



# **Measuring the Benefit of Pharmacist Provided Medication Therapy Management (MTM) Services within Medicare Part D: A Multi-Year Analysis**

Mitchell J. Barnett  
Brand A. Newland  
Thomas N. Taylor  
(Channel 51)

# Disclosure

---

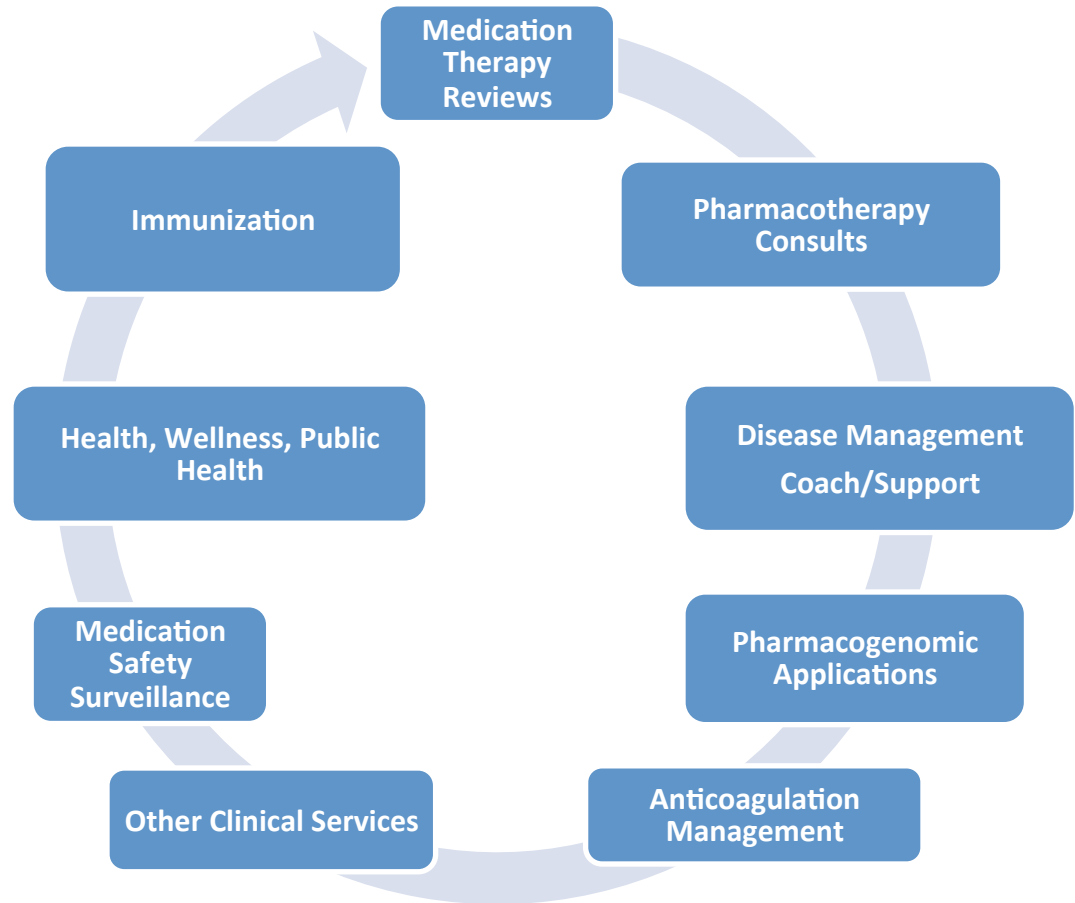
“Mitchell Barnett declares no conflicts of interest or financial interests in any product or service mentioned in this presentation, including grants, employment, gifts, stock holdings, or honoraria.”

“Thomas Taylor declares no conflicts of interest or financial interests in any product or service mentioned in this presentation, including grants, employment, gifts, stock holdings, or honoraria.”

Brand Newland is Vice President of Outcomes Pharmaceutical Health Care.

# Medication Therapy Management (MTM)

Medication therapy management (MTM) is a disease management service or group of services that optimize therapeutic outcomes for individual patients



<http://www.pharmacist.com/AM/Template.cfm?Section=MTM&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=87&ContentID=22413>

# Medication Therapy Management Programs

- § 423.153(d) required Part D sponsors to establish an MTM Program designed to optimize therapeutic outcomes for targeted beneficiaries by improving medication use and reducing adverse drug events
  - Reduce the risk of ADE's by education and counseling
  - Increase adherence to prescription medications
  - Detect patterns of overuse and underuse of medications

Centers for Medicare & Medicaid Services. Medicare Prescription Drug Benefit Final Rule: 42 CFR Parts 400, 403, 411, 417, and 423 Medicare Program. *Federal Register*, vol. 70, no. 18. January 28, 2005.

# What is known about MTM services

- MTM services:
  - Have increased dramatically (since Part D)
  - Have higher levels of patient satisfaction when delivered “face-to-face” in the patient’s pharmacy
  - May show greatest benefit when focusing on patients with specific disease states or problems
- Adoption of MTM services however, varies greatly in prevalence, quality, outcomes, types of patients and percentage of eligible patients receiving MTM

Lauffenburger et al . Am J Geriatr Pharmacother. 2012 70, no. 18 (e-pub ahead of print).  
Kucukarslan et al. Am J Health-Syst Pharm. 2011; 68:335-45

# Background

---

- Important to understand why some candidates are not receiving MTM services and to better understand the consequences of MTM interventions
- One of the challenges, however, in evaluating MTM services is the lack of adequate controls; for instance, it is well known that individuals receiving MTM have more chronic conditions than a typical patient
- As such, comparisons of patients receiving MTM services versus those who have not are likely to be subject to selection bias

## Background Cont...

---

- One approach for dealing with this selection bias is exact matching. Unfortunately, when there are numerous characteristics that predict who will receive MTM, exact matching becomes difficult
- Propensity-score matching has become increasingly popular in observational studies to address this issue
- Identifying reasons why some patients receive MTM services and the impact of MTM services on utilization measures has broad reaching policy implications

# Learning Objectives

---

- List patient-level factors associated with utilization of MTM services among Medicare Part-D Patients
- Describe the impact of delivered MTM services on patient costs (copays) in a sub-cohort of diabetic Medicare Part-D patients
- An underlying objective is to characterize MTM services provided over a two-year time frame to a large cohort of MTM eligible (>50,000) patients



# Data Sources: MTM Intervention and Rx Claims

---

- Claims from a Midwest state
  - MTM intervention claims over 12 month period: January 1, 2010 through December 31, 2010
  - Outpatient Rx Claims from 36 month period: January 1, 2009 through December 31, 2011
- All patients were dual eligible (Medicare & Medicaid)
- All patients eligible to receive face-to-face MTM provided by a trained community pharmacist
- All claims authenticated during adjudication

# Data Extraction

---

- Rx Data extracted from outpatient claims:
  - Patient ID, Prescriber ID, Pharmacy ID
  - NDC & Drug Name
  - Date dispensed
  - Patient copay, amount paid by plan
  - Metric supply, days supply
- Data extracted from community pharmacy intervention claims:
  - Patient ID
  - Date of service
  - Specific information about the MTM service provided

# Prescriptions to Chronic Conditions

---

Mapped RX claims into 12 chronic conditions

- NDC to VA/AHFS drug class
- VA/AHFS drug class to therapeutic class
- Therapeutic class to chronic condition

**Asthma**

**CHF**

**Coagulation**

**COPD**

**Depression**

**Diabetes**

**Dyslipidemia**

**GERD/PUD**

**HTN**

**Osteoarthritis**

**Osteoporosis**

**Rheumatoid Arthritis**

# MTM Provider Network

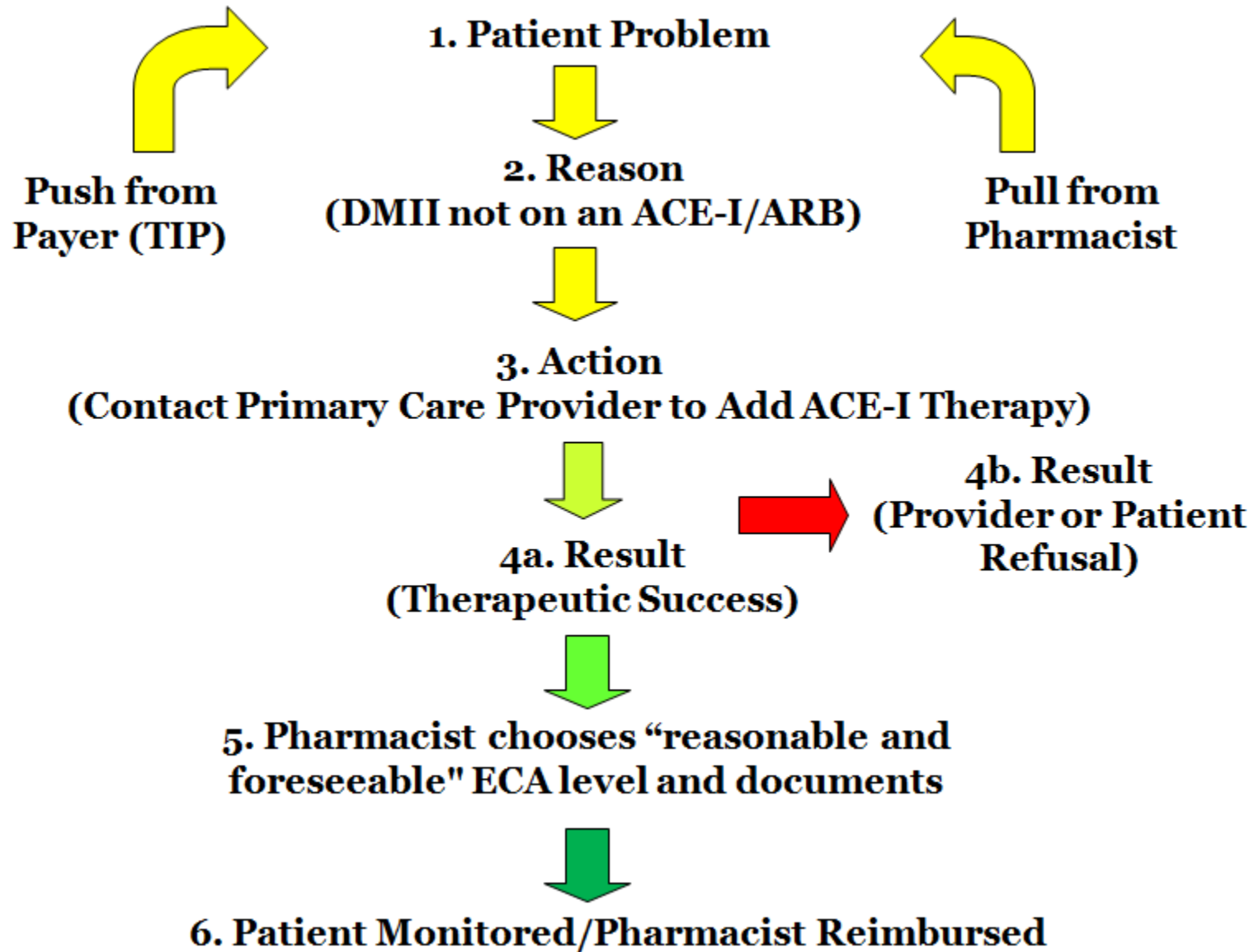
- Any willing pharmacy provider
  - Approximately 55,866 community pharmacies in US
  - Nearly all Americans (92%) live within 5 miles of a community retail pharmacy\*
- Two steps to join:
  - MTM Network Agreement
  - Pharmacist Training (1 hour, online, no cost)
- Chain, independent, consultant, health-system pharmacy providers

\*National Association of Chain Drug Stores, Industry Profile, 2008-09

# Covered MTM Services

---

- Comprehensive Medication Review
  - By appointment
  - Once annual
- Prescriber Consultation
  - Cost, Quality, Safety
- Patient Compliance Consultation
  - Non-Adherence, Administration/Technique
- Patient Education & Monitoring
- Prescriber and Patient Refusals are tracked (Interventions Offered)



# MTM Claim Online Documentation

CURRENT PHARMACY

PHARMACY A  
1111111

CHANGE PHARMACY +

CLAIM SUBMISSION

▶ Submit Claim

▶ TIPs

PATIENTS

REPORTS

CALENDAR

MAILBOX (1)

MY PROFILE

TOOLS

TRAINING

Copyright © 2007. Outcomes  
Pharmaceutical Health Care™

Web design and development  
by Spindustry Interactive™

CLAIM SUBMISSION

Patient:	SMITH, JOSEPH
Patient ID:	12345678901
Gender/DOB:	M - 11/16/1935
Phone:	1112223333
Enrollment Date:	01/01/2004

Note: Fields in orange are required

Encounter Date: 09/14/2007 (mm/dd/yyyy format)

I. Indication For Service (Reason)

100 - COMPLEX DRUG THERAPY

II. Professional Service (Action)

200 - COMPREHENSIVE MED REVIEW (CMR)

III. Outcome Of Service (Result)

300 - CMR WITH ENCOUNTER

IV. Estimated Cost Avoidance (ECA)

LEVEL 1 - IMPROVED QUALITY OF CARE

☐ Check box if claim tied to Comprehensive Medication Review (CMR)

NEXT

RETURN TO DASHBOARD

# Study Sample

---

- 4.8 million RX claims in 2010
  - 84,959 unique patients
  - 76,627 unique patients over age 65
- 18,002 documented MTM interventions in 2010
  - 10,369 unique patients
  - 9,588 unique patients over age 65
- All individuals with at least one prescribed medicine in the previous year (2009) and subsequent year (2011) served as study population



# Methodology

---

- Logistic regression\* using age, gender, number of different medications, previous year Rx drug expenditures and indicator variables reflecting chronic conditions (diabetes, hypertension, asthma, etc) predicted odds of receiving MTM during 2010
- Controls matched to cases using propensity scoring methodology
- Resulting set of cases and controls balanced in terms of the frequency of characteristics included in estimated logistic regression

\*backwards selection

# Propensity Scoring

---

- The propensity-scoring method first estimates the likelihood that someone will receive an intervention of interest (i.e., an MTM encounter)
- Actual cases (patients with an MTM encounter) are then matched with those patients who have a very similar likelihood of receiving the intervention (MTM encounter), but did not

# Analytical Strategy

---

- The date of the first observed MTM encounter defined as the index date
- Cases and controls followed for 12 months after the MTM index date. Index date for controls defined as the index date for the corresponding matched case
- Subgroup analysis on individuals with diabetes
  - Cases and propensity-score matched controls selected using method similar to that for the full sample
  - Outcome measures same as full sample with addition of medication adherence measure defined by percent of days covered (PDC)

# Statistical Analysis

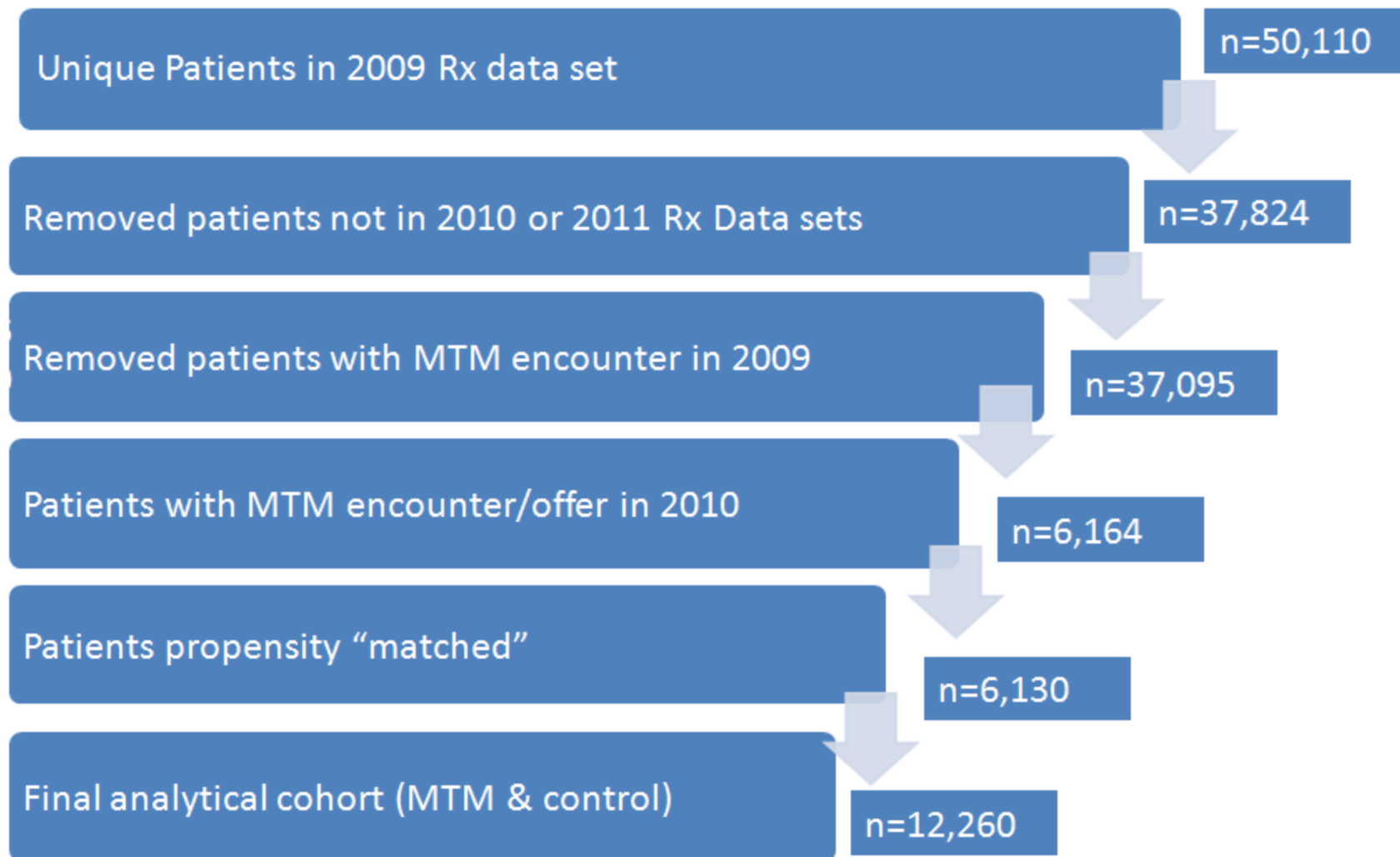
---

- Outcome measures include the mean number of Rx and mean total expenditures on prescription drugs over 12 months following MTM encounter (index date); along with percentage on “inappropriate” (i.e., Beers) or “top-10” costly medication
- Between group comparisons of categorical variables made using the Chi-square test and comparisons of continuous variables analyzed using Student's t-tests

# Patient Characteristics (Overall for 2010)

Type of Plan	Medicare Advantage (Dual Eligible)
Enrollment Restriction/Inclusion Criteria	Total Population
Geographical Region	Midwest
Date Range of Claims	January 2010 - December 2010
Number of Rx Claims	4,813,172
Unique Number of Rx Patients	84,959
Mean Annual Number of RXs per Patient $\pm$ SD	56.7 $\pm$ 447.6
Mean Age, years $\pm$ SD	73.0 $\pm$ 9.3
Age Range, years	20 - 103
Patients Age 65 or over N, (%)	76,627 (90.2%)
Male N, (%)	34,893 (41.1%)
Mean Annual RX Costs (Patient) $\pm$ SD	\$3,222 $\pm$ 2,258

# Study Cohort



## MTM vs. No MTM (Unmatched) - 2010 cohort

	MTM Encounter (N=6,164)	No MTM Encounter (N=30,931)	p - Value
Mean Age, years $\pm$ SD	75.2 $\pm$ 8.3	75.4 $\pm$ 9.0	0.06
Number N , (%) 65 or over	5,925 (96.1%)	29,768 (96.3%)	0.45
Male N, (%)	2,403 (39.0%)	11,619 (37.6%)	0.02
Number N, (%) on Top 10 Costly Drug	2,311 (37.5%)	8,494 (27.5%)	<0.01
Number N, (%) on Beers Criteria Drug	302 (4.9%)	1,273 (4.1%)	0.04
Mean Number Chronic Condition Patient $\pm$ SD	2.8 $\pm$ 2.0	2.4 $\pm$ 2.0	<0.01

# Results-MTM vs. No MTM (Propensity Matched)

	Cases (N=6,130)	Controls (N=6,130)	p - Value
<b>Mean Age, years <math>\pm</math> SD</b>	<b>75.2 <math>\pm</math> 8.3</b>	<b>75.2 <math>\pm</math> 8.7</b>	<b>0.66</b>
<b>Number N , (%) 65 or over</b>	<b>5,893 (96.1%)</b>	<b>5,885 (96.0%)</b>	<b>0.71</b>
<b>Male N, (%)</b>	<b>2,392 (39.0%)</b>	<b>2,454 (40.0%)</b>	<b>0.25</b>
<b>Number N, (%) on Top 10 Costly Drug</b>	<b>2,302 (37.6%)</b>	<b>2,323 (37.9%)</b>	<b>0.70</b>
<b>Number N, (%) on Beers Criteria Drug</b>	<b>247 (4.0%)</b>	<b>247 (4.0%)</b>	<b>0.99</b>
<b>Mean Number Chronic Condition Patient <math>\pm</math> SD</b>	<b>2.8 <math>\pm</math> 2.0</b>	<b>2.8 <math>\pm</math> 2.0</b>	<b>0.41</b>



# Outcome Results after Index-All Patients (Interventions Offered)

	Cases MTM Encounter (n=6,130)	Controls No MTM Encounter (n=6,130)	P Value
Mean Number of Rxs $\pm$ SD	58.9 $\pm$ 46.5	55.1 $\pm$ 48.9	<0.01
Annual drug \$ $\pm$ SD	\$3,316 $\pm$ 7,349	\$2,918 $\pm$ 6,417	0.02
Percentage on inappropriate (Beers) medication	6.1%	6.0%	0.88
Percentage on “Top 10” costly drug	46.0%	44.9%	0.23

Results are for 12 months after  
MTM encounter

# Outcome Results after Index-Diabetic Cohort (Interventions Offered)

	Cases MTM Encounter (n=1,581)	Controls No MTM Encounter (n=1,591)	P Value
Mean Number of Rxs $\pm$ SD	81.1 $\pm$ 54.9	81.0 $\pm$ 59.4	0.81
Member Cost (Copay), \$ $\pm$ SD	\$ 693 $\pm$ 823	\$765 $\pm$ SD 897	0.04
Percentage on inappropriate (Beers) medication	6.2%	7.0%	0.88
Percentage on “Top 10” costly drug	48.3%	49.9%	0.23

Results are for 12 months after  
MTM encounter

# Medication Adherence-Diabetic Cohort

## (Interventions Offered)

	Cases MTM Encounter (n=1,581)	Controls No MTM Encounter (n=1,581)	P Value
Percent of Days Covered (PDC) % $\pm$ SD	67.7 $\pm$ 23.6	64.4 $\pm$ 25.9	<0.01

Results are for 12 months after  
MTM encounter

# Outcome Results after Index-All Patients (Interventions Accepted)

	Cases MTM Encounter	Controls No MTM Encounter	P Value
Mean Number of Rxs $\pm$ SD	57.2 $\pm$ 45.9	54.4 $\pm$ 48.9	0.02
Annual drug \$ $\pm$ SD	\$2,963 $\pm$ 6,410	\$2,859 $\pm$ 7,016	0.54
Percentage on inappropriate (Beers) medication	6.8%	6.1%	0.29
Percentage on “Top 10” costly drug	41.9%	45.4%	<0.01

Results are for 12 months after  
MTM encounter

# Outcome Results after Index-Diabetic Cohort (Interventions Accepted)

	Cases MTM Encounter	Controls No MTM Encounter	P Value
Mean Number of Rx's $\pm$ SD	81.2 $\pm$ 55.4	80.0 $\pm$ 59.0	0.89
Member Cost (Copay), \$ $\pm$ SD	\$ 740 $\pm$ 836	\$773 $\pm$ 794	0.04
Percentage on inappropriate (Beers) medication	6.0%	8.2%	0.13
Percentage on "Top 10" costly drug	45.7%	53.0%	<0.01

Results are for 12 months after  
MTM encounter

# Medication Adherence-Diabetic Cohort

## (Interventions Accepted)

	Cases MTM Encounter	Controls No MTM Encounter	P Value
Percent of Days Covered (PDC) % $\pm$ SD	67.4 $\pm$ 24.4	65.5 $\pm$ 25.4	0.06

Results are for 12 months after  
MTM encounter

# Outcome Results after Index-Cost Analysis (Interventions Accepted)

	Cases MTM Encounter	Controls No MTM Encounter	P Value
Mean Number of Rxs $\pm$ SD	59.2 $\pm$ 47.4	54.8 $\pm$ 45.7	0.03
Annual drug \$ $\pm$ SD	\$2979 $\pm$ 6,216	\$3,021 $\pm$ 6,562	0.86
Percentage on inappropriate (Beers) medication	5.6%	7.1%	0.17
Percentage on “Top 10” costly drug	43.6%	52.6%	<0.01

Results are for 12 months after  
MTM encounter

# Summary

---

- Patient factors predicting MTM services include: being on a “top-10” costly and/or potentially inappropriate med, and/or having one or more comorbid conditions, i.e., diabetes, dyslipidemia, CHF, hypertension, COPD, et al.
- MTM may decrease patient costs (i.e., Rx copays) in certain populations
- MTM may increase medication adherence (as measured by percent of days covered) in certain patient populations



# Potential Barriers to MTM

---

- Limited access to clinical information
- Geographic separation of physician and pharmacist.
- Retrospective interventions may be less efficient than interventions done at time of prescribing
- Physicians not informed of MTM (communication)
- Lack of acceptance of pharmacist interventions
- Patient education
- Lack of commitment by pharmacists

# Limitations

---

- No inpatient, outpatient claims data for follow up (lacking hard outcomes points)
- No ICD-9 codes (“gold standard” behind chart review for identifying primary and comorbid conditions)
- Single Geographical region (Midwest State) may limit generalizability of some conclusions
- Propensity scoring methodology only controls for variables observed in the data. It does not control for selection bias associated with unobserved variables

# Conclusions

---

- Pharmacists providing MTM are targeting the right patients (i.e., those with high cost, potentially inappropriate medications, complex therapies)
- Although limited, preliminary results point to significant patient differences related to the provision of MTM services and begin to provide an understanding of the benefits of MTM interventions

# Future Research Directions

---

- Combine data with inpatient and outpatient claims:
  - Potential better identification of comorbid conditions
  - More “robust” measure of cost savings and other outcomes (i.e., STAR)
- Additional geographical areas to look at more diverse patient and provider populations along with a longer total timeframe, shorter windows
- Look at impact of provider or patient refusals
- Look at outcomes within additional disease states and by specific MTM services

# Acknowledgements

---





- Jessica Frank, PharmD
  - Vice President, Outcomes
- Katherine Knapp, PhD
  - Dean, Touro University College of Pharmacy California
- Tod Kumbera
  - Director of IT, Outcomes



# Assessments

# Assessment Question 1

Patient-level factors associated with utilization of MTM services in Part D patients include:

-  1/A Being on a “top-10” costly medication
-  2/B Being on a potentially “inappropriate” (i.e., Beers) medication
-  3/C Having chronic conditions (e.g., dyslipidemia, diabetes, hypertension, et al)
-  4/D All of the above

## Assessment Question 2

Delivered MTM services in Medicare Part D diabetic patients tend to \_\_\_\_\_ patient costs (copays):

1/A Have little or no effect on

2/B Increase

3/C Decrease





# Questions

# Contact Information

---

Mitchell Barnett  
[mitchell.barnett@tu.edu](mailto:mitchell.barnett@tu.edu)

Brand Newland  
[bnewland@getoutcomes.com](mailto:bnewland@getoutcomes.com)



## Presentation Evaluation

# Supplemental Slides

---

# MTM Targeted Intervention Program (TIP®)

**TIP<sup>®</sup>** OUTCOMES  
Pharmaceutical Health Care  
**MTM SMARTER**

**PROTOCOL TIP DESCRIPTION CREATED DEADLINE [TIP200801-007] [DIABETES-ACEI] [MM/DD/YYYY] [MM/DD/YYYY]**

## TARGETED INTERVENTION PROGRAM

**PATIENT INFORMATION**  
ID NUMBER [2345678900]  
NAME [DOE, JOHN D.]  
GENDER/DOSB [M - MM/DD/YYYY]  
GROUP [OPHC]

<b>PRESCRIPTION INFORMATION</b>		DATE [2005/05/01]
RX NUMBER [1234567]	RX NUMBER [1234568]	
DRUG NAME [DIABETES MEDICATION]	DRUG NAME [HYPERTENSION MEDICATION]	
QTY [30]	QTY [30]	
PRESCRIBER [AB1234567]	PRESCRIBER [AB1234567]	

**ENCOUNTER OVERVIEW**  
PATIENTS WITH DIABETES AND CONCURRENT HYPERTENSION HAVE BEEN SHOWN TO BENEFIT FROM THE ADDITION OF AN ACE INHIBITOR TO THEIR MEDICATION REGIMEN. ACCORDING TO THIS PATIENT'S DRUG PROFILE, YOU MAY HAVE AN OPPORTUNITY TO HELP THIS PATIENT TO ACHIEVE OPTIMAL DRUG THERAPY OUTCOMES BY RECOMMENDING INITIATION OF THE FOLLOWING TO THE PRESCRIBER (WITH PATIENT CONSENT):

- > BENAZEPRIL 5MG DAILY
- > ENALAPRIL 2.5MG DAILY
- > LISINAPRIL 5MG DAILY

A PRESCRIBER CONSULTATION (IN LIEU OF A PATIENT OFFICE VISIT) TO ADDRESS THIS MATTER IS PAYABLE THROUGH THE OUTCOMES ENCOUNTER MEDICATION THERAPY MANAGEMENT (MTM) PROGRAM. APPROPRIATE DOCUMENTATION OF THE STEPS BELOW WILL RESULT IN PAYMENT TO YOUR PHARMACY ACCORDING TO THE SCHEDULE PROVIDED.

### MTM DOCUMENTATION & BILLING

STEP 1: INTERVENTION ASSESSMENT		
TARGETED INTERVENTION IS VALID	<input type="checkbox"/>	
TARGETED INTERVENTION IS INVALID	<input type="checkbox"/>	
NEEDS THERAPY (REASON)	CODE	
NEEDS THERAPY	120	\$0
STEP 3: MTM SERVICE (ACTION)	CODE	
PRESCRIBER CONSULTATION	205	\$0
STEP 4: OUTCOME OF SERVICE (RESULT)	CODE	
INITIATION OF BENAZEPRIL 5MG	330	<input type="checkbox"/>
INITIATION OF ENALAPRIL 2.5MG	330	<input type="checkbox"/>
INITIATION OF LISINAPRIL 5MG	330	<input type="checkbox"/>
PRESCRIBER REFUSAL	375	<input type="checkbox"/>
PATIENT REFUSAL	380	<input type="checkbox"/>
OTHER (PLEASE DESCRIBE IN STEP 6)	370	<input type="checkbox"/>
STEP 5: ESTIMATED COST AVOIDANCE LEVEL	LEVEL	
HOSPITAL ADMISSION	6	\$0
STEP 6: ENCOUNTER NOTES AND ECA RATIONALE		
PER PROTOCOL TIP200801-007 (DIABETES-ACEI)		
STEP 7: ADDITIONAL PHARMACIST NOTES (OPTIONAL)		

MTM FEE  
SEE BELOW  
RETURN TIP

**COMPLETE THIS STEP FIRST**

**THEN, COMPLETE THIS STEP AND FAX TO OUTCOMES AT 515.237.0002**

MTM FEE  
\$20.00  
\$20.00  
\$20.00  
\$2.00  
\$0.00  
\$\*

\*IF "OTHER", FEE TO BE DETERMINED BASED ON DOCUMENTATION IN STEP 6 BELOW.

### PROVIDER INFORMATION

PHARMACY: MEDICINE SHOPPE 1234  
500 MAIN STREET  
CLOVERVILLE, KY 00000  
NCPDP/NABP:  
PHONE: 808.555.1212  
FAX: 808.555.1213

PHARMACIST LAST NAME:

[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

PHARMACIST FIRST NAME:

[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

PHARMACIST ID:

[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

**Disclaimer:** The information provided is for support purposes only and does not replace the clinical decision making of a practicing pharmacist. All decisions relating to the provision, nature, and/or extent of services provided shall remain exclusively within the discretion of the practicing pharmacist. Outcomes Pharmaceutical Health Care is not liable for any negligent act or omission of a practicing pharmacist and does not warrant, either express or implied, any pharmacy service provided by a practicing pharmacist. The information provided herein is believed to be accurate; however, Outcomes Pharmaceutical Health Care does not assume responsibility for any inaccuracies or misinterpretations.

I have read and acknowledge the above disclaimer:

\_\_\_\_\_  
PHARMACIST SIGNATURE

\_\_\_\_\_  
DATE

- ▶ Prescription Claims Data
  - ▶ Retro-DUR analysis
  - ▶ Distributed to all dispensing pharmacies – not just MTM Network (fax or mail)
- ▶ Claim submission
  - ▶ Hard copy
    - ⊕ No training necessary
    - ⊕ Mail or fax
  - ▶ Electronic TIP Queue

# Targeted Intervention Programs (TIPs)

---

- Cost
  - Formulary/Preferred Drug List support
- Quality
  - Acumen, HEDIS/NCQA, PQA measures
  - Non-compliance
  - Cardiovascular
  - Asthma/COPD
  - Diabetes
  - Mental Health
  - Potentially Inappropriate Medications in the Elderly

# Reimbursement Rates for MTM Interventions

- Specific reimbursements vary between individual group and plan
- For Midwest Group presented:
  - Intervention with “Therapeutic Success”      \$20
  - Intervention with “Provider Refusal”              \$2
  - Intervention with “Patient Refusal”                \$0
  - For more comprehensive services, reimbursements are much greater, e.g., comprehensive medical review (CMR)

# Estimated Cost Avoidance (ECA)

---

- Pharmacist chooses “reasonable and foreseeable” ECA level, verified by outside 3rd party
- Linked to actual ECA dollar values, e.g.,
  - \$307 per avoided MD visit
  - \$605 per avoided ER visit
  - \$17,706 per avoided hospital admission
- Derived from national health care utilization cost averages using validated methodology
- Return on investment (\$) typically >10:1



# Top Ten Costly Drugs

- Lipitor (lipid lowering)
- Plavix (anti-platelet)
- Nexium (gastrointestinal-proton pump inhibitor)
- Seroquel (atypical antipsychotic)
- Risperdal (atypical antipsychotic)
- Prevacid (gastrointestinal-proton pump inhibitor)
- Norvasc (cardiovascular-ca channel blocker)
- Zyprexa (atypical antipsychotic)
- Aricept (Alzheimer's-acetylcholinesterase inhibitor)
- Advair (Respiratory-steroid/beta agonist MDI)

[https://www.cms.gov/PrescriptionDrugCovGenIn/Downloads/PartDSymposiumFactSheet\\_2008.pdf](https://www.cms.gov/PrescriptionDrugCovGenIn/Downloads/PartDSymposiumFactSheet_2008.pdf)

# Beers Criteria Medications

- List of potentially inappropriate medications (PIM) in older patients, the “Beers criteria”— originally developed by team of geriatricians to reduce falls in nursing home residents (1997)
- By 2002, the Beers criteria had been updated, expanded, and designed to apply to general population of patients 65 years and older
- Medications on the list include antidepressants (e.g. doxepin and amitriptyline), long-acting benzodiazepines (e.g. diazepam), and other anticholinergic (e.g., diphenhydramine) and central nervous system depressive agents (e.g., propoxyphene) which are thought to increase the risk of falls

Fick, D et al. *Arch Intern Med.* 2003;163:2716-2724