Integration of Clinical Pharmacists into the Medical Home: Measuring Clinical Impact

Anthony P. Morreale, Pharm.D., MBA, BCPS, Assistant Chief Consultant for Clinical Pharmacy Services and Healthcare Delivery Services Research of the Department of Veterans Affairs.
Agenda

- 12:03 – 12:08pm – Introductions
- 12:08 – 12:20pm – Overview of PCPCC’s Medication Management Guide
- 12:20 – 1:05pm – Integration of Clinical Pharmacists into the Medical Home: Measuring Clinical Impact
- 1:05 – 1:25pm – Audience Q&A
- 1:25 – 1:30pm – Closing Remarks
Today’s Participants

- **Introduction by:**
  **Terry McInnis**, MD, MPH, FACOEM, President and Founder of Blue Thorn Inc.

- **Guest Speaker:**
  **Anthony P. Morreale**, Pharm.D., MBA, BCPS, Assistant Chief Consultant for Clinical Pharmacy Services and Healthcare Delivery Services Research of the Department of Veterans Affairs.

- **Moderator:**
  **Edwin Webb**, PharmD, MPH, Associate Executive Director & Director of Government and Professional Affairs, American College of Clinical Pharmacy
The PCPCC Defines Comprehensive Medication Management (CMM)

- The PCPCC Guide Defines comprehensive medication management in the patient centered medical home
- AHRQ Innovation Center–Quality Toolkit
- 2nd Revision with Appendix A–“Guidelines for Practice and Guidelines for Documentation
Describe the VA version of the Medical Home Model called Patient Aligned Care Teams (PACT) and share data on improvements in care that have been demonstrated to date.

Discuss the integration of the Clinical Pharmacist in the PACT focusing on the top of the license collaborative practice in Chronic Disease & Medication Management.

Describe data systems that have been created to document the interventions and outcomes associated with clinical pharmacist care.

Discuss the outcomes being demonstrated by Clinical Pharmacists and the implications to cost benefit and cost effectiveness through validated modeling techniques.
Overview VA version of the Medical Home Model known as “Patient Aligned Care Teams” (PACT)
## VA HEDIS Performance (2012)

<table>
<thead>
<tr>
<th>Clinical Indicator</th>
<th>VA Average Percent (1)</th>
<th>HEDIS 2011 (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012 (6)</td>
<td>2011 (6)</td>
</tr>
<tr>
<td>Breast Cancer Screening</td>
<td>87</td>
<td>85</td>
</tr>
<tr>
<td>Cervical Cancer Screening</td>
<td>93</td>
<td>93</td>
</tr>
<tr>
<td>Cholesterol Management for Patients with Cardiovascular LDL-C Control (&lt;100 mg/dL)</td>
<td>70</td>
<td>71</td>
</tr>
<tr>
<td>Cholesterol Management for Patients with Cardiovascular Conditions: LDL-C Screening</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Colorectal Cancer Screening</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td><strong>Comprehensive Diabetes Care - Blood Pressure Control (&lt;140/90)</strong></td>
<td>80</td>
<td>81</td>
</tr>
<tr>
<td>Comprehensive Diabetes Care - Eye Exams</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Comprehensive Diabetes Care - HbA1c Testing</td>
<td>98</td>
<td>98</td>
</tr>
<tr>
<td><strong>Comprehensive Diabetes Care - LDL-C Controlled (LDL-C&lt;100 mg/dL)</strong></td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>Comprehensive Diabetes Care - LDL-C Screening</td>
<td>97</td>
<td>97</td>
</tr>
<tr>
<td>Comprehensive Diabetes Care - Medical Attention for Nephropathy</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td><strong>Comprehensive Diabetes Care - Poor HbA1c Control (8)</strong></td>
<td>19</td>
<td>17</td>
</tr>
<tr>
<td>Controlling High Blood Pressure - Total</td>
<td>77</td>
<td>78</td>
</tr>
<tr>
<td>Medical Assistance with Smoking Cessation - Advising Smokers To Quit 3</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>Medical Assistance with Smoking Cessation - Discussing Medications 3</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>Medical Assistance with Smoking Cessation - Discussing Strategies 3</td>
<td>96</td>
<td>97</td>
</tr>
<tr>
<td>Flu Shots for Adults (50-64) 3</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td>Flu Shots for Adults (65 and older) 3, 4, 5</td>
<td>76</td>
<td>79</td>
</tr>
<tr>
<td>Immunizations: Pneumococcal 3, 4, 5</td>
<td>93</td>
<td>94</td>
</tr>
</tbody>
</table>

**SOURCE:** Office of Analytics and Business Intelligence Updated 11/28/2012
Core PACT Principles

- Patient Centered and Team Based
- Team Members work at top of their license, training and competency
- Same Day Access
- Focus on Preventive Care
- Population management of High Risk Patients
- Evidence Based
- Lower Cost through reductions in ER visits and hospitalizations
Other Team Members
Clinical Pharmacy Specialist: ± 3 panels
Clinical Pharmacy anticoagulation: ± 5 panels

Social Work: ± 2 panels
Nutrition: ± 5 panels
Case Managers Trainees
Integrated Behavioral Health Psychologist ± 3 panels
Social Worker ± 5 panels
Care Manager ± 5 panels
Psychiatrist ± 10 panels

Other Team Members

Teamlet: assigned to 1 panel (±1200 patients)

- Provider: 1 FTE
- RN Care Mgr: 1 FTE
- Clinical Associate (LPN, MA, or Health Tech): 1 FTE
- Clerk: 1 FTE

For each parent facility
Health Promotion Disease Prevention Program Manager: 1 FTE
Health Behavior Coordinator: 1 FTE
My HealtheVet Coordinator: 1 FTE

The Patient’s Primary Care Team

Patient Caregiver
Changes Since PACT Implementation

- Patient provider encounters have increased 12 percent.
- Encounters with Veterans has increased 50 percent mostly due to telehealth, telephone and group encounters.
- 65 percent of Veterans requesting a same day primary care appointment with their personal provider are accommodated.
- 78 percent of Veterans are able to see their own primary care provider for an appointment on the date they desire.
- Veteran access to primary care during extended hours (non-business hours) has increased 75 percent since January 2013.

Source: VA Press Release April 30, 2014
Over 72 percent of all Veterans discharged from VA are contacted within two days.

Mental health services offered in VA primary care clinics increased 18 percent.

33 percent decrease in primary care patients urgent care visits.

12 percent decrease and acute hospital admissions.

Veterans strongly endorse VA health care, with 91 percent offering positive assessments of inpatient care and 92 percent for outpatient care.

Source: VA Press Release April 30, 2014
Integration of Clinical Pharmacists (CP)

- Focusing on working the CP at the top of the license
- Collaborative practice which focuses on Chronic Disease Management
- Aligns with 2010 PCPCC publication entitled “Integrating Comprehensive Medication Management to Optimize Patient Outcomes”
Under Federal law 38 USC 7402(b), the Department of Veterans Affairs (VA) is authorized to:

- establish professional practice elements such as licensure requirements, qualifications, and scopes of practice for the employment of VA pharmacists
- VHA Directive 2009–014: granted Pharmacist medication prescribing & monitoring privileges based on a locally-defined scope of practice
- Comprehensive medication management is performed autonomously but collaboratively by the CPS
Clinical Pharmacy Model Vision: Bridging the Gap Between Primary Care and Specialty Care

Patient Complexity, Health Status, Needs

Patient Aligned Care Team

Teamlet & Expanded Team

Coordination of Care

Clinical Pharmacy Specialist

Clinical Pharmacy Model Vision: Bridging the Gap Between Primary Care and Specialty Care

Specialty Care

Disease/Cohort Management

Management of Care
Role
PACT CPS

Access
- Improve PC access
- Improve Specialty access
- Med reconciliation
- Walk-in prescription renewal clinic

Care Management & Coordination
- Disease state management
- Clinical performance measure improvement
- Dual Care
- Anticoagulation Clinic
- High risk patient management

Practice Redesign
- Cost avoidance
- Increased safety
- Provider education
- Innovative avenues for management

Patient Centeredness: Mindset and Tools

Improvement: Systems Redesign

Resources: Technology, Staff, Space, Community
VHA has approximately 7,050 Pharmacists

Pharmacists with Scope of Practice exceeds 2,935 (42%)

Of These 2,935

<table>
<thead>
<tr>
<th>Category</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residency</td>
<td>64%</td>
</tr>
<tr>
<td>BPS Certification</td>
<td>38%</td>
</tr>
<tr>
<td>Other Certification</td>
<td>15%</td>
</tr>
<tr>
<td>Residency &amp;/or Certification</td>
<td>76%</td>
</tr>
</tbody>
</table>
Pharmacists with a Scope of Practice (n=2,935)
Number of Pharmacists With a Scope of Practice – Growth Over Time

Data Source: CPPO Scope of Practice SharePoint Database
Pharmacist SOP by Disease State

- Global/General (not dx specific)
- Anticoagulation
- Lipids
- Diabetes
- Hypertension
- Inpatient – Int. Med.
- Smoking Cessation
- CHF
- ESA/Anemia
- COPD
- Thyroid
- BPH
- Pain Management
- Inpatient – Specialty
- Mental Health/Psychiatry
- Geriatrics
- Infectious Disease
- Hepatitis C
- Osteoporosis
- Pharmacokinetics
- Renal/Nephrology
- Oncology

Values:
- Global/General: 1237
- Anticoagulation: 876
- Lipids: 478
- Diabetes: 406
- Hypertension: 405
- Inpatient – Int. Med.: 621
- Smoking Cessation: 288
- CHF: 329
- ESA/Anemia: 279
- COPD: 246
- Thyroid: 172
- BPH: 167
- Pain Management: 210
- Inpatient – Specialty: 122
- Mental Health/Psychiatry: 209
- Geriatrics: 195
- Infectious Disease: 157
- Hepatitis C: 100
- Osteoporosis: 58
- Pharmacokinetics: 21
- Renal/Nephrology: 68
- Oncology: 70
Percentage of Time Spent Working Under Scope of Practice

- <25% (<10 hrs/wk): 548
- 25-49% (10-19 hrs/wk): 417
- 50-74% (20-29 hrs/wk): 388
- 75-100% (30-40 hrs/wk): 1611
Define differences between a Clinical Pharmacist and Clinical Pharmacy Specialist

Developed field guidance on Scope of Practice (SOP)

Outline routine pharmacist activities that do and do not need a SOP

Revise VHA Directive 2008–043 Scope of Practice for clarity

Assured impact of SOP are adequately reflected in pharmacist qualification standards
Ongoing Professional Practice Evaluation (OPPE)

- Required for all pharmacist with a scope of practice
- Used to demonstrate ongoing competencies and outcomes
- Prospectively designed metrics which define performance developed locally and reviewed at least annually
- Important for identifying areas of strength and weakness
Standardize Training

Pharmacy Chronic Disease Management (Phase I 2010–2011)
- Pain Management
- Diabetes
- Hepatitis C
- Hyperlipidemia
- Hypertension
- Osteoporosis
- Tobacco Dependence

Specialty Care focused (Phase II 2012–2013)
- Cardiology – Heart Failure
- Mental Health
- Hematology/Oncology
- Respiratory
- Nephrology
- Women’s Health

All programs are recorded and can be taken by trainees and new employees to assure consistency in managing patients the “VA way”.
## Nationwide Workload Trends

<table>
<thead>
<tr>
<th>Parameter</th>
<th>FY11</th>
<th>FY12</th>
<th>FY13</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td># Pharmacists with SOP</td>
<td>2,132</td>
<td>2,616</td>
<td>2,870</td>
<td>35%</td>
</tr>
<tr>
<td>% Pharmacist FTE Under SOP</td>
<td>Data not available</td>
<td>32%</td>
<td>35%</td>
<td>9%</td>
</tr>
<tr>
<td>Encounters/FTE</td>
<td>403</td>
<td>615</td>
<td>629</td>
<td>56%</td>
</tr>
<tr>
<td>Total 160 Encounters</td>
<td>2,454,419</td>
<td>3,677,269</td>
<td>4,067,110</td>
<td>66%</td>
</tr>
</tbody>
</table>
Documenting Interventions and Outcomes Associated with Clinical Pharmacist Care
Issues with Outcomes Studies

- Single Site – utility for scalability is limited
- Small numbers of patients which may not allow for strong statistical analysis
- Descriptive in nature and lack control groups
- Multiple centers analysis suffer from methodological issues
- A better way is needed!
**Linking Cost Avoidance to CPS Interventions**

**Development of a Cost Benefit Model**

- Development of cost benefit model underway based on Lee et.al. which provided base for cost avoidance of interventions.
- Modeling and validation is still a work in progress in 2014.
- Aldridge et.al. showed that 7% of interventions made in ED had potential to cause harm.

<table>
<thead>
<tr>
<th>Type of Intervention</th>
<th>Avg Cost Avoidance per Intervention (Lee et. al)</th>
<th>Possible Cost Avoidance assoc with FY12 CPS Interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease State Medication Interventions</td>
<td>$363.73</td>
<td>$6,533,318</td>
</tr>
<tr>
<td>Adj. Dose or Frequency</td>
<td>$363.73</td>
<td>$616,522</td>
</tr>
<tr>
<td>Drug Interaction</td>
<td>$398.97</td>
<td>$83,384</td>
</tr>
<tr>
<td>Drug Not Indicated</td>
<td>$91.88</td>
<td>$30,923</td>
</tr>
<tr>
<td>Duplicate Therapy</td>
<td>$169.91</td>
<td>$22,937</td>
</tr>
<tr>
<td>New Tx for Existing Diagnosis</td>
<td>$1,861.46</td>
<td>$4,275,773</td>
</tr>
<tr>
<td>Manage ADE</td>
<td>$674.61</td>
<td>$1,204,853</td>
</tr>
<tr>
<td>Manage Allergy</td>
<td>$289.48</td>
<td>$43,132</td>
</tr>
<tr>
<td>Total CPS Cost Avoidance (based on Lee et.al.)</td>
<td></td>
<td>$12,810,846</td>
</tr>
</tbody>
</table>

Lee et.al.  AJHP 2002;59:2070-2077
Aldridge et al AJHP 2010
Pharmacists Achieve Results with Medications Documentation (PhARMD) Project

Measuring Interventions and Outcomes System Wide Using a Pharmacotherapy Intervention Tracking Tool
CPS Documentation of Pharmacotherapy Interventions

Anticoagulation Intervention
Compliance/Adherence Addressed
Contraindication to Medication
Drug Interaction Addressed
Drug Not Indicated
Duplication Of Therapy
Medication Interventions
Med Reconciliation Performed
Non-formulary Review/Conversion
Prevent /Manage Drug Allergy
Manage Adverse Drug Event
Non-pharmacologic Intervention
Therapeutic Drug Monitoring
Diabetes Intervention or Goal Met
Hypertension Intervention or Goal Met
Heart Failure Intervention or Goal Met
Lipid Intervention or Goal Met
Bone Health Intervention
Smoking Cessation Intervention or Goal Met
Hepatitis C Intervention or Goal Met

PBM designed a clinical reminder tool for roll-out by end of calendar year. Project aligns with VHA Transformational Initiatives

Tool provides documentation of clinical interventions related to medication management by Clinical Pharmacy Specialists (CPS) across VHA, as non-physician providers.

CPRS tools provide the ability to document Pharmacotherapy interventions which have demonstrated:

- Potential to reduce harm to patients
- Potential cost avoidance to healthcare system

CPS demonstrate the ability to document clinical interventions and therapeutic achievements for specific disease states
Primary Care Conditions Addressed:

- Hypertension

Goal for patient (required to choose one):

- Patient's goal is <130/80
- Patient's goal is <140/80
- Patient's goal is <140/90
- Patient's goal is:

- Medication intervention
  - Initiate new medication for previously untreated diagnosis
  - Adjust dose or frequency of a current medication
  - Discontinue, change to different medication, or add new medication to current therapy
    **If related to management of an ADE or allergy, please document as well under additional pharmacotherapy intervention, manage ADE or allergy**
- Nonpharmacologic intervention made
  **Examples include, but are not limited to:**
  - Disease state education,
  - Lifestyle counseling and education,
  - Providing educational materials,
  - Providing home monitoring devices,
  - Making referrals for additional care
- At goal as product of CPS med management care

The CPS documents interventions made and when goals achieved
## PhARMD Project Expansion Results

<table>
<thead>
<tr>
<th>Metric</th>
<th>FY12</th>
<th>FY13</th>
<th>FY14*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Pharmacist tool users</td>
<td>117</td>
<td>893</td>
<td>964</td>
</tr>
<tr>
<td>Total Disease State Interventions</td>
<td>15,410</td>
<td>180,019</td>
<td>320,200</td>
</tr>
<tr>
<td>Total Additional Pharmacotherapy Interventions</td>
<td>16,717</td>
<td>129,917</td>
<td>299,800</td>
</tr>
<tr>
<td>Avg Number of Interventions per visit</td>
<td>1.87</td>
<td>1.75</td>
<td>1.74</td>
</tr>
</tbody>
</table>

* As of March 1, 2014 6 months data extrapolated to 12 months
Modeling Cost Benefit of Outcomes and Interventions
Archimedes™ to Project Outcomes Associated with Disease Management

Archimedes is a well substantiated and validated modeling tool which can be used to project cardiovascular and diabetes related outcomes based on changes in surrogate markers.

First created and described by Kaiser Permanente but spun off as a separate company.

Predicted outcomes show strong correlation to real outcomes in numerous studies. Costs are not VA specific but a starting point for future work.

Now being applied to our PhARMD data to project both outcomes and cost benefit of various interventions in various cohorts, standardized to our demographics.
Analysis Description

Slides based on PhARMD data run April 2014

Represent Outcomes as documented by the PhARMD tool.

Analysis of Outcomes of patients referred for a specific disorder (e.g.: DM or Lipids) to a clinical pharmacist.

Outcomes are measured 6 months after baseline referral.
Changes in Biomarkers over 6 months

Diabetes Referral Cohort

<table>
<thead>
<tr>
<th>Biomarker</th>
<th>baseline</th>
<th>6 months</th>
<th>Absolute change</th>
</tr>
</thead>
<tbody>
<tr>
<td>HbA1c</td>
<td>8.92</td>
<td>7.82</td>
<td>-1.1</td>
</tr>
<tr>
<td>LDL</td>
<td>105</td>
<td>93.71</td>
<td>-11.29</td>
</tr>
</tbody>
</table>

Lipid Cohort

<table>
<thead>
<tr>
<th>Biomarker</th>
<th>baseline</th>
<th>6 months</th>
<th>Absolute change</th>
</tr>
</thead>
<tbody>
<tr>
<td>LDL</td>
<td>118</td>
<td>95.5</td>
<td>-22.5</td>
</tr>
</tbody>
</table>
# Diabetes Patient Demographics

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>64.4</td>
</tr>
<tr>
<td>LDL</td>
<td>105.4</td>
</tr>
<tr>
<td>BMI</td>
<td>28.2</td>
</tr>
<tr>
<td>DBP</td>
<td>74</td>
</tr>
<tr>
<td>SBP</td>
<td>131</td>
</tr>
<tr>
<td>Weight kg</td>
<td>105</td>
</tr>
<tr>
<td>Male</td>
<td>95.9%</td>
</tr>
<tr>
<td>GFR</td>
<td>73.9</td>
</tr>
</tbody>
</table>
## DM NTT Table with Positive Benefit

<table>
<thead>
<tr>
<th>Trial Arm</th>
<th>Size</th>
<th>MI (NNT) 95% CI</th>
<th>CHD death (NNT) 95% CI</th>
<th>CHF (NNT) 95% CI</th>
<th>Acute Heart Failure (NNT) 95% CI</th>
<th>Foot amputation (NNT) 95% CI</th>
<th>Foot ulcer (NNT) 95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>10,000</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Trial Arm</td>
<td>10,000</td>
<td>32 (29;36)</td>
<td>214 (146;400)</td>
<td>31 (28;35)</td>
<td>28 (25;31)</td>
<td>35 (31;39)</td>
<td>18 (16;19)</td>
</tr>
</tbody>
</table>
DM Group – MI Absolute Risk Reduction 5% at 10 year
DM Group – MI Relative Risk Reduction 30% over 10 years but starts early

MI (Kaplan-Meier)
Relative difference from control arm

Time (years)

TrialArm_1
DM Group – Foot Amputation Absolute Risk Reduction 5% over 10 years
DM Group – Foot Amputation 40%
Relative Risk Reduction over 2–20 years
DM Group – Foot Ulceration 40%
Relative Risk Reduction over 2–10 years
DM Group – Heart Failure 7% Absolute Risk Reduction at 10 years

CHF (Kaplan-Meier)
Absolute values

incidence

Time (years)

0 2 4 6 8 10

Control TrialArm_1
### Using NNT’s to Calculate Cost Benefit of PhARMD Outcomes

<table>
<thead>
<tr>
<th>Disease Cohort</th>
<th>Clinical Outcome</th>
<th>NNT (95% CI)</th>
<th>Visits</th>
<th>$Cost/ Visit (Avg cost)</th>
<th>Estimated 2 year Cost/Event*</th>
<th>Benefit/Cost **</th>
</tr>
</thead>
<tbody>
<tr>
<td>DM</td>
<td>MI</td>
<td>32 (29:36)</td>
<td>2–4</td>
<td>$75–150 ($112)</td>
<td>$30,000</td>
<td>5.5:1</td>
</tr>
<tr>
<td>CHF</td>
<td></td>
<td>31 (28:35)</td>
<td>2–4</td>
<td>$75–$150 ($112)</td>
<td>$40,000</td>
<td>7.6:1</td>
</tr>
<tr>
<td>Foot Amp</td>
<td></td>
<td>35 (31:39)</td>
<td>2–4</td>
<td>$75–$150 ($112)</td>
<td>$81,000</td>
<td>13.8:1</td>
</tr>
<tr>
<td>Foot Ulcer</td>
<td></td>
<td>18 (16:19)</td>
<td>2–4</td>
<td>$75–$150 ($112)</td>
<td>$13,000</td>
<td>4.5:1</td>
</tr>
<tr>
<td>CHD Death</td>
<td></td>
<td>63</td>
<td>2–4</td>
<td>$75–$150 ($112)</td>
<td>Priceless</td>
<td></td>
</tr>
</tbody>
</table>

Calculations for benefit: cost ratio used the max visits, the worst 95% confidence intervals

Ref: Population Health Management Volume 14, Number X 2011
Ref: J Vasc Surg 2010;52:17S–22S
Ref: Diabetes Care 22:382–387, 1999
Important to remember that the described NNT’s were achieved during the same 2–4 visits to the Clinical Pharmacist. Therefore Cost benefits of each individual sequela needs to be combined to give true ROI.

Even if one were to double or triple the time and cost of the Pharmacist for these interventions return on investment would exceed $9 for every $1 invested.

Magnifies the importance of the Pharmacist having a more global scope of practice so they can manage multiple diseases simultaneously!

<table>
<thead>
<tr>
<th>Max NNT</th>
<th>Max visits (4)</th>
<th>Cost MI</th>
<th>Cost CHF</th>
<th>Cost Foot Amp</th>
<th>Cost Ulcer</th>
<th>Total $ Benefit</th>
<th>Total Benefit/cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>$150</td>
<td>$30K</td>
<td>$40K</td>
<td>$81K</td>
<td>$13K</td>
<td>$164K</td>
<td>28:1</td>
</tr>
</tbody>
</table>
Sensitivity Analysis Cost Benefit to Co morbidity Overlap

% Dz overlap

Benefit:Cost Ratio

CB ratio
Future Endeavors

Additional analysis of outcomes achieved examining patient variability including demographics and co-morbidities.

Additional analysis of outcome variability based on medications used, training and background of pharmacists and other demographic variables to identify strong practices.

Application of patient complexity and matched control groups of usual care to the economic and outcomes models.
The VA’s “PACT” Model has made significant progress since its roll out in mid-2010 with impressive gains in key areas.

In alignment with PCPCC documents there has been widespread application of Clinical Pharmacist in this model to perform Chronic Disease & Medication Management.

Creation and application of data collection and analytical tools are leading to a broad recognition of the benefits of Clinical Pharmacist to health outcomes achieved.

The consistency of outcomes achieved and impressive cost: benefits ratio represents a significant argument for more universal and widespread application of clinical pharmacist with a broad, global scope of practice in the health care system.
Anthony P. Morreale, Pharm.D., MBA, BCPS
Assistant Chief Consultant for Clinical Pharmacy Services
and Healthcare Delivery Services Research Pharmacy Benefits Management Services (119)
Department of Veterans Affairs
anthony.morreale@va.gov