α_i = Intercept for each HCP

γ_t = Background time change per month

X_{it} = Months treated

Y_{it} = Metric of interest (e.g. PSI Score™)

Treatment with Staggered Cohorts (t=1)

	Mar	Apr	May	Jun	Jul	Aug	Sep
Cohort 1	0	1	2	3	4	5	6
Cohort 2	0	1	2	3	4	5	6
Cohort 3	0	0	1	2	3	4	5
Cohort 4	0	0	0	1	2	3	4
Cohort 5	0	0	0	0	0	1	2

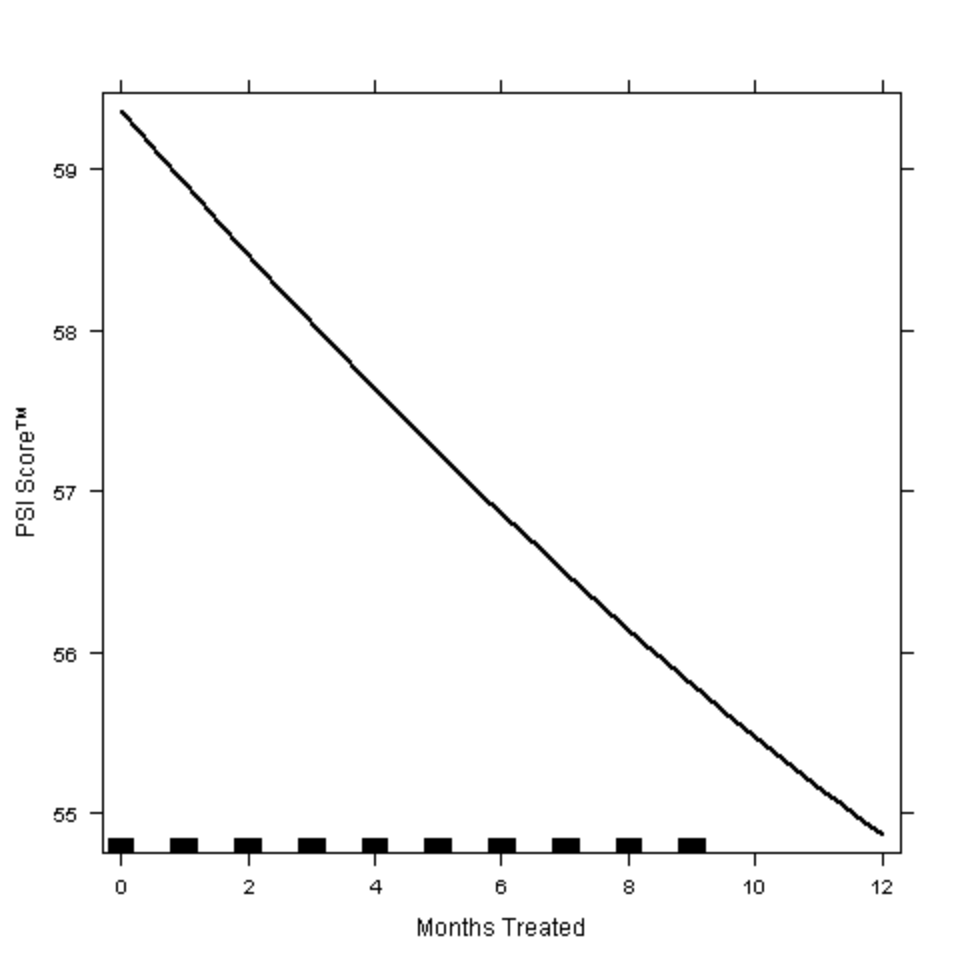
Treatment with Staggered Cohorts (t=3)

	Mar	Apr	May	Jun	Jul	Aug	Sep
Cohort 1	0	1	2	3	4	5	6
Cohort 2	0	1	2	3	4	5	6
Cohort 3	0	0	1	2	3	4	5
Cohort 4	0	0	0	1	2	3	4
Cohort 5	0	0	0	0	0	1	2

Treatment with Staggered Cohorts (t=6)

	Mar	Apr	May	Jun	Jul	Aug	Sep
Cohort 1	0	1	2	3	4	5	6
Cohort 2	0	1	2	3	4	5	6
Cohort 3	0	0	1	2	3	4	5
Cohort 4	0	0	0	1	2	3	4
Cohort 5	0	0	0	0	0	1	2

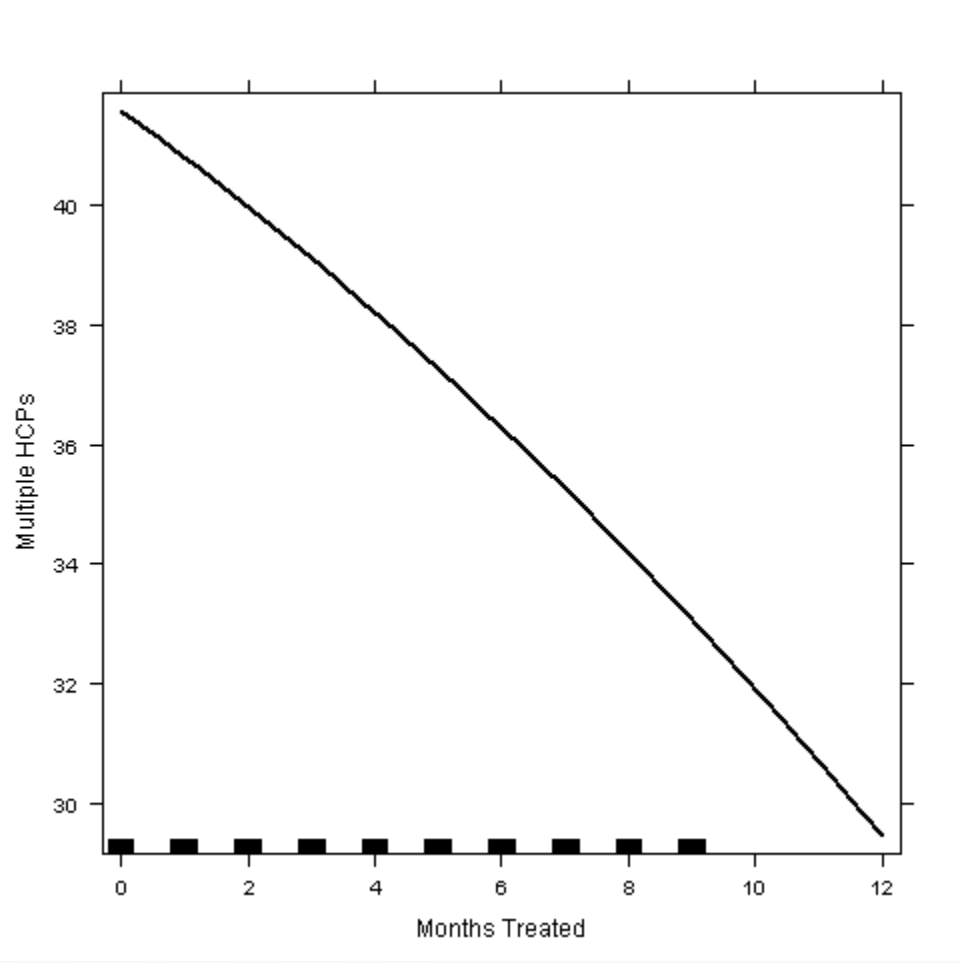
PSI Score™



Month	Month^2	R^2	Adjusted R^2
$P < 0.001$	$P = 0.368$	0.840	0.826

- Linear treatment effect highly significant (Month, $P < 0.001$)
- Slight, non-significant quadratic decrease in treatment over time (Month^2, $P = 0.368$)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.826

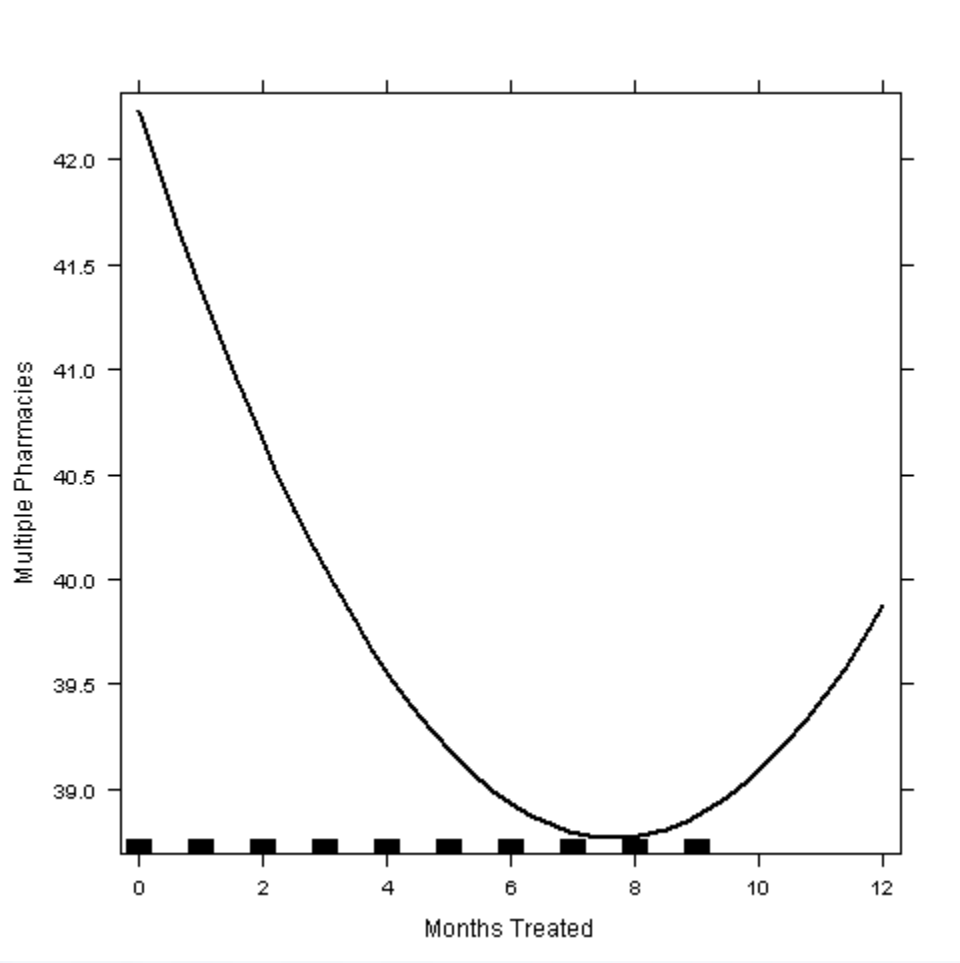
Multiple Prescribers



Month	Month^2	R^2	Adjusted R^2
$P < 0.001$	$P = 0.196$	0.763	0.741

- Linear treatment effect highly significant (Month, $P < 0.001$)
- Slight, non-significant increase in quadratic treatment over time (Month^2, P = 0.196)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.741

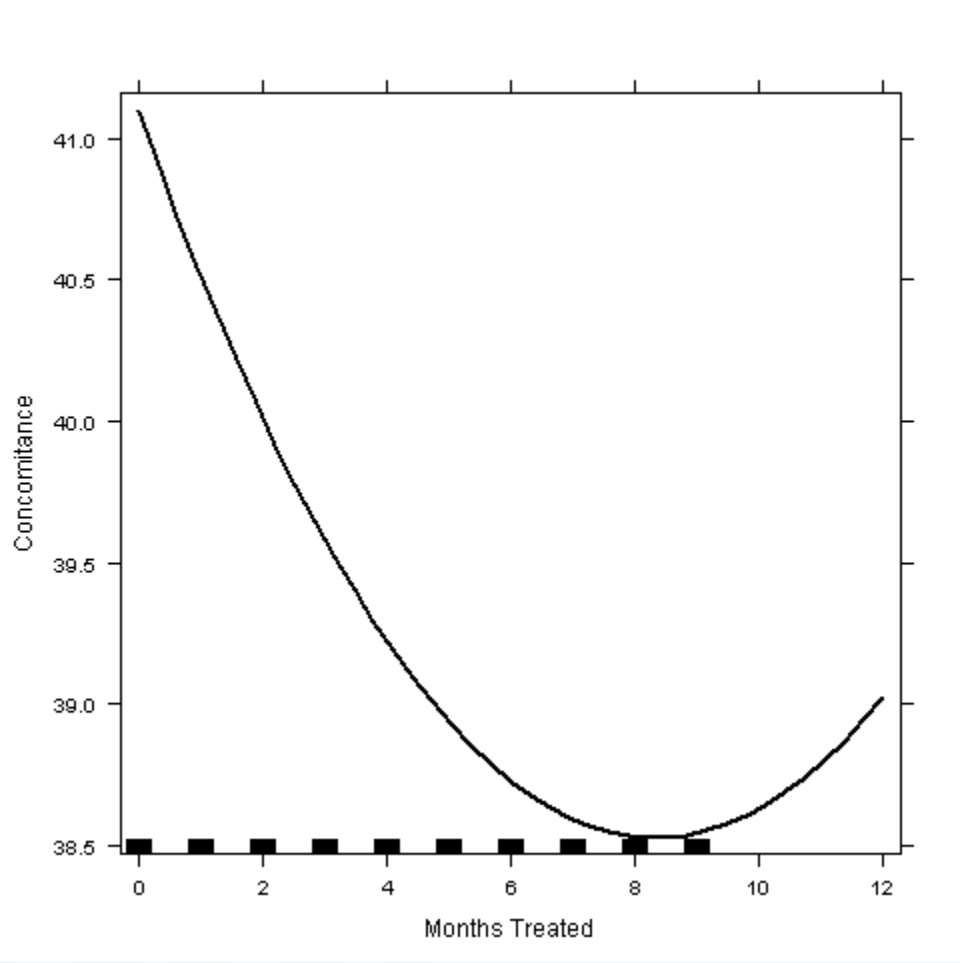
Multiple Pharmacies



Month	Month^2	R^2	Adjusted R^2
$P < 0.001$	$P < 0.001$	0.736	0.712

- Linear treatment effect highly significant (Month, $P < 0.001$)
- Highly significant quadratic factor shows risk likely to revert over time (Month^2, $P < 0.001$)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.712

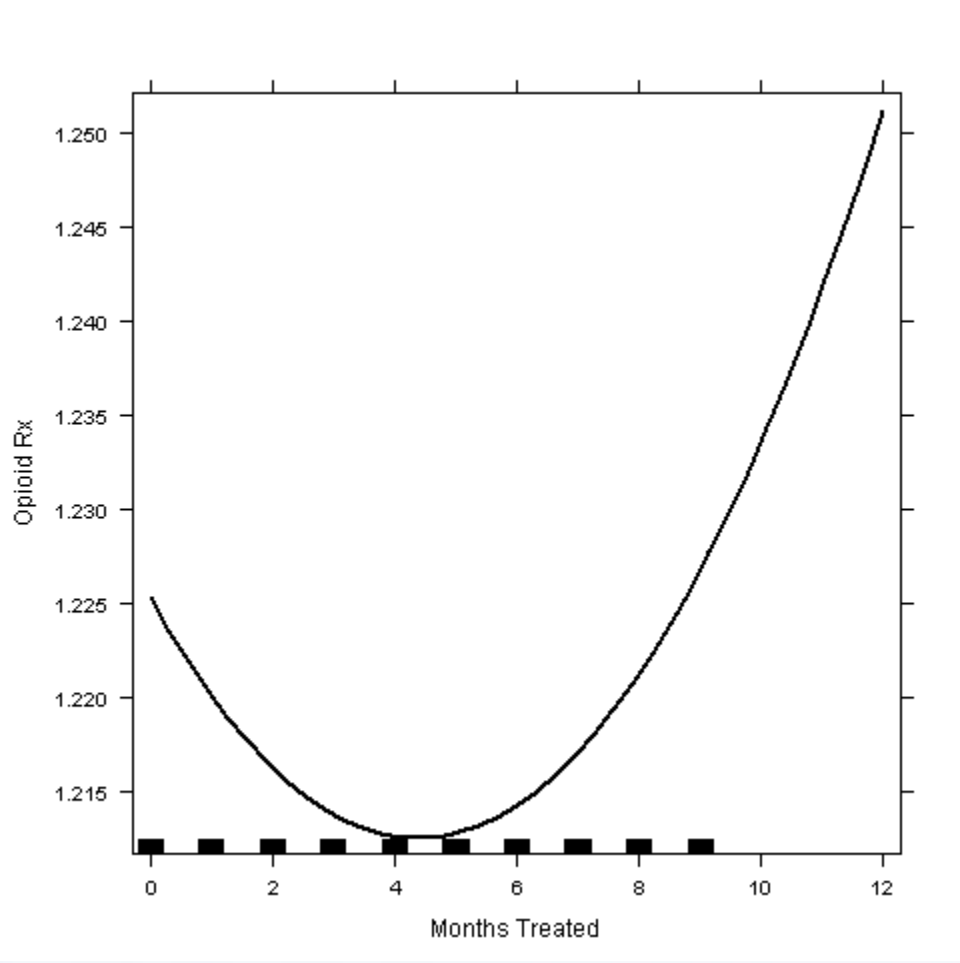
Concomitance



Month	Month^2	R^2	Adjusted R^2
P = 0.002	*P* = 0.009	0.867	0.855

- Linear treatment effect highly significant (Month, P = 0.002)
- Highly significant quadratic factor shows concomitance decrease expected to revert over time (Month^2, P = 0.009)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.855

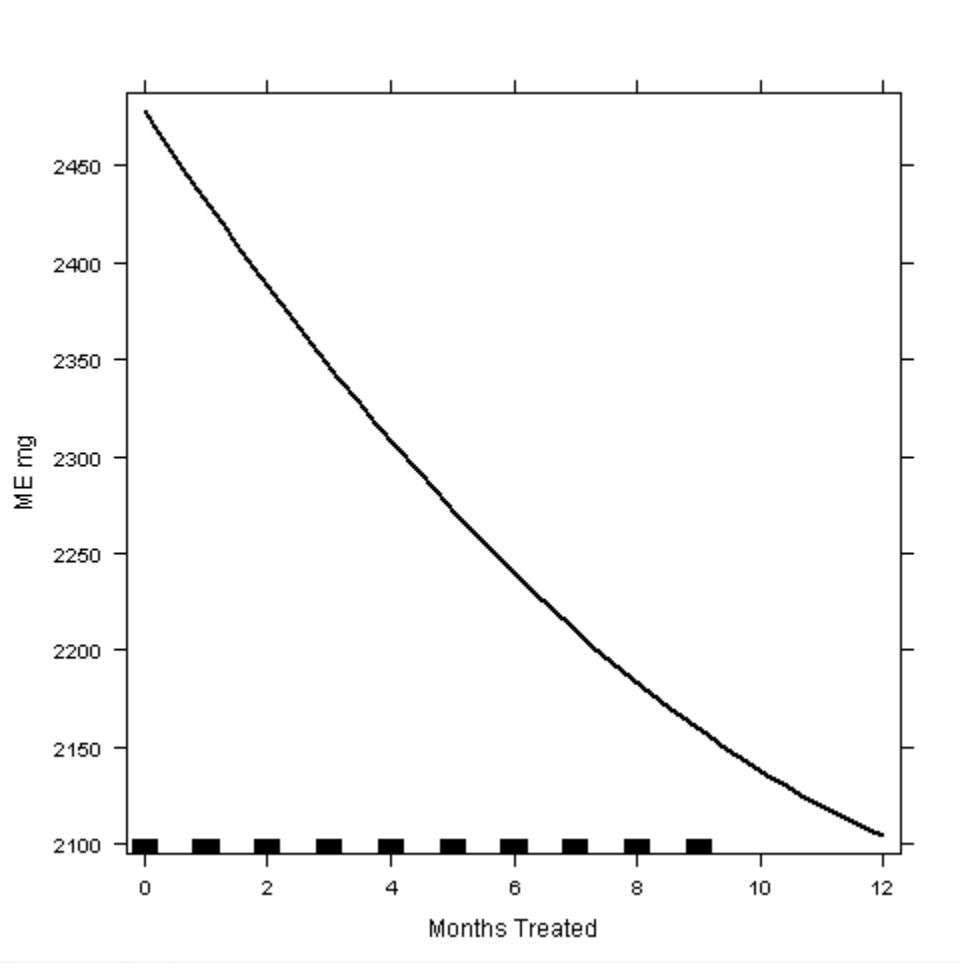
Opioid Rx / Prescriber / Month



Month	Month^2	R^2	Adjusted R^2
P = 0.818	P = 0.195	0.687	0.659

- Linear treatment effect is non-significant (Month, P = 0.818)
- Non-significant quadratic factor may indicate possibility of small decrease followed by reversion over time (Month^2, P = 0.195)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.659

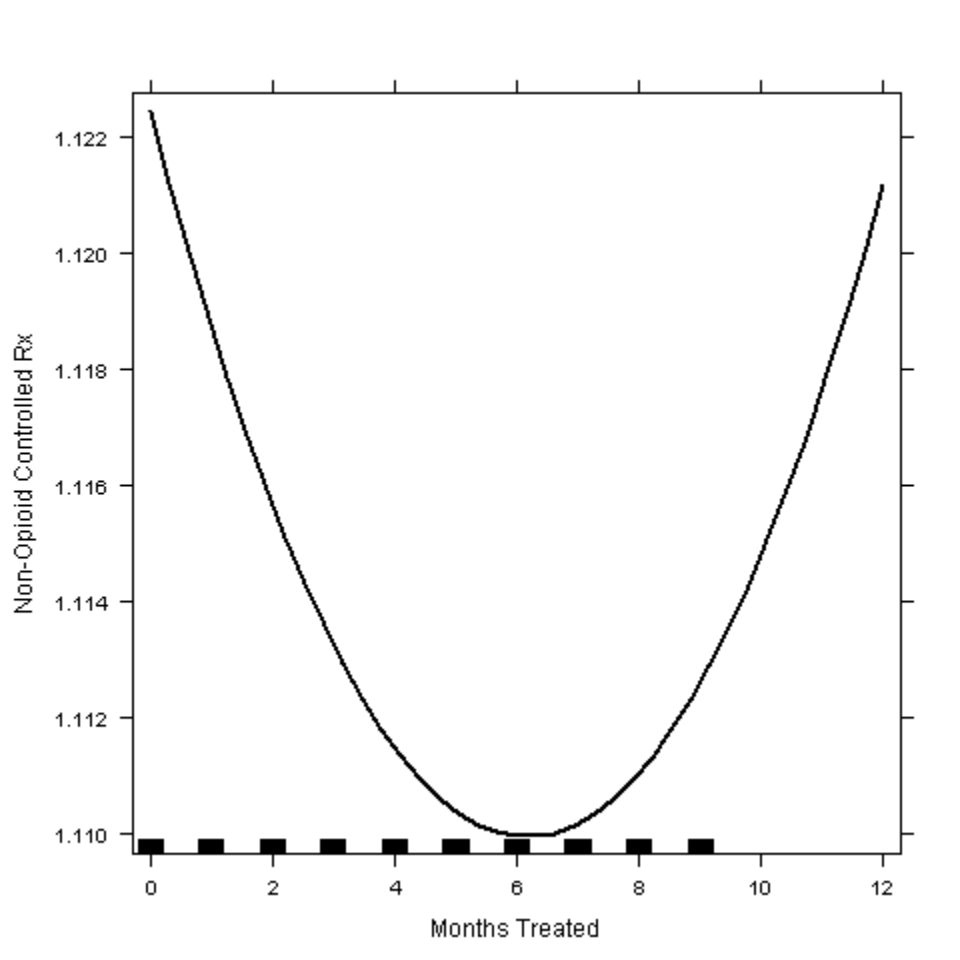
Morphine Equivalent / Prescriber / Month



Month	Month^2	R^2	Adjusted R^2
P = 0.020	P = 0.513	0.822	0.806

- Linear treatment effect for Morphine Equivalent mg is significant (Month, P = 0.020)
- Non-significant quadratic factor (Month^2, P = 0.513)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.806

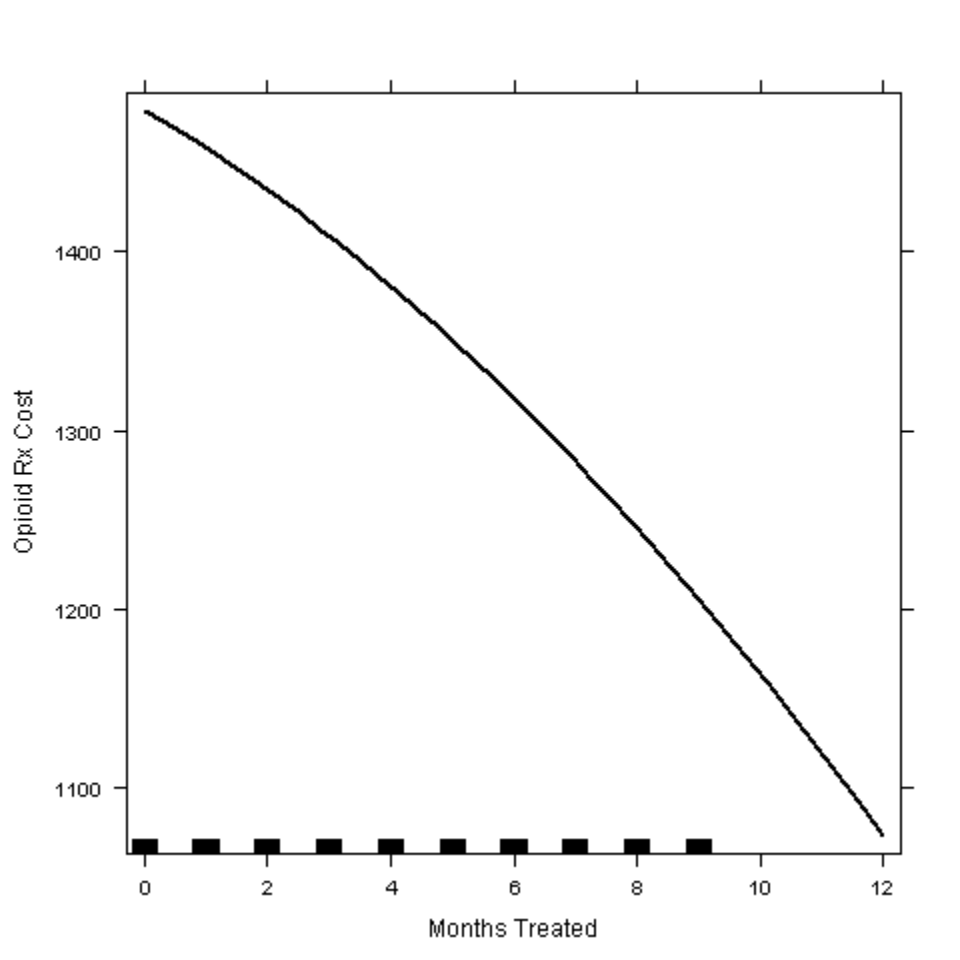
Other Non-Opioid Rx / Prescriber / Month



Month	Month^2	R^2	Adjusted R^2
$P = 0.633$	$P = 0.467$	0.560	0.519

- Linear treatment effect is non-significant (Month, $P = 0.818$)
- Treatment quadratic effect is non-significant (Month^2, $P = 0.467$)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.510

Opioid Rx Cost / Prescriber / Month

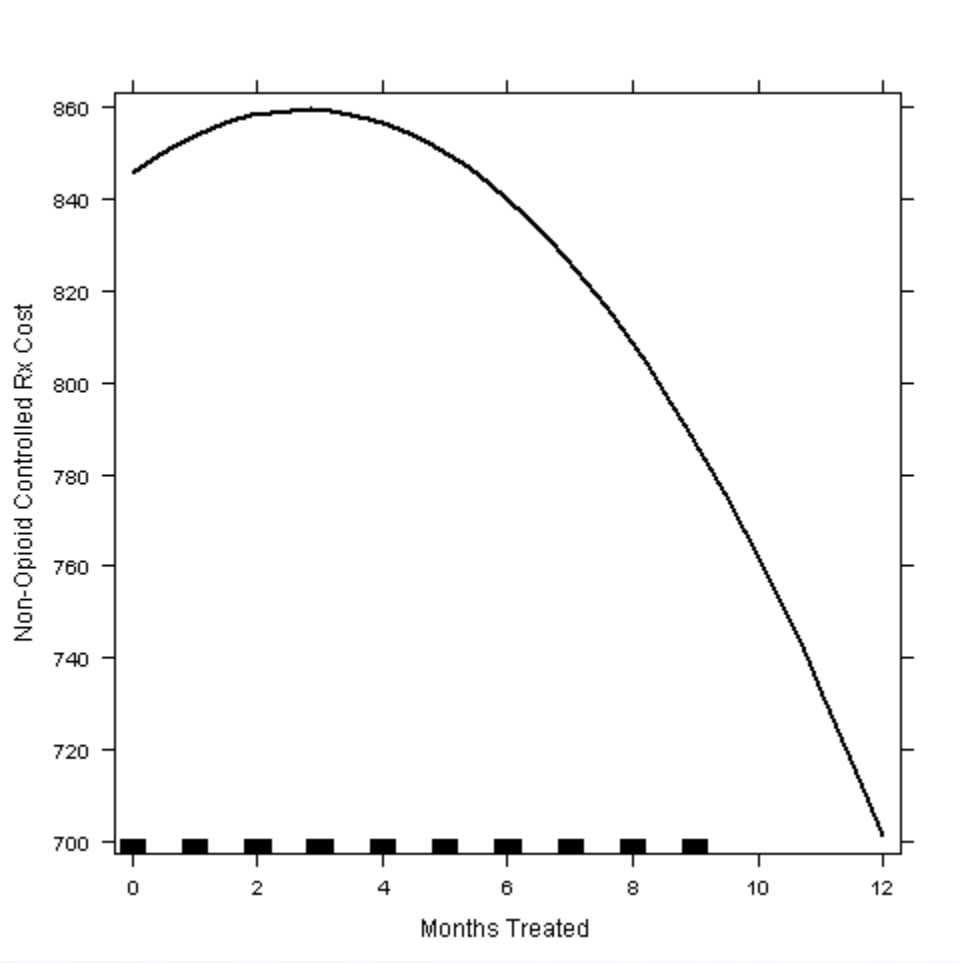


Month	Month^2	R^2	Adjusted R^2
P = 0.041	P = 0.536	0.944	0.939

- Linear treatment effect is significant (Month, P = 0.041)
- Non-significant quadratic factor (Month^2, P = 0.536)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.939

Cumulative 12-month Savings for 1,125 Prescribers is $2,596,189

Other Non-Opioid Rx Cost / Prescriber / Month

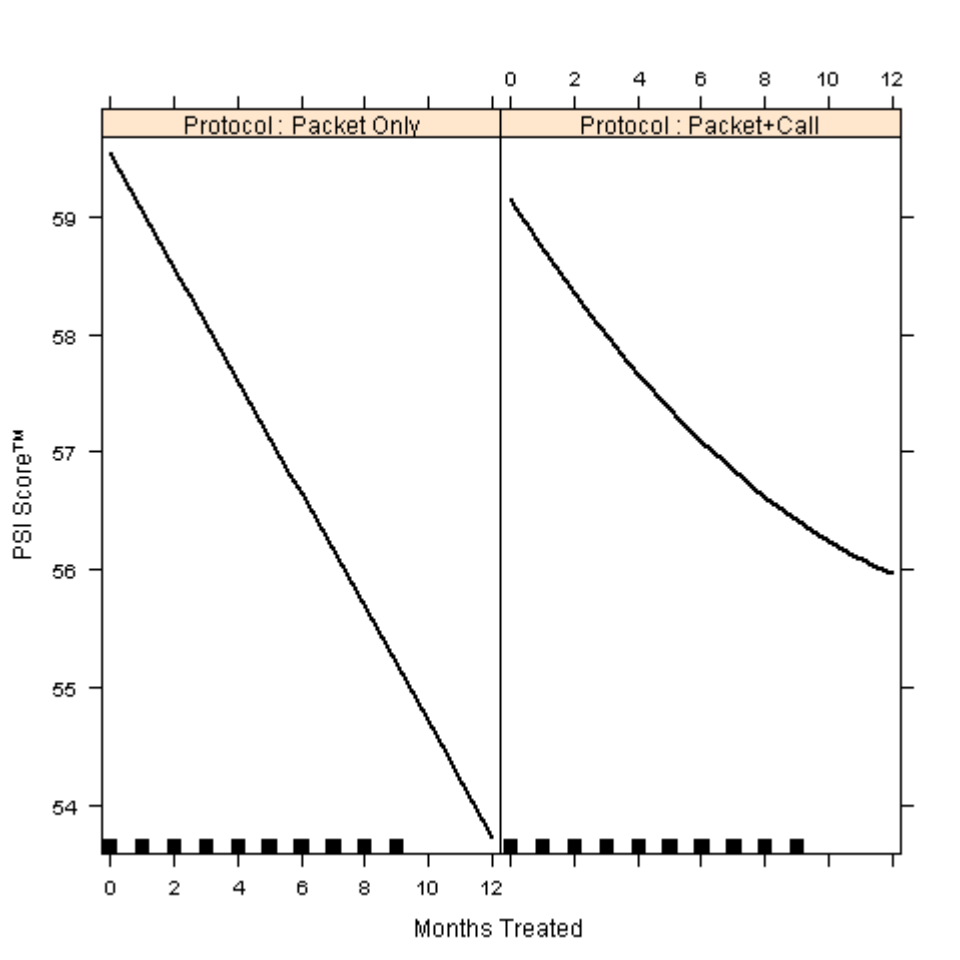


Month	Month^2	R^2	Adjusted R^2
P = 0.601	*P* = 0.045	0.857	0.844

- Linear treatment effect is non-significant (Month, P = 0.601)
- Significant quadratic effect may indicate minimal initial cost reduction followed by an increasing cost reduction starting in month 4 (Month^2, P = 0.045)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.844

Cumulative 12-month Savings for 1,125 Prescribers is $461,731

Packet Only vs. Packet+Call



Month	Month^2	R^2	Adjusted R^2
$P = 0.000$	$P = 0.216$	0.841	0.826

- Linear effect of receiving a call is highly significant and positive, meaning the call is associated with less decrease in PSI Score™ ($P < 0.001$)
- The quadratic effect of receiving a call is not significant ($P = 0.216$)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.826

Model Estimated Change in Monthly Rx Cost

Endpoint		Model Significance	P
PSI Score™	R	Yes	< 0.001
Multiple HCPs	R	Yes	< 0.001
Multiple Pharmacies	R	Yes	< 0.001
Concomitance	R	Yes	< 0.002
Opioid Prescription Claims	U	No	
Morphine Equivalent Dose (mg)	U	Yes	= 0.020

Legend: R = Risk Factor, U = Utilization Factor

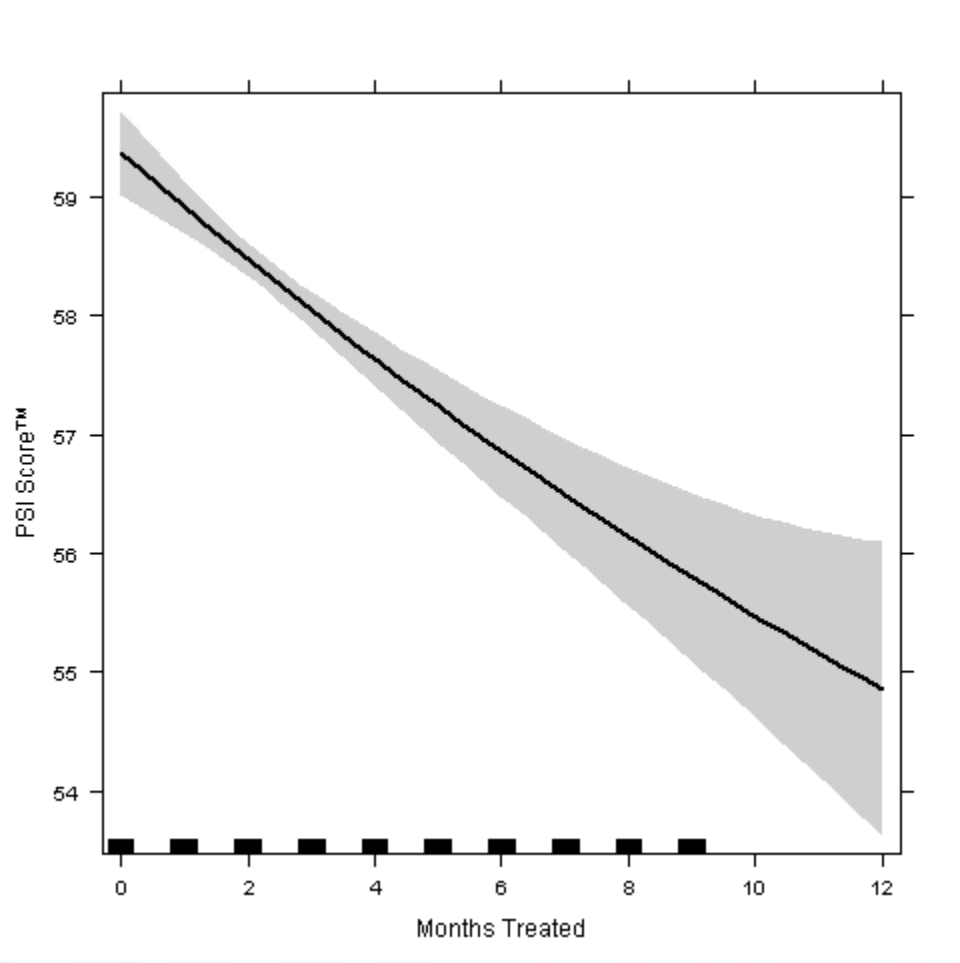
Cost	Model Significance	P	Savings
Opioid Rx Claims	Yes	= 0.041	$2,596,189
Non-opioid Rx Claims	Yes	= 0.045	$461,731
Benefit-to-Cost			4.4 : 1

Section 5

APPENDIX

OUTCOMES WITH CONFIDENCE INTERVAL BANDS

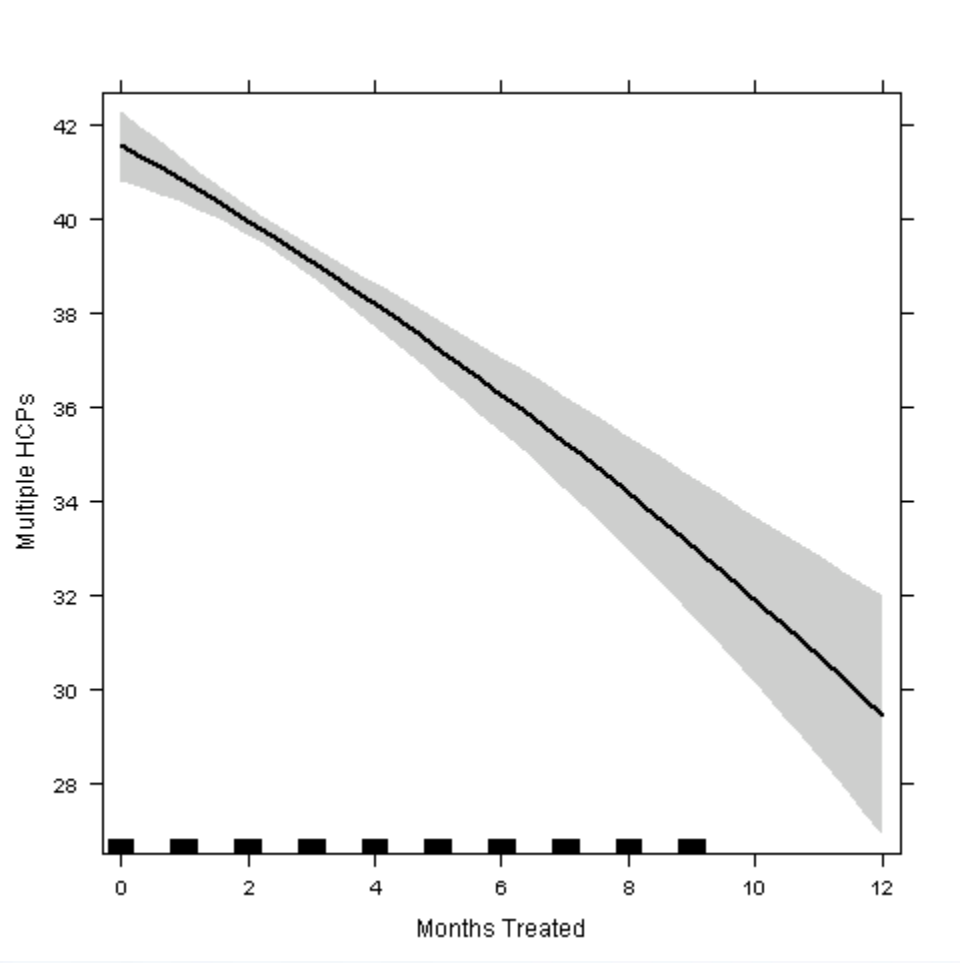
PSI Score™



Month	Month^2	R^2	Adjusted R^2
$P < 0.001$	$P = 0.368$	0.840	0.826

- Linear treatment effect highly significant (Month, $P < 0.001$)
- Slight, non-significant quadratic decrease in treatment over time (Month^2, $P = 0.368$)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.826

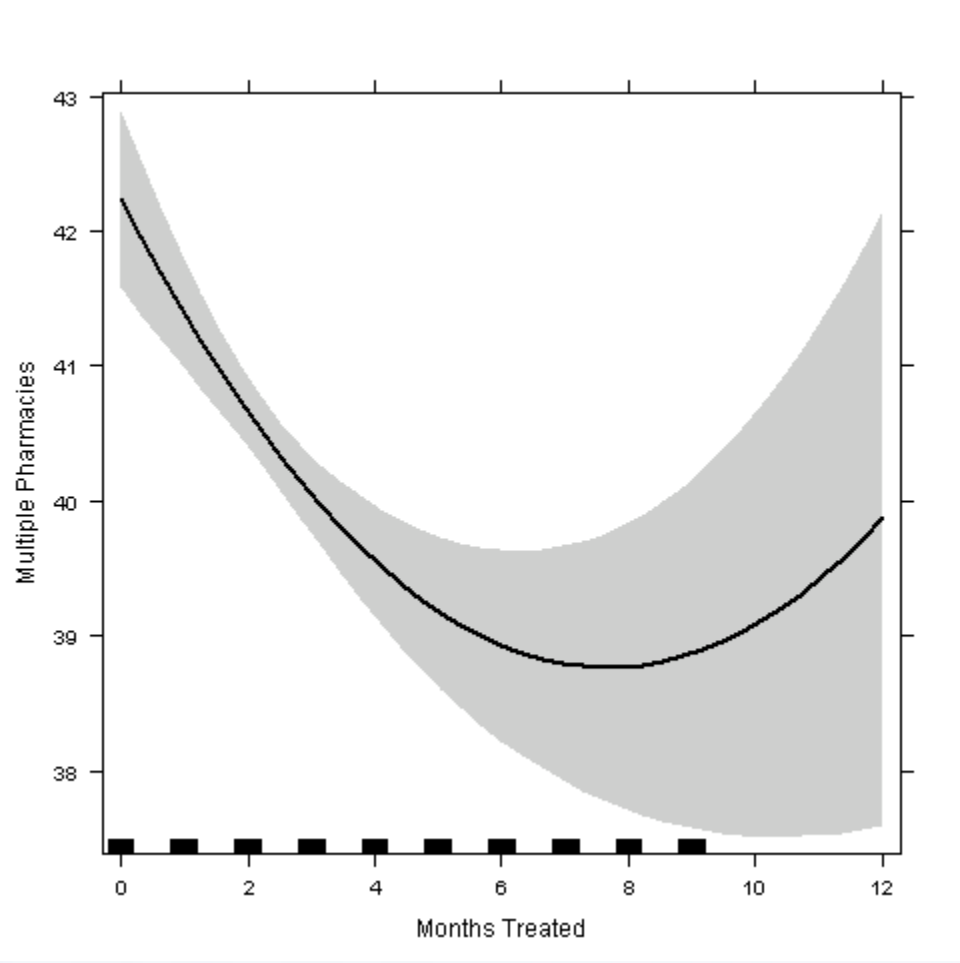
Multiple Prescribers



Month	Month^2	R^2	Adjusted R^2
$P < 0.001$	$P = 0.196$	0.763	0.741

- Linear treatment effect highly significant (Month, $P < 0.001$)
- Slight, non-significant increase in quadratic treatment over time (Month^2, P = 0.196)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.741

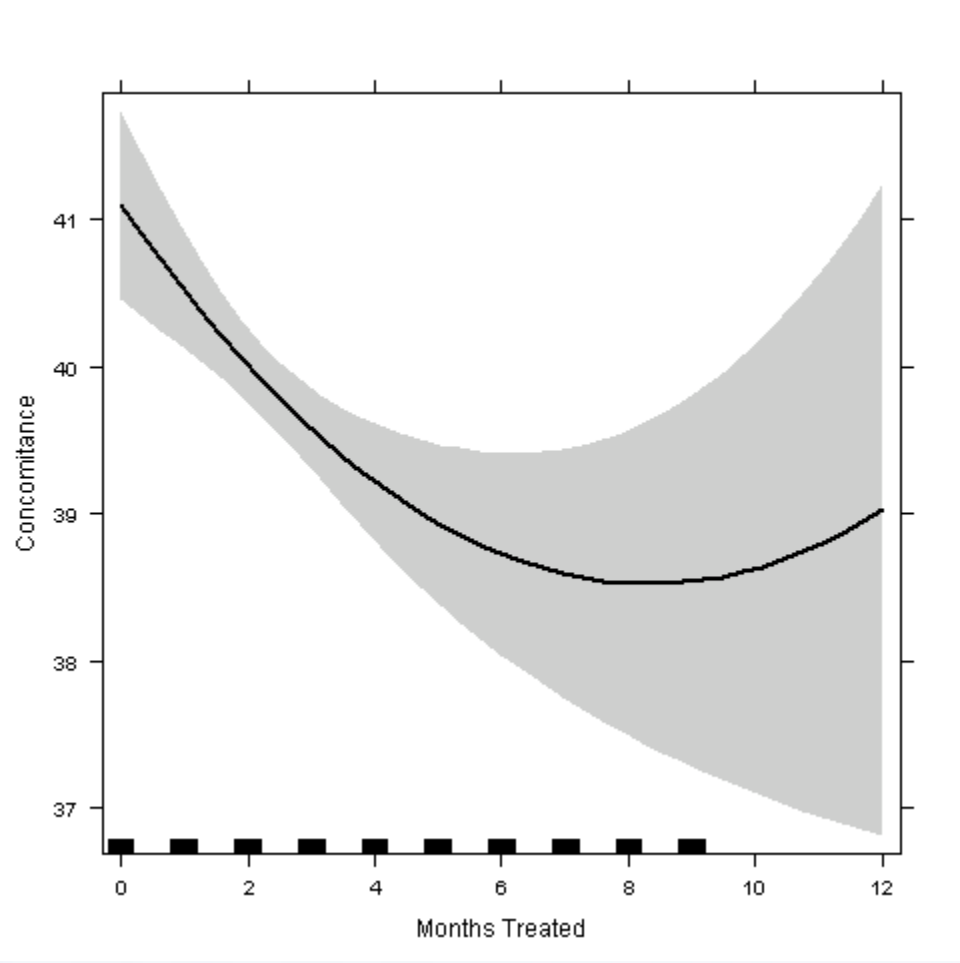
Multiple Pharmacies



Month	Month^2	R^2	Adjusted R^2
$P < 0.001$	$P < 0.001$	0.736	0.712

- Linear treatment effect highly significant (Month, $P < 0.001$)
- Highly significant quadratic factor shows risk likely to revert over time (Month^2, $P < 0.001$)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.712

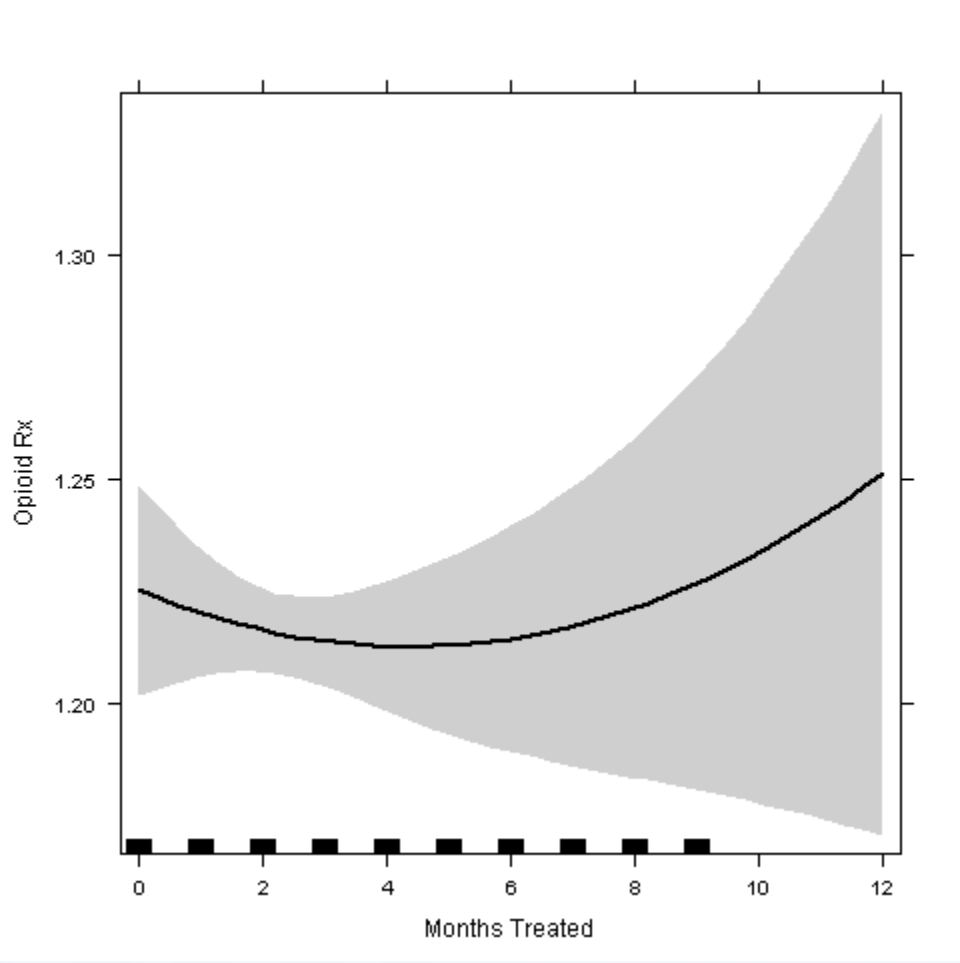
Concomitance



Month	Month^2	R^2	Adjusted R^2
P = 0.002	*P* = 0.009	0.867	0.855

- Linear treatment effect highly significant (Month, P = 0.002)
- Highly significant quadratic factor shows concomitance decrease expected to revert over time (Month^2, P = 0.009)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.855

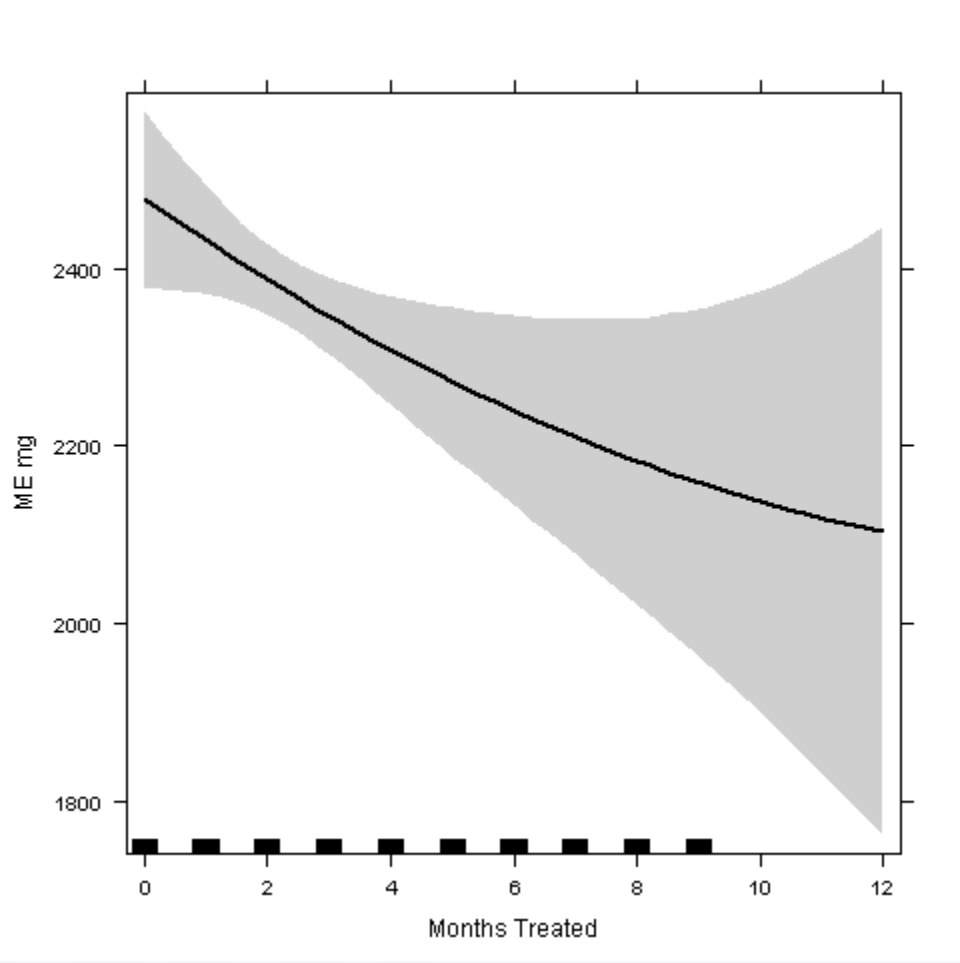
Opioid Rx / Prescriber / Month



Month	Month^2	R^2	Adjusted R^2
P = 0.818	P = 0.195	0.687	0.659

- Linear treatment effect is non-significant (Month, P = 0.818)
- Non-significant quadratic factor may indicate possibility of small decrease followed by reversion over time (Month^2, P = 0.195)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.659

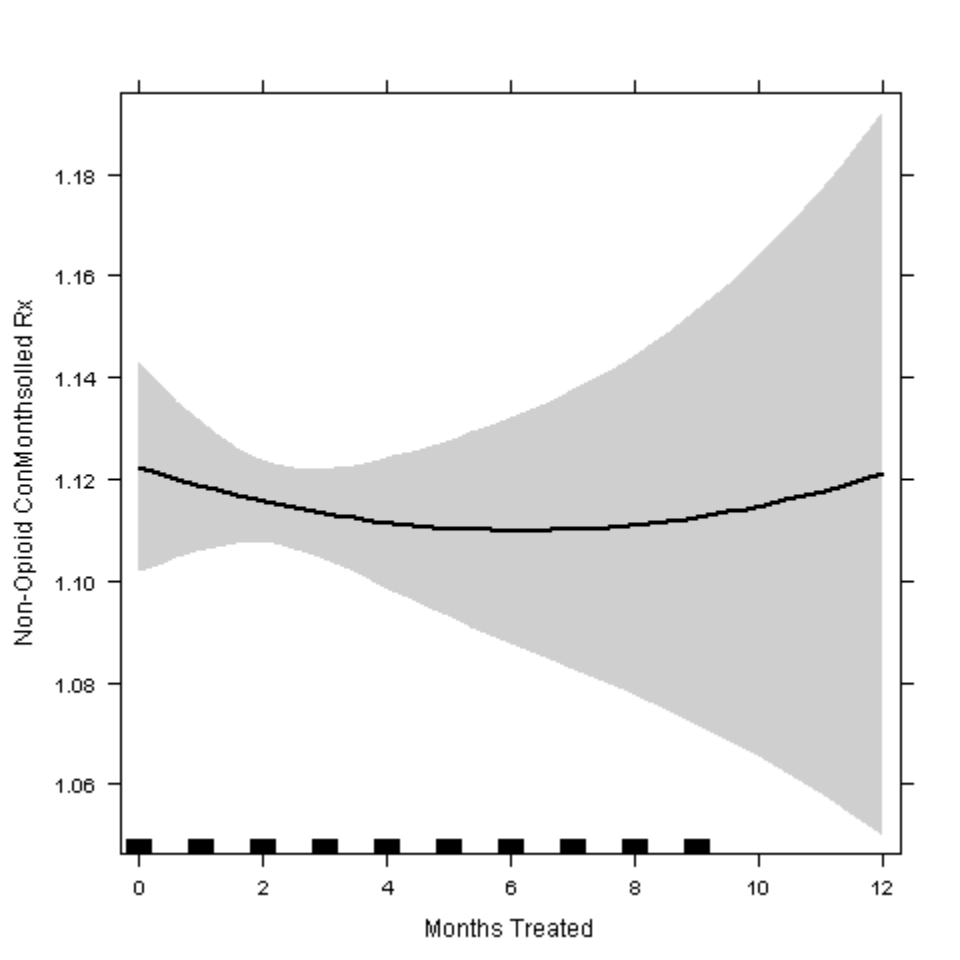
Morphine Equivalent / Prescriber / Month



Month	Month^2	R^2	Adjusted R^2
P = 0.020	P = 0.513	0.822	0.806

- Linear treatment effect for Morphine Equivalent mg is significant (Month, P = 0.020)
- Non-significant quadratic factor (Month^2, P = 0.513)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.806

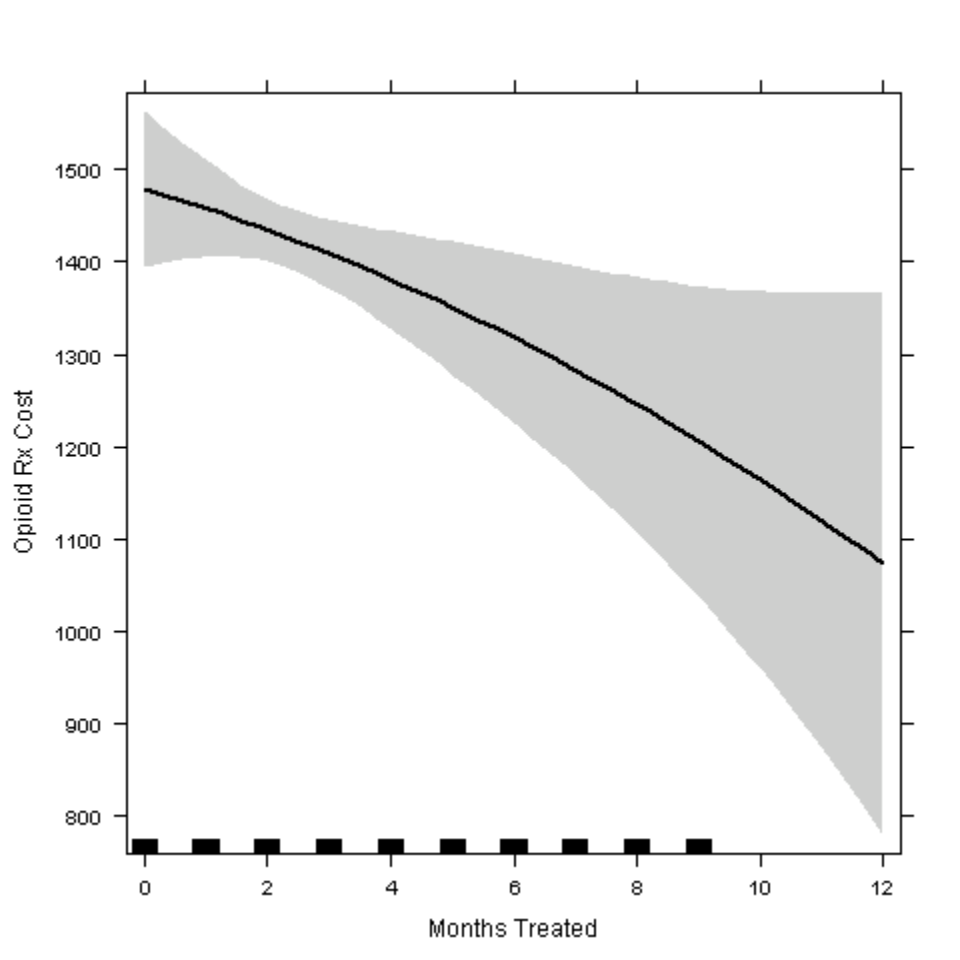
Other Non-Opioid Rx / Prescriber / Month



Month	Month^2	R^2	Adjusted R^2
P = 0.633	P = 0.467	0.560	0.519

- Linear treatment effect is non-significant (Month, P = 0.818)
- Treatment quadratic effect is non-significant (Month^2, P = 0.467)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.510

Opioid Rx Cost / Prescriber / Month

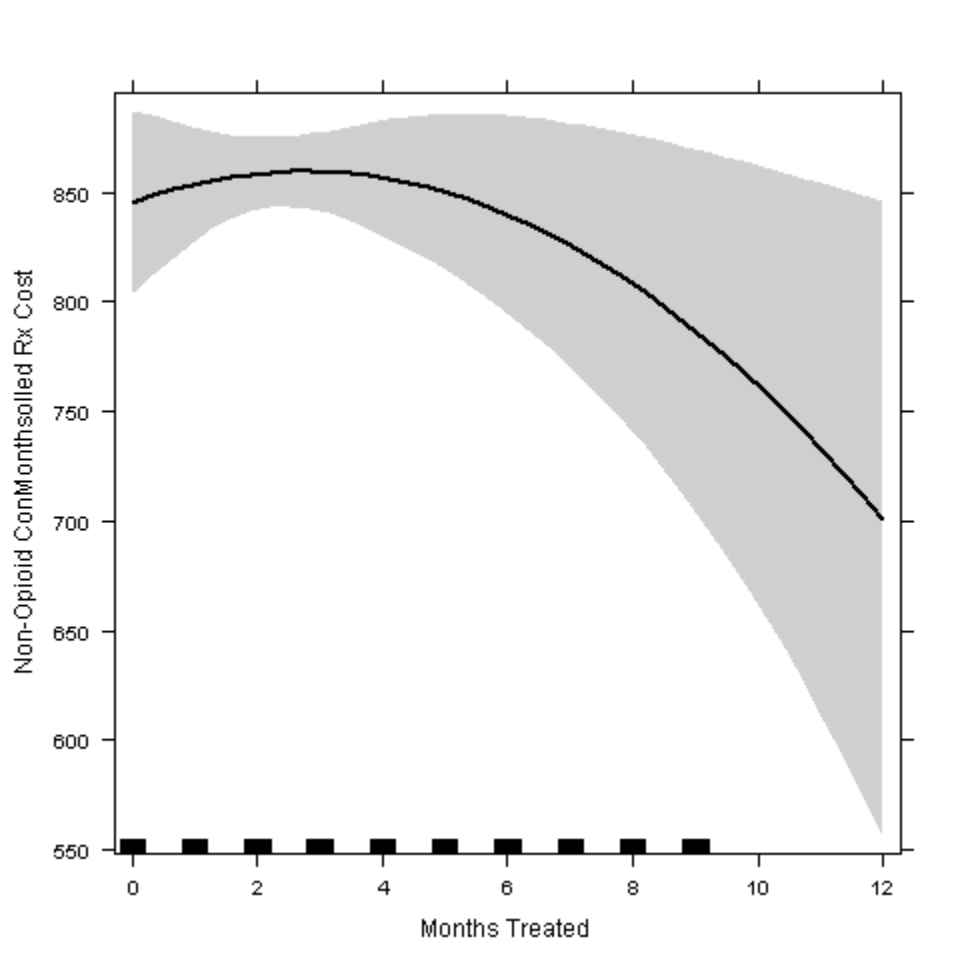


Month	Month^2	R^2	Adjusted R^2
P = 0.041	P = 0.536	0.944	0.939

- Linear treatment effect is significant (Month, P = 0.041)
- Non-significant quadratic factor (Month^2, P = 0.536)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.939

Cumulative 12-month Savings for 1,125 Prescribers is $2,596,189

Other Non-Opioid Rx Cost / Prescriber / Month

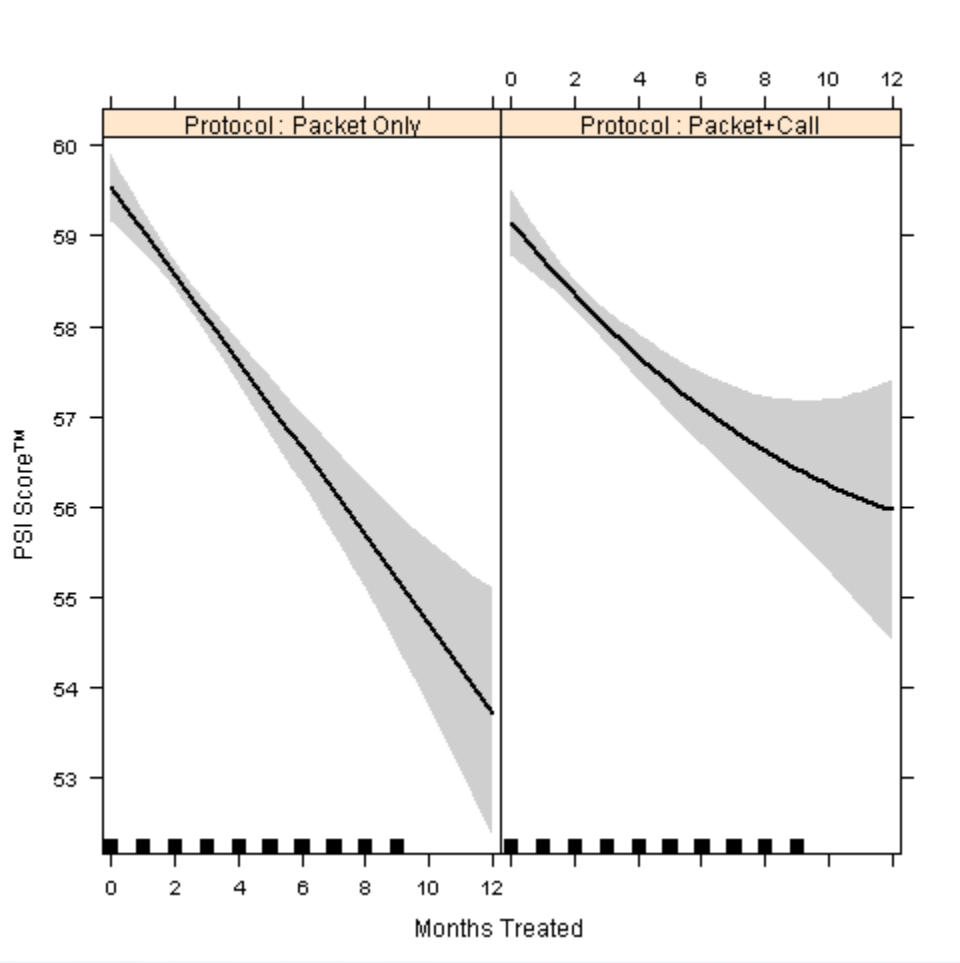


Month	Month^2	R^2	Adjusted R^2
P = 0.601	*P* = 0.045	0.857	0.844

- Linear treatment effect is non-significant (Month, P = 0.601)
- Significant quadratic effect may indicate minimal initial cost reduction followed by an increasing cost reduction starting in month 4 (Month^2, P = 0.045)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.844

Cumulative 12-month Savings for 1,125 Prescribers is $461,731

Packet Only vs. Packet+Call



Month	Month^2	R^2	Adjusted R^2
P = 0.000	P = 0.216	0.841	0.826

- Linear effect of receiving a call is highly significant and positive, meaning the call is associated with less decrease in PSI Score™ (Month, P = 0.000)
- The quadratic effect of receiving a call is not significant (Month^2, P = 0.216)
- After adjusting for complexity, R^2 (proportion of *variation* explained by model) is 0.826

References

1. CDC. Vital Signs: Overdoses of Prescription Opioid Pain Relievers—United States, 1999-2008. MMWR 2011; 60: 1-6
2. White AG, Birnbaum HG, Mareva MN, et al. Direct costs of opioid abuse in an insured population in the United States. J Manag Care Pharm. 2005;11(6):469-79.
3. HM1 Prescription Drug Abuse: The Road to Recovery. Clinical Perspectives from Rehabilitation. Gary Mills. Nov. 9, 2011. National Workers' Compensation Conference and Expo
4. Marsch, L.A., et al., Effects of infusion rate of intravenously administered morphine on physiological, psychomotor, and self-reported measures in humans. J Pharmacol Exp Ther, 2001. 299(3): p. 1056-65.
5. Weaver, M. and S. Schnoll, Abuse liability in opioid therapy for pain treatment in patients with an addiction history. Clin Journal Pain, 2002. 18(4 Suppl): p. S61-9.

Learning Assessment Question #1

According to a study published in 2005 by White AG et al, the average annual per patient health care cost in the population of opioid abusers as compared to non-opioid abusers was:

a. 8.3 - 8.7 higher
b. 1.9 - 2.5 higher
c. 3.2 - 5.1 lower
d. 12.3 - 12.9 higher

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Learning Assessment Question #2

Which of the following prescriber-centric risk factors commonly appears in a Top 3 list?

a. Multiple prescribers
b. Suboxone® (buprenorphine and naloxone sublingual film) volume
c. Opioid concomitance with *benzodiazepine* or *carisoprodol*
d. Multiple pharmacies

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Learning Assessment Question #3

Which of the following is the **least** useful strategy in a prescriber-centric risk scoring program?

a. Identify/stratify in population and by specialty peers
b. Predict risky prescribers by identifying trends
c. Identify each prescriber's top 3 risk behaviors
d. Monitor prescriber behavior once and stop

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Learning Assessment Question #4

According to the Care Continuum Alliance, the method with the highest strength of attribution and adjustment for evaluating the effectiveness of a clinical intervention program is:

a. Historic control
b. Randomized control trial (RCT)
c. Non-experimental control group
d. Pre-post

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Bonus Question #5

In the formula

$$Y_{it} = \alpha_i + \gamma_t + \beta_1 X_{it} + \beta_2 X_{it}^2 + \varepsilon_{it}$$

the ε_{it} term is a measure of:

a. Error
b. Risk
c. Reward
d. Cost

TEXT TO 22333

a. XXXXX
b. XXXXX
c. XXXXX
d. XXXXX

Questions?