

Health Care Quality Measures
*An Environmental Scan of Quality
Measures Related to the Pharmacy Quality
Alliance Identified Starter Set of Measures*

Created by: Brad Tice, PharmD, PMP

July 31, 2006

Index

Background.....	3
Methods.....	4
Results.....	8
General Overview.....	11
1. Diabetes.....	11
1.1.1 Diabetes: Adherence and Persistence – Medication Possession Ratio.....	11
1.2.1 Adequacy of Therapy: Presence of ACE/ARB therapy.....	14
1.2.2 Adequacy of Therapy: Presence of a statin.....	14
1.2.3 Adequacy of Therapy: Influenza vaccine.....	17
2. Hyperlipidemia.....	20
2.1 Adherence and Persistence: medication possession ratio.....	20
3. Respiratory Disorders.....	22
3.1 Adherence & Persistence – Medication Possession Ratio.....	22
3.2 Adequacy of Therapy - Absence of long term controller (inhaled steroid, leukotriene antagonist, etc.) in patients with frequent refills of albuterol inhaler.....	24
4. Hypertension.....	25
4.1 Adherence & Persistence – Medication Possession Ratio.....	25
5. Heart Failure.....	26
5.1 Adherence & Persistence – Medication Possession Ratio	26
5.2. Heart Failure: Adequacy of Therapy: Presence of Beta-Blocker.....	32
5.3 Heart Failure: Adequacy of Therapy: Presence of ACE/ARB.....	36
6.Patient Safety.....	39
6.1 Patient Safety – IOM “Safe” primary classification.....	39
6.2 Patient Safety – IOM “Safe” primary classification specific to elderly.....	48
6.3 Patient Safety – Patient Education/Care Plans.....	51
7. Generic Efficiency Index and Formulary Management.....	57
8. Medium Term Measures.....	57
8.1 Prevention and Wellness Programs – Smoking Cessation.....	57
8.2 Prevention and Wellness Programs – Vaccinations.....	60

Index (cont'd)

9. Gap Analysis.....	64
9.1 Gap Analysis – Identified Areas Lacking Developed Measures for Pharmacists/Pharmacies.....	65
9.2. Gap Analysis – Areas Identified with Existing Measures But Not Included in Initial Starter Set.....	66
Additional Information.....	67
Appendix A (Evidence of the Value of Pharmacists – from American Pharmacists Association).....	68
Appendix B(Literature Search on Pharmacy, Quality, and Measures).....	75
Appendix C (Literature Search on Adherence, Persistence, and Medications).....	81
Appendix D (IOM Report: Performance Measurement: Accelerating Quality – Measure Criteria).....	85
Appendix E (IOM Report: Performance Measurement: Accelerating Quality – Recommended Starter Set of Measures).....	87
Appendix F (AMCP/NCQA White Paper, Safe and Effective? Book Chapter Tables).....	88

Background:

In announcing the establishment of the Pharmacy Quality Alliance (www.pqaalliance.com), Mark McClellan, M.D, Ph.D., Administrator of CMS stated the intent was the “first step toward a pharmacy model that rewards real value delivered rather than just volume of prescriptions dispensed.” With the work of the Pharmacy Quality Alliance beginning in April of 2006, the pharmacy industry has been charged with determining how to measure itself on value and quality. The PQA developed an initial set of starter measures. To aid in determining how to implement the measures, the PQA determined that the next step necessary was to perform an environmental scan to determine how well these measures lined up with existing measures across health care and. To accomplish the environmental scan, the following charge was given:

Charge: To conduct an environmental scan within healthcare to identify, review and delineate where metrics exist that correlate to and correspond with the PQA’s template for a starter set of metrics.

Timeline: The environmental scan was to be performed beginning June 19, 2006 with a report due to the PQA Workgroup Chairs July 14 and subsequent report to the full PQA membership July 20, 2006 with a final draft of the report to be completed by July 31, 2006.

The PQA initial starter set of metrics include:

Table 1.

Short-Term Measures		
Patient Care/MTM Services		
Diabetes	Adherence & Persistence	Medication Possession Ratio
	Adequacy of Therapy	Presence of ACE/ARB Therapy
	Adequacy of Therapy	Presence of Statin
	Adequacy of Therapy	Influenza Vaccine
Hyperlipidemia	Adherence & Persistence	Medication Possession Ratio
Respiratory Disorders	Adherence & Persistence	Medication Possession Ratio
	Adequacy of Therapy	Absence of long term controller (inhaled steroid, leukotriene antagonist, etc.) in patients with frequent refills of albuterol inhaler.
Hypertension	Adherence & Persistence	Medication Possession Ratio
Heart Failure	Adherence & Persistence	Medication Possession Ratio
	Adequacy of Therapy	Presence of beta blocker
	Adequacy of Therapy	Presence of ACE Inhibitor
Patient Safety		
Goal: Reduce the use of drugs that	Modified Beers’ list	

have been shown to be contraindicated in the elderly or more likely to result in adverse events or drug interactions.		
Patient Education		
Generic Efficiency Index and Formulary Management		
Goals: Assuring quality of care through cost-effective drug therapy		Number of prescriptions dispensed generically.
		Therapeutic generic equivalents.
Medium-Term Measures		
Prevention and Wellness Programs	Smoking cessation	
	Vaccinations	

Methods:

To establish a method to review and correlate the PQA starter measures with existing measures and based on the Steering Committee’s input, the Institute of Medicine (IOM) “aims for improvement” from *Crossing the Quality Chasm* were identified to be used. They include health care being safe, effective, patient-centered, timely, efficient, and equitable.

Additionally, internet and literature searches were performed to identify sources for information and metrics on quality measures in health care. For the internet search, a google search was performed using the terms “quality” and “health care.” Websites were then reviewed for content specific to quality measurement. For the main literature search, the EBSCO Host Medline database was used. Keywords of quality, pharmacy, and measures were used. A second, separate literature search was performed using the keywords of medication, possession, and ratio to assist in the measures identified specific to that category. Materials were also submitted by PQA members for inclusion.

Findings:

Table 2: Web Search

Organization	Web Address	
Institute of Medicine	www.iom.edu	
National Quality Forum	www.qualityforum.org	
Agency for Healthcare Research and Quality	www.ahrq.gov	
National Quality Measures Clearinghouse	http://www.qualitymeasures.ahrq.gov	
ACOVE (Assessing Care of Vulnerable Elders)	http://www.acove.com/MainSite/HomePage.aspx?TabSelected=1	
Institute for Safe Medication Practices	www.ismp.org	
Hospital Quality Alliance	http://www.aha.org/aha/key_issues/qualityalliance/index.html	
Ambulatory Care Quality Alliance	www.ambulatoryqualityalliance.org	
Joint Commission on Accreditation of Healthcare Organizations	www.jointcommission.org	
National Committee for Quality Assurance	www.ncqa.org	
URAC – Utilization Review Accreditation Committee	www.urac.org	
American Society for Quality	www.asq.org	
Baldrige National Quality Program	http://www.quality.nist.gov	

A first, critical step in determining how to review and correlate the measures is to determine the criteria to evaluate the identified measures. Three key resources were identified to establish this foundation:

1. Porter Michael E., Teisberg Elizabeth O., *Redefining Health Care: Creating Value-Based Competition on Results*, Harvard Business School Press, Boston, Massachusetts, 2006.
2. Committee on Redesigning Health Insurance Performance Measures, Payment, and Performance Improvement Programs, Board on Health Care Services, *Performance Measurement: Accelerating Improvement*, Institute of Medicine of the National Academies, National Academies Press, 2006.
3. Kaplan Robert S., Norton David P., *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, Massachusetts, 1996.

1. Defining “Value” in Health Care¹

In May of 2006 Michael Porter, Bishop William Lawrence University Professor and leading authority on competition, company strategy, and international competitiveness based at Harvard Business School and Elizabeth Olmsted Teisberg, Associate Professor and expert on strategy and innovation at the University of Virginia’s Darden Graduate School of Business released their book “Redefining Health Care” in follow-up to their June 2004 report “Redefining Competition in Health Care” which describes the current health care competitive landscape as being “zero-sum” based, where competition results in:

- Competition to shift costs
- Competition to increase bargaining power
- Competition to capture patients and restrict choice
- Competition to reduce costs by restricting services

Porter and Teisberg describe that competition in health care needs to be transformed to being “positive-sum” based, where competition is value-based and driven by the quality of care delivered and outcomes achieved.

Principles of value-based competition include:

- The focus should be on value for patients, not just lowering costs.
- Competition must be based on results.
- Competition should center on medical conditions over the full cycle of care.
- High-quality care should be less costly.
- Value must be driven by provider experience, scale, and learning at the medical condition level.
- Competition should be regional and national, not just local.
- Results information to support value-based competition must be widely available.
- Innovations that increase value must be strongly rewarded.

2. Accelerating Improvement

The IOM report, *Performance Measurement: Accelerating Improvement*², provides an extensive report intended to “introduce a framework and implementation strategy for translating public and professional concerns about performance and accountability into measures of health care quality.” The committee performing the work consisted of a broad range of national experts. Its work captures much of the essence of the initial work of the members of the Pharmacy Quality Alliance and can serve to advance the work of the PQA. The framework used by the committee includes:

¹ Porter Michael E., Teisberg Elizabeth O., *Redefining Health Care: Creating Value-Based Competition on Results*, Harvard Business School Press, Boston, Massachusetts, 2006.

² Committee on Redesigning Health Insurance Performance Measures, Payment, and Performance Improvement Programs, Board on Health Care Services, *Performance Measurement: Accelerating Improvement*, Institute of Medicine of the National Academies, National Academies Press, 2006.

Table 3. *Performance Measurement: Accelerating Improvement*³, Analysis Framework

Analytic Frameworks	Framework Components
Donabedian	Structure – Process – Outcomes
IOM six aims	Safe, Effective, Patient-Centered, Timely, Efficient, and Equitable
FACCT domains of consumer needs	Staying healthy, Getting Better, Living with Illness or disability, and Coping with the End of Life
IOM priority areas	Infrastructure, Processes of care, Health care conditions
CMS priority chronic conditions for adults 65 and over	Ischemic heart disease, cancer, chronic obstructive pulmonary disease/asthma, stroke – including hypertension, arthritis and nontraumatic joint disorders, diabetes mellitus, dementia – including Alzheimer’s disease, pneumonia, peptic ulcer/dyspepsia, and depression and other mood disorders

3. Performance Measurement⁴

The main criteria identified from this work that is pertinent to the environmental scan is the concept of lead versus lag indicators:

Lead indicators – measures an aspect of a process that leads to the desired performance achievement (i.e. performance drivers)

Lag indicators – measure performance that has already occurred (i.e. outcomes measures)

Based upon these works, a Microsoft Access database was developed to categorize measures according to the following criteria:

Table 4. Database Categories

Category	Description/Fields
Measure	Description
Creator	Source for measure
Pharmacy Relevance	Drug, Follow-up, Indirect, Monitoring, None Identified, Customer Service, Patient Counseling
Donabedian	Structure, Process, Outcome
Type	Lead/Lag
FACCT	Staying Healthy, Getting Better, Living with Illness or Disability,

³ Committee on Redesigning Health Insurance Performance Measures, Payment, and Performance Improvement Programs, Board on Health Care Services, *Performance Measurement: Accelerating Improvement*, Institute of Medicine of the National Academies, National Academies Press, 2006.

⁴Kaplan Robert S., Norton David P., *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston, Massachusetts, 1996.

Domains	Coping with the End of Life
IOM Priority Areas	Infrastructure, Processes of Care, Health Care Conditions
Pharmacy Setting	Ambulatory, Hospital, Long-Term Care, Home Health Care, Amb/Hosp, Amb/Long-Term Care, Hospital/Long-Term Care, and All
General Disease Category	All, Arthritis and nontraumatic joint disorders, Asthma, Cancer, COPD, Coronary Artery Disease, Diabetes, Heart Failure, HIV, Hypertension, Infectious Disease, Ischemic Heart Disease, Kidney Disease, Mental Illness, Not Applicable, Obesity, Other, Pain Management, Peptic Ulcer/Dyspepsia, Pregnancy, Preventive Care, Smoking Cessation, Stroke, Surgery
Specific Category	Free text
IOM Six Aims	Primary
IOM Six Aims	Secondary
IOM Six Aims	Tertiary

measures were entered into a Microsoft Access database and categorized based on the analytic framework in sections 2 and 3 above. Significant overlap and duplication exists within these measures. This was left intentionally to present a full picture of what measures are being used and what groups are endorsing the measures.

Results:

1,676 measures were identified from the following sources:

Table 5. Sources of Identified Measures

Source	Number of Measures
Agency for Healthcare Research and Quality	115
American Academy of Orthopaedic Surgeons	7
American College of Cardiology	23
American Heart Association	23
American Medical Association on behalf of the American Academy of Orthopaedic Surgeons and the Physician Consortium for Performance Improvement	7
American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement	23
American Medical Association on behalf of the Physician Consortium for Performance Improvement	23
American Medical Directors Association	64
CAHPS (Consumer Assessment of Healthcare Providers and Systems) Consortium	39
Canadian Cardiovascular Outcomes Research Team	19
Canadian Cardiovascular Society	19

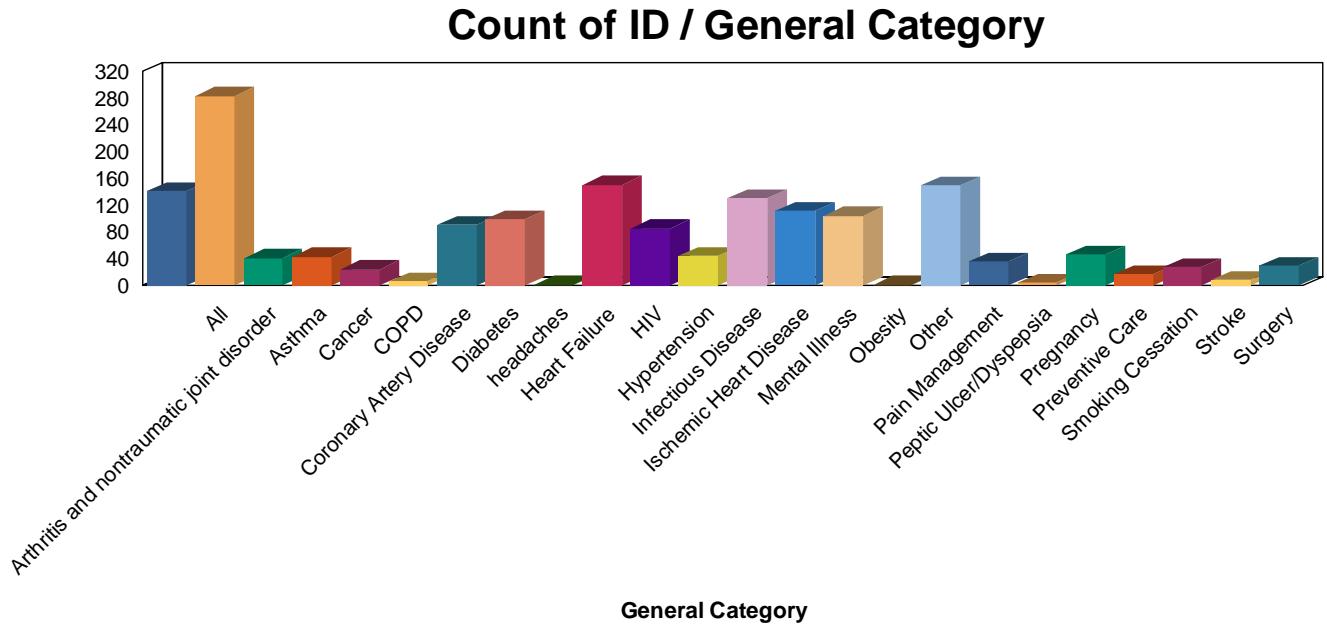
Center for Health Services Research, University of Colorado, under contract to Centers for Medicare and Medicaid Services	41
Centers for Medicare & Medicaid Services	130
Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations	30
Child and Adolescent Health Measurement Initiative	7
Child Health Corporation of America	3
Chinman, Matthew, Ph.D. (MIRECC); Young, Alexander S., M.D., M.S.H.S. (MIRECC); Sandy Forquer (Comprehensive Neuroscience Inc.); Edward Knight (ValueOptions); Anita Miller (ValueOptions); Melissa Rowe (RAND)	15
Chinman, Matthew, Ph.D.; Young, Alexander S., M.D., M.S.H.S.; Veterans Administration Desert Pacific Mental Illness Research, Education and Clinical Center (MIRECC)	15
Family Violence Prevention Fund	8
Focus On Therapeutic Outcomes, Inc	4
Harvard Medical School	17
Health Resources and Services Administration	13
HealthPartners	2
HRSA Health Disparities Collaboratives: Depression Collaborative	13
Inouye, Sharon K. M.D., M.P.H.	1
Institute for Clinical Systems Improvement	103
Joint Commission on Accreditation of Healthcare Organizations	39
Kolcaba, Katharine Ph.D.	1
Manitoba Centre for Health Policy	13
National Committee for Quality Assurance	38
National Diabetes Quality Improvement Alliance	20
New York State Department of Health AIDS Institute	85
Physician Consortium for Performance Improvement	53
Press Ganey Associates, Inc.	63
Renal Physicians Association	35
State of Wisconsin, Department of Health and Family Services	44
Therapeutic Associates, Inc.	1
Veterans Health Administration	53
Wisconsin Collaborative for Healthcare Quality	2
Young, Alexander S., M.D., M.S.H.S.; Veterans Administration Desert Pacific Mental Illness Research, Education and Clinical Center (MIRECC); and University of California Los Angeles	3
Hospital Quality Alliance (HQA)	21
Ambulatory Care Quality Alliance (AQA)	27

National Healthcare Quality Report (NHQR)	45
National Quality Forum Ambulatory Care Consensus Standards	33
RAND	111
ACOVE Quality Indicators	81
SCRIPT	38
AMCP/NCQA (WHITE PAPER) (not validated)	53
Other	53

General Overview

The 1,676 identified measures were classified into 24 categories as seen in Figure 1.

Figure 1.



I. Measures Identified Specific to the Pharmacy Quality Alliance Starter Set of Measures

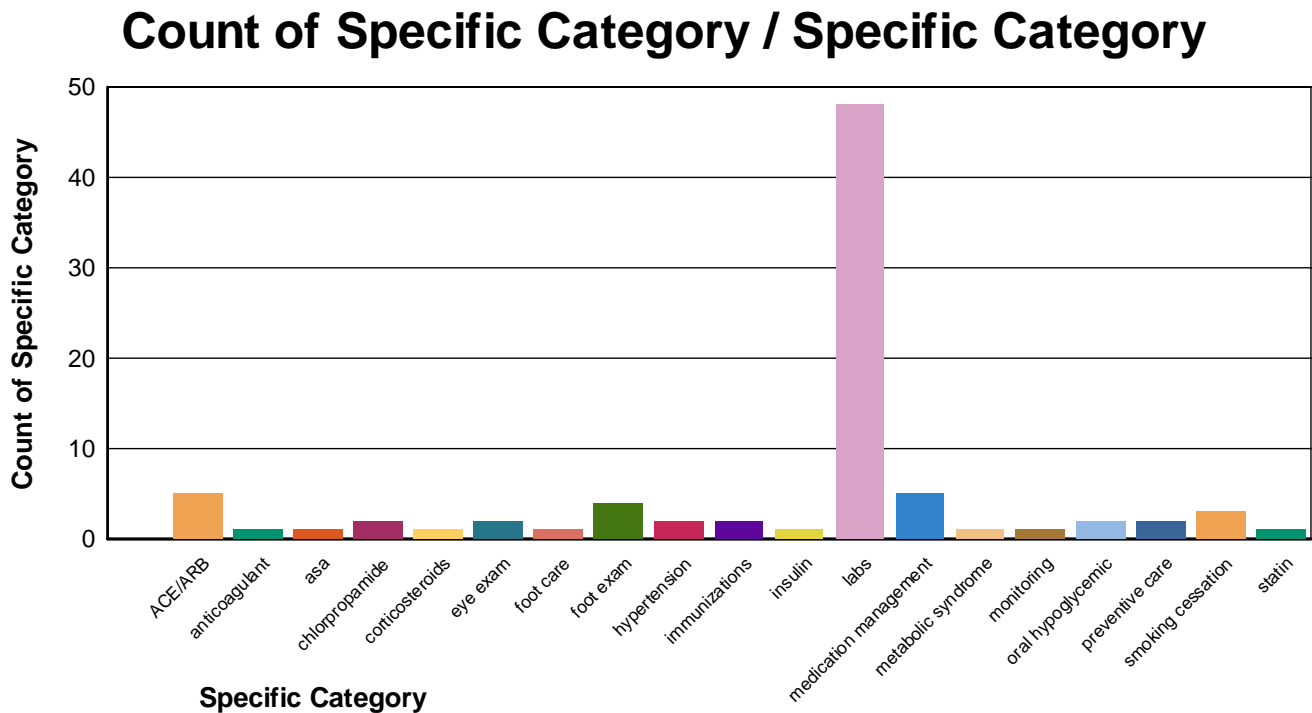
MTM Services

1. Diabetes

1.1 Adherence and Persistence

Ninety-seven measures were identified within the “general” classification of diabetes from 17 distinct sources. As seen in Figure 1, these measures were then subcategorized into 19 “specific” categories.

Figure 2. Diabetes Measures



1.1.1 Diabetes: Adherence and Persistence – Medication Possession Ratio

No validated measures were identified specific to the MPR (Medication Possession Ratio). It may be possible that the MPR exists within the definition of how to calculate some measures and would not appear through the descriptions of the measures. Measures specific to adherence and persistence are much more common using the terms adherence, persistence, prescribed, or received. Current measures most commonly do not go beyond measuring if a medication has been “prescribed” to the patient or “received” by the patient. Some measures exist to determine “what percent of patients are still taking the prescribed medication “X” number of days (e.g. 90, 180) after being initially prescribed. While no “validated” measures were found, there is a fair to significant amount of research in this area. Appendix C was included to identify research done in the area and include it for reference. In addition, the methods for measuring adherence and persistence were included to providing an additional starting point for measure creation.

Querying the entire list of measures using the terms using the terms adherence, persistence, prescribed, or received results in identification of 335 measures. Specific to diabetes, 11 measures are identified:

<u>Specific Category:</u>	<u>Creator</u>	<u>Pharmacy Relevance</u>	<u>Care Setting</u>	<u>IOM Aim primary</u>	<u>Donabedian Lead/Lag</u>
1.1.1-1 Percentage of patients who received a retinal or dilated eye exam by an eye care professional (optometrist or ophthalmologist) during the reporting year or during the prior year if patient is at low risk for retinopathy.	Ambulatory Care Quality Alliance (AQA)	Follow-up	Ambulatory		Process Lead
1.1.1-2 Adult diabetes: percentage of patients who received any test for microalbuminuria.	National Diabetes Quality Improvement Alliance(20)	Follow-up	All		Process Lead
1.1.1-3 Adult diabetes: percentage of patients who received a dilated eye examination or evaluation of retinal photographs if patient is at low risk for retinopathy.	National Diabetes Quality Improvement Alliance(20)	Follow-up	All		Process Lead
ACE/ARB					
1.1.1-4 Percentage of patients who also have diabetes and/or LVSD who were prescribed ACE inhibitor therapy	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care	Drug	All		Process Lead
1.1.1-5 CAD: Angiotensin Converting Enzyme Inhibitor (ACEI)/Angiotensin Receptor Blocker (ARB) Therapy: Percentage of patients with coronary artery disease who also have diabetes and/or LVSD who were prescribed ACEI or ARB therapy ¹	AHA	Drug	All		Process Lead
asa					
1.1.1-6 Adult diabetes: percentage of patients who were prescribed aspirin	National Diabetes Quality Improvement				

therapy (dose greater than or equal to 75 mg).

Alliance(20)
Drug
All

Process
Lead

chlorpropamide

1.1.1-7 IF a vulnerable elder is prescribed an oral hypoglycemia drug, THEN chlorpropamide should not be used.

ACOVE Quality Indicators
Drug
All

Process
Lead

immunizations

1.1.1-8 Adult diabetes: percentage of patients who received an influenza immunization during the recommended calendar period.

National Diabetes Quality Improvement
Alliance(20)
Drug
All

Process
Lead

1.1.1-9 Adult diabetes: percentage of eligible patients who received an immunization or refused immunization during the calendar period.

National Diabetes Quality Improvement
Alliance(20)
Drug
All

Process
Lead

labs

1.1.1-10 Adult diabetes: percentage of patients with no urinalysis or urinalysis with negative or trace urine protein, who received a test for microalbumin.

National Diabetes Quality Improvement
Alliance(20)
Monitoring
All

Process
Lead

oral hypoglycemic

1.1.1-11 Type 2 diabetics who have failed dietary therapy should receive oral hypoglycemic therapy.

RAND
Drug
All

Process
Lead

1.2.1 Adequacy of Therapy: Presence of ACE/ARB therapy:

Four measures were identified specific to Diabetes and ACE/ARB therapy:

<u>Specific Category:</u>	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
1.2.1-1 Diabetics with proteinuria should be offered an ACE inhibitor within 3 months of the notation of proteinuria unless contraindicated.	RAND Drug All Effective	Process Lead
1.2.1-2 IF a diabetic vulnerable elder has proteinuria, THEN he or she should be offered therapy with an ACE inhibitor.	ACOVE Quality Indicators Drug All Effective	Process Lead

1.2.1-3 Percentage of patients who also have diabetes and/or LVSD who were prescribed ACE inhibitor therapy

NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care
 Drug
 All
 Effective
 Process
 Lead

1.2.1-4 CAD: Angiotensin Converting Enzyme Inhibitor (ACEI)/Angiotensin Receptor Blocker (ARB) Therapy: Percentage of patients with coronary artery disease who also have diabetes and/or LVSD who were prescribed ACEI or ARB therapy¹

AHA
 Drug
 All
 Effective
 Process
 Lead

1.2.2 Adequacy of Therapy: Presence of a statin:

One measure was identified specific to Diabetes and presence of a statin:

Specific Category:

Diabetes

1.2.2-1 IF a diabetic vulnerable elder has a fasting total cholesterol level of 240 g/dL or greater, THEN he or she should be offered an intervention to lower cholesterol.

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary
 Donabedian
 Lead/Lag

ACOVE Quality Indicators
 Drug
 All
 Effective
 Process
 Lead

When including all measures related to statins, 16 additional measures have been identified.

Specific Category:

Coronary Artery Disease

1.2.2-2 IF a vulnerable elder has established coronary heart disease and an LDL cholesterol level greater than 130 mg/dL and a trial of step II diet therapy was not offered or was ineffective, THEN he or she should be offered cholesterol-lowering medication.

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary
 Donabedian
 Lead/Lag

ACOVE Quality Indicators
 Drug
 All
 Effective
 Process
 Lead

1.2.2-3 Chronic stable coronary artery disease (CAD): percentage of patients who were prescribed lipid lowering therapy.

Physician Consortium for Performance Improvement(53)
 Drug
 All
 Effective
 Process
 Lead

1.2.2-4 Percentage of patients with CAD who were prescribed a lipid-lowering therapy (based on current ACC/AHA guidelines).

Ambulatory Care Quality Alliance (AQA)
 Drug
 Ambulatory
 Effective
 Process
 Lead

1.2.2-5 CAD: Drug Therapy for Lowering LDL Cholesterol: Percentage of patients with CAD who were prescribed a lipid-lowering therapy (based on current ACC/AHA guidelines) 1	NCQA# Drug All Effective	Process Lead
1.2.2-6 Percentage of patients who were prescribed a lipid-lowering therapy	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Process Lead
1.2.2-7 Percentage of patients whose most recent LDL-C is <130 mg/dl or receiving a statin or other lipid-lowering therapy.	National Diabetes Quality Improvement Alliance Performance Measurement Set for Adult Diabetes Drug All Effective	Process Lead
1.2.2-8 Percentage of patients whose most recent LDL-C is <100 mg/dl statin or other lipid-lowering therapy.	National Diabetes Quality Improvement or receiving a Alliance Performance Measurement Set for Adult Diabetes Drug All Effective	Process Lead
1.2.2-9 Patients without preexisting coronary disease who are started on pharmacological treatment for hyperlipidemia should have had at least 2 measurements of their cholesterol (total or LDL) documented in the year before the start of pharmacological treatment.	RAND Drug All Efficient	Process Lead
1.2.2-10 Patients under age 75 with preexisting coronary disease who have an untreated LDL cholesterol level >130 mg/dl should begin diet or drug therapy within 3 months of the high LDL measurement.	RAND Drug All Effective	Process Lead
1.2.2-11 Patients under age 75 with preexisting coronary disease who have an LDL level >130 mg/dl after 6 months of dietary cholesterol-lowering treatment should receive pharmacological therapy for hyperlipidemia within 2 months of measurement.	RAND Drug All Effective	Process Lead
1.2.2-12 Patients in whom pharmacological therapy for hyperlipidemia has been initiated should have their total cholesterol, HDL, and LDL rechecked within 4 months.	RAND Monitoring Amb/Long Term Care Effective	Process Lead
1.2.2-13 Patients receiving pharmacological therapy for hyperlipidemia who have had a dosage or medication change should have total cholesterol, HDL, and LDL rechecked within 4 months of the change.	RAND Monitoring Amb/Long Term Care Effective	Process Lead

1.2.2-14 Percentage of patients on any statin (HMG CoA Reductase Inhibitors) with both an ALT and an AST liver enzyme test in the measurement year

NCQA
 Drug
 All
 Effective
 Process
 Lead

Ischemic Heart Disease

1.2.2-15 Acute myocardial infarction (AMI): percentage of AMI patients prescribed a statin at hospital discharge.

Canadian Cardiovascular Outcomes Research Team(19)
 Drug
 Amb/Hosp
 Effective
 Process
 Lead

1.2.2-16 Acute myocardial infarction: percent of patients with elevated lipoprotein cholesterol (LDL-c greater than or equal to 130 mg/dL or narrative equivalent) who are prescribed a lipid-lowering medication at hospital discharge.

Joint Commission on Accreditation of low-density Healthcare Organizations(39)
 Drug
 Hospital
 Effective
 Process
 Lead

Other

1.2.2-17 Advanced chronic kidney disease (CKD): percent of patients on lipid lowering treatment.

Renal Physicians Association(35)
 Drug
 All
 Effective
 Process
 Lead

1.2.3 Adequacy of Therapy: Influenza vaccine:

Two measures were identified specific to diabetes and influenza administration.

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary
Donabedian
Lead/Lag

Specific Category:

Diabetes

1.2.3-1 Adult diabetes: percentage of patients who received an influenza immunization during the recommended calendar period.

National Diabetes Quality Improvement Alliance(20)
 Drug
 All
 Effective
 Process
 Lead

1.2.3-2 Adult diabetes: percentage of eligible patients who received an immunization or refused immunization during the calendar period.

National Diabetes Quality Improvement Alliance(20)
 Drug
 All
 Effective
 Process
 Lead

When querying the database for all measures specific to immunizations, 21 additional measures were identified:

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary
Donabedian
Lead/Lag

Specific Category:

Infectious Disease

1.2.3-3 Influenza immunization: percent of applicable patients receiving influenza immunizations between September 1, 2004 and January 31, 2005 (spinal cord injury & disorder [SCI&D] cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Timely	Process Lead
1.2.3-4 Immunizations: percentage of two-year-olds who are up-to-date with their primary series of immunizations (DTaP, IPV, MMR, PCV7, VZV, Hib, Hep B).	Institute for Clinical Systems Improvement(103) Drug Ambulatory Effective	Process Lead
1.2.3-5 Immunizations: percentage of young adults who are up-to-date with Hepatitis B (Hep B).	Institute for Clinical Systems Improvement(103) Drug Ambulatory Effective	Process Lead
1.2.3-6 Preventive services for children and adolescents: percentage of patients who are up-to-date with recommended immunizations.	Institute for Clinical Systems Improvement(103) Drug Ambulatory Effective	Process Lead
1.2.3-7 Childhood immunization: percentage of patients who received their primary course of immunizations (i.e., DPT-HiB, polio x4, and MMR) by age 24 months.	Manitoba Centre for Health Policy(13) Drug Ambulatory Timely	Process Lead
1.2.3-8 Adolescent immunization status: percentage of adolescents who had a second dose of MMR, three hepatitis B and one chicken pox vaccination by their 13th birthday (Combination #2).	National Committee for Quality Assurance(38) Drug Ambulatory Effective	Process Lead
1.2.3-9 Childhood immunizations (full coverage): percent of enrolled children who received all of the following by the measure end date: four DTaP, DT, or DTP with different dates of service, or some combination of DTaP, DTP or DTP/DT vaccines adding up to 4 doses, three polio (IPV/OPV) vaccinations with different dates of service, one measles vaccination, one mumps vaccination, one rubella vaccination or one MMR vaccination, one varicella (VZV) vaccination, three H influenza type B (Hib) vaccinations, three hepatitis B vaccinations (MEDDIC-MS). [NQMC Update Pending]	State of Wisconsin, Department of Health and Family Services(44) Drug Ambulatory Timely	Process Lead
1.2.3-10 Immunizations: percentage of adolescents who are up-to-date with recommended immunizations (Hep B, MMR, tetanus, and verification of varicella immunity).	Institute for Clinical Systems Improvement(103) Drug Ambulatory Effective	Process Lead
1.2.3-11 Influenza immunization: percent of applicable patients receiving influenza immunizations between September 1, 2004 and January 31, 2005 (NEXUS clinics cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Timely	Process Lead
1.2.3-12 Pregnant women not immune to rubella should postpartum	RAND	

immunization within 6 weeks.	Drug Amb/Hosp Effective	Process Lead
1.2.3-13 Pneumococcal pneumonia: percent of applicable patients receiving pneumococcal immunization (spinal cord injury & disorder [SCI&D] cohort). [NQMC Update Pending]	Veterans Health Administration(53) Drug All Timely	Process Lead
1.2.3-14 Percentage of patients [50-64] who received an influenza vaccination.	Ambulatory Care Quality Alliance (AQA) Drug Ambulatory Timely	Process Lead
1.2.3-15 Percentage of patients who ever received a pneumococcal vaccine.	Ambulatory Care Quality Alliance (AQA) Drug Ambulatory Timely	Process Lag
1.2.3-16 Immunization, childhood: Infant mortality per 1,000 live births, by birth weight	National Healthcare Quality Report (NHQR) Indirect Amb/Hosp Effective	Process Lag
1.2.3-17 Immunization, pneumonia: Persons 65 and over who ever received pneumococcal vaccination	National Healthcare Quality Report (NHQR) Drug All Timely	Process Lead
1.2.3-18 All patients aged 65 and over should have been offered influenza vaccine annually or have documentation that they received it elsewhere.	RAND Drug All Timely	Process Lead
1.2.3-19 All patients under age 65 with any of the following conditions should have been offered influenza vaccination annually: living in a nursing home, chronic obstructive pulmonary disease, chronic cardiovascular disorders, renal failure, immunosuppression, diabetes mellitus, hemoglobinopathies (e.g., sickle cell).	RAND Drug All Effective	Process Lead
1.2.3-20 There should be documentation that all patients aged 65 and older presenting for care were offered pneumococcal vaccine at least once.	RAND Drug All Effective	Process Lead
1.2.3-21 There should be documentation that all patients in the following groups and otherwise presenting for care were offered pneumococcal vaccine at least once: chronic cardiac or pulmonary disease, diabetes mellitus, anatomic asplenia, and persons over age 50 who are institutionalized.	RAND Drug All Effective	Process Lead

1.2.3-22 Childhood immunizations (partial coverage): percent of enrolled children who received all of the following by the measure end date: three DTaP, DT, or DTP with different dates of service, or some combination of DTaP, DTP or DTP/DT vaccines adding up to 3 doses, three polio (IPV/OPV) vaccinations with different dates of service, one measles vaccination, one mumps vaccination, one rubella vaccination or one MMR vaccination, two H influenza type B (Hib) vaccinations, two hepatitis B vaccinations (MEDDIC-MS). [NQMC Update Pending]

State of Wisconsin, Department of Health and Family Services(44)
 Drug
 Ambulatory
 Effective
 Process
 Lead

Preventive Care

1.2.3-23 Childhood immunization status: percentage of children who had four DTaP/DT, three IPV, one MMR, three haemophilus influenza type B, three hepatitis B and one chicken pox vaccination by the child's second birthday (Combination #2).

National Committee for Quality Assurance(38)
 Drug
 Ambulatory
 Effective
 Outcome
 Lag

2. Hyperlipidemia

2.1 Adherence and Persistence: medication possession ratio

As with previous categories, the MPR was not identified as a measure. Seventeen measures were identified relating to lipid lowering medications being “prescribed” or “received.”

Specific Category:

Coronary Artery Disease

2.1-1 IF a vulnerable elder has established coronary heart disease and an LDL cholesterol level greater than 130 mg/dL and a trial of step II diet therapy was not offered or was ineffective, THEN he or she should be offered cholesterol-lowering medication.

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary
Donabedian
Lead/Lag

ACOVE Quality Indicators
 Drug
 All
 Effective
 Lead
 Process

2.1-2 Chronic stable coronary artery disease (CAD): percentage of patients who were prescribed lipid lowering therapy.

Physician Consortium for Performance Improvement(53)
 Drug
 All
 Effective
 Lead
 Process

2.1-3 Percentage of patients with CAD who were prescribed a lipid-lowering therapy (based on current ACC/AHA guidelines).

Ambulatory Care Quality Alliance (AQA)
 Drug
 Ambulatory
 Effective
 Lead
 Process

2.1-4 CAD: Drug Therapy for Lowering LDL Cholesterol: Percentage of patients with CAD who were prescribed a lipid-lowering therapy (based on current ACC/AHA guidelines) 1

NCQA#
 Drug
 All
 Effective
 Lead
 Process

2.1-5 Percentage of patients who were prescribed a lipid-lowering therapy

NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care

	Drug All Effective	Lead Process
2.1-6 Percentage of patients whose most recent LDL-C is <130 mg/dl or receiving a statin or other lipid-lowering therapy.	National Diabetes Quality Improvement Alliance Performance Measurement Set for Adult Diabetes Drug All Effective	Lead Process
2.1-7 Percentage of patients whose most recent LDL-C is <100 mg/dl or receiving a statin or other lipid-lowering therapy.	National Diabetes Quality Improvement Alliance Performance Measurement Set for Adult Diabetes Drug All Effective	Lead Process
2.1-8 Patients without preexisting coronary disease who are started on pharmacological treatment for hyperlipidemia should have had at least 2 measurements of their cholesterol (total or LDL) documented in the year before the start of pharmacological treatment.	RAND Drug All Efficient	Lead Process
2.1-9 Patients under age 75 with preexisting coronary disease who have an untreated LDL cholesterol level >130 mg/dl should begin diet or drug therapy within 3 months of the high LDL measurement.	RAND Drug All Effective	Lead Process
2.1-10 Patients under age 75 with preexisting coronary disease who have an LDL level >130 mg/dl after 6 months of dietary cholesterol-lowering treatment should receive pharmacological therapy for hyperlipidemia within 2 months of measurement.	RAND Drug All Effective	Lead Process
2.1-11 Patients in whom pharmacological therapy for hyperlipidemia has been initiated should have their total cholesterol, HDL, and LDL rechecked within 4 months.	RAND Monitoring Amb/Long Term Care Effective	Lead Process
2.1-12 Patients receiving pharmacological therapy for hyperlipidemia who have had a dosage or medication change should have total cholesterol, HDL, and LDL rechecked within 4 months of the change.	RAND Monitoring Amb/Long Term Care Effective	Lead Process
2.1-13 Percentage of patients on any statin (HMG CoA Reductase Inhibitors) with both an ALT and an AST liver enzyme test in the measurement year	NCQA Drug All Effective	Lead Process
Diabetes		
2.1-14 IF a diabetic vulnerable elder has a fasting total cholesterol level of 240 g/dL or greater, THEN he or she should be offered an intervention to lower cholesterol.	ACOVE Quality Indicators Drug All Effective	Lead Process

Ischemic Heart Disease

2.1-15 Acute myocardial infarction (AMI): percentage of AMI patients prescribed a statin at hospital discharge.

Canadian Cardiovascular Outcomes Research Team(19)
 Drug
 Amb/Hosp
 Effective
 Lead
 Process

2.1-16 Acute myocardial infarction: percent of patients with elevated low-density lipoprotein cholesterol (LDL-c greater than or equal to 130 mg/dL or narrative equivalent) who are prescribed a lipid-lowering medication at hospital discharge.

Joint Commission on Accreditation of Healthcare Organizations(39)
 Drug
 Hospital
 Effective
 Lead
 Process

Other

2.1-17 Advanced chronic kidney disease (CKD): percent of patients on lipid lowering treatment.

Renal Physicians Association(35)
 Drug
 All
 Effective
 Lead
 Process

3. Respiratory Disorders:

3.1 Adherence & Persistence – Medication Possession Ratio

As was seen with the scan for measures for medication possession ratio in diabetes and hyperlipidemia, no direct MPR measures have been directly identified. Again, it is possible that this could exist within the definitions of some of the measures. The query was performed for asthma and COPD measures with the word “prescribed” in the measure description to identify measures relating to adherence and persistence. Seventeen measures were identified

Specific Category:

Asthma

3.1-1 Percentage of all patients with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary
Donabedian Lead/Lag

NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care
 Drug
 All
 Effective
 Lead
 Process

3.1-2 Percentage of individuals who were identified as having persistent asthma during the year prior to the measurement year and who were appropriately prescribed asthma medications (e.g. inhaled corticosteroids) during the measurement year

Ambulatory Care Quality Alliance (AQA)
 Drug
 Ambulatory
 Effective
 Lead
 Process

3.1-3 Percentage of all individuals with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment.

Ambulatory Care Quality Alliance (AQA)
 Drug
 Ambulatory
 Effective
 Lead
 Process

3.1-4 Management of asthma: People with persistent asthma prescribed medications acceptable as primary therapy for

National Healthcare Quality Report (NHQR)
 Drug
 Lead

long-term control of asthma (inhaled corticosteroids)	All Effective	Process
3.1-5 Asthma: Pharmacologic therapy: Percentage of all patients with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment.	Drug All Effective	Lead Process
3.1-6 Percentage of individuals who were identified as having persistent asthma during the year prior to the measurement year and who were appropriately prescribed asthma medications (e.g. inhaled corticosteroids) during the measurement year	Recommended Starter Set Clinical Performance Measures for Ambulatory Care (AQA) Drug All Effective	Lead Process
3.1-7 Asthma: percentage of patients aged 5 to 40 years diagnosed with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment.	Physician Consortium for Performance Improvement(53) Drug Ambulatory Effective	Lead Process
3.1-8 percentage of patients who were identified as having persistent asthma during the year prior to the measurement year and who were prescribed either an inhaled corticosteroid or acceptable alternative medication during the measurement year	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Lead Process
3.1-9 Asthma: percentage of patients aged 5 to 40 years diagnosed with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment.	American Medical Association on behalf of the Physician Consortium for Performance Improvement(23) Drug All Effective	Lead Process
3.1-10 Patients with the diagnosis of moderate-to-severe asthma should have been prescribed a beta2-agonist inhaler for symptomatic relief of exacerbations	RAND Drug All Effective	Lead Process
3.1-11 Patients who report using a beta2-agonist inhaler more than 3 times per day on a daily basis (not only during an exacerbation) should be prescribed a longer acting bronchodilator (theophylline) and/or an anti-inflammatory agent (inhaled corticosteroids, cromolyn)	RAND Drug All Effective	Lead Process
3.1-12 Patients requiring chronic treatment with systemic corticosteroids during any 12 month period should have been prescribed inhaled corticosteroids during that same time period.	RAND Drug All Safe	Lag Process
3.1-13 Patients newly prescribed inhaled bronchodilators should be concurrently given either a spacer device or instructions in proper use of an MDI.	RAND Drug All Effective	Lead Process

3.1-14 Percentage of enrolled members 5 to 56 years of age who were identified as having persistent asthma and who were appropriately prescribed medication deemed acceptable by the NHLBI as preferred therapy for long-term asthma control.	NCQA HEDIS Drug All Effective	Lead Process
3.1-15 Patients newly prescribed inhaled bronchodilators should be concurrently given either a spacer device or instructions in proper use of an MDI.	RAND Drug All Effective	Lead Process
3.1-16 Percentage of all individuals with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroids) or an acceptable alternative treatment	Recommended Starter Set Clinical Performance Measures for Ambulatory Care (AQA) Drug All Effective	Lead Process

COPD

3.1-17 COPD - Inhaled Bronchodilator Therapy: Percentage of symptomatic patients with COPD who were prescribed an inhaled bronchodilator.	Drug All Effective	Lead Process
---	--------------------------	-----------------

**3.2 Respiratory Disease – Adequacy of Therapy
Absence of long term controller (inhaled steroid, leukotriene antagonist, etc.)
in patients with frequent refills of albuterol inhaler.**

Twelve measures were identified related to long term controller use:

<u>Specific Category:</u>	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
Asthma		
3.2-1 Percentage of enrolled members 5 to 56 years of age who were identified as having persistent asthma and who were appropriately prescribed medication deemed acceptable by the NHLBI as preferred therapy for long-term asthma control.	NCQA HEDIS Drug All Effective	Lead Process
3.2-2 Patients requiring chronic treatment with systemic corticosteroids during any 12 month period should have been prescribed inhaled corticosteroids during that same time period.	RAND Drug All Safe	Lag Process
3.2-3 Distribution of long-term control therapy by category of medication, severity classification, and age range	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Lead Process
3.2-4 Percentage of all patients with mild, moderate, or severe	NQF-Endorsed National Voluntary Consensus	

persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment	Standards for Physician-Focused Ambulatory Care Drug All Effective Lead Process
3.2-5 Percentage of patients who were identified as having persistent asthma during the year prior to the measurement year and who were prescribed either an inhaled corticosteroid or acceptable alternative medication during the measurement year	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective Lead Process
3.2-6 Percentage of all individuals with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroids) or an acceptable alternative treatment	Recommended Starter Set Clinical Performance Measures for Ambulatory Care (AQA) Drug All Effective Lead Process
3.2-7 Percentage of individuals who were identified as having persistent asthma during the year prior to the measurement year and who were appropriately prescribed asthma medications (e.g. inhaled corticosteroids) during the measurement year	Recommended Starter Set Clinical Performance Measures for Ambulatory Care (AQA) Drug All Effective Lead Process
3.2-8 Asthma: Pharmacologic therapy: Percentage of all patients with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment.	Drug All Effective Lead Process
3.2-9 Use of appropriate medications for people with asthma: Percentage of patients who were identified as having persistent asthma during the measurement year and the year prior of the measurement year and who were dispensed a prescription for either an inhaled corticosteroid or acceptable alternative medication during the measurement year.	Drug All Effective Lead Process
3.2-10 Management of asthma: People with persistent asthma prescribed medications acceptable as primary therapy for long-term control of asthma (inhaled corticosteroids)	National Healthcare Quality Report (NHQR) Drug All Effective Lead Process
3.2-11 Percentage of all individuals with mild, moderate, or severe persistent asthma who were prescribed either the preferred long-term control medication (inhaled corticosteroid) or an acceptable alternative treatment.	Ambulatory Care Quality Alliance (AQA) Drug Ambulatory Effective Lead Process
3.2-12 Percentage of individuals who were identified as having persistent asthma during the year prior to the measurement year and who were appropriately prescribed asthma medications (e.g. inhaled corticosteroids) during the measurement year	Ambulatory Care Quality Alliance (AQA) Drug Ambulatory Effective Lead Process

4. Hypertension:

4.1 Adherence & Persistence – Medication Possession Ratio

Forty-four measures were identified specifically for hypertension. Again, no measures were identified specific to the medication possession ratio. Most measures are currently related to blood pressure measurement. The previously used methods of using the word “prescribed” to find measures specific to adherence and persistence did not work with these measures. Using keywords “offered” and “initiated” identified seven measures basically only relating to the start of therapy. No measures were identified that were more specific to adherence with anti-hypertensive medications.

Specific Category:

Creator

Pharmacy Relevance

Care Setting

IOM Aim primary

Donabedian

Lead/Lag

Hypertension

4.1-1 Patients in risk group C with Stage 1 hypertension should be offered pharmacotherapy.	RAND Drug All Effective	Process Lead
4.1-2 Patients in any risk group with Stage 2 or 3 hypertension should be offered pharmacotherapy.	RAND Drug All Effective	Process Lead
4.1-3 Patients in risk group HN-C should be offered pharmacotherapy.	RAND Drug All Effective	Process Lead
4.1-4 Stage 1A hypertensives whose blood pressure remains Stage 1 after 12 months of lifestyle modification should be offered pharmacotherapy.	RAND Drug All Effective	Process Lag
4.1-5 Stage 1B hypertensives whose blood pressure remains Stage 1 after 6 months of lifestyle modification should be offered pharmacotherapy.	RAND Drug All Effective	Process Lag
4.1-6 IF a vulnerable elder has hypertension and has renal parenchymal disease with a serum creatinine concentration greater than 1.5 mg/dL or more than 1 g of protein/24 h of collected urine, THEN therapy with an ACE inhibitor should be offered.	ACOVE Quality Indicators Drug All Effective	Process Lead
4.1-7 IF a vulnerable elder remains hypertensive after nonpharmacologic intervention, THEN pharmacologic antihypertensive treatment should be initiated.	ACOVE Quality Indicators Indirect Amb/Long Term Care Effective	Process Lag

5. Heart Failure:

5.1 Adherence & Persistence – Medication Possession Ratio

One-hundred fifty measures were identified specific to Heart Failure. Fifty of these measures are related to “prescribing” or “offering” medications. None of the identified measures are specific to the MPR. Most of these measures appear to be at a very basic level of measuring if the processes of care are in place and guidelines are being followed to simply begin the process of getting the patient the appropriate medication(s).

Specific Category:

Heart Failure

5.1-1 HF: Warfarin Therapy for Patients with Atrial Fibrillation:

Creator
Pharmacy Relevance
Care Setting
IOM Aim primary

Donabedian
Lead/Lag

AMA PCPI/* ACC/

Percentage of patients with HF who also have paroxysmal or chronic atrial fibrillation who were prescribed warfarin therapy ¹	Drug All Effective	Process Lead
5.1-2 HF: ACEI/ARB Therapy: Percentage of patients with HF who also have LVSD who were prescribed ACE inhibitor or ARB therapy ¹	AHA Drug All Effective	Process Lead
5.1-3 HF: Beta Blocker Therapy: Percentage of patients with HF who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy ¹	AMA PCPI/* ACC/ Drug All Effective	Process Lead
5.1-4 ACE inhibitor (ACE-I) or Angiotensin Receptor Blocker (ARBs) for left ventricular systolic dysfunction (Measure was previously “ACE-I for left ventricular systolic dysfunction”; effective 1Q2005 discharges)	Hospital Quality Alliance (HQA) Drug All Effective	Process Lead
5.1-5 Percentage of patients who also have LVSD who were prescribed ACE inhibitor therapy	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Process Lead
5.1-6 IF a vulnerable elder has heart failure and atrial fibrillation AND documented contraindications to anticoagulation, THEN aspirin should be offered.	ACOVE Quality Indicators Drug All Effective	Process Lead
5.1-7 Patients with a diagnosis of heart failure who have an ejection fraction of less than 40% and no contraindications to ACE inhibitors should be receiving an ACE inhibitor.	RAND Drug All Effective	Process Lead
5.1-8 IF a vulnerable elder has heart failure, left ventricular ejection fraction of 40% or less, and New York Heart Association class I to III disease, THEN a beta blocker should be offered unless the patient has a documented contraindication (for example, uncompensated heart failure)	ACOVE Quality Indicators Drug All Effective	Process Lead
5.1-9 IF a vulnerable elder has symptomatic heart failure and left ventricular ejection fraction of 40% or less, THEN he or she should be offered treatment with an ACE inhibitor	ACOVE Quality Indicators Drug All Effective	Process Lead
5.1-10 IF a vulnerable elder has asymptomatic left ventricular dysfunction with a left ventricular ejection fraction of 40% or less, THEN an ACE inhibitors should be offered.	ACOVE Quality Indicators Drug All Effective	Process Lead

5.1-11 Percentage of patients who also have LVSD who were prescribed beta-blocker therapy	<p>NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-12 Heart Failure: Use of other drug therapies in heart failure: digoxin	<p>SCRIPT</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-13 Heart failure: percent of patients with ejection fraction less than 40 and a principal discharge diagnosis of heart failure who were on angiotensin-converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) prior to admission (inpatient heart failure antecedent cohort). [NQMC Update Pending]	<p>Veterans Health Administration(53)</p> <p>Drug Hospital Effective</p> <p>Process Lead</p>
5.1-14 Heart Failure: Percentage of patients receiving target dose of ACEI: received at least the target dose	<p>SCRIPT</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-15 Heart Failure: Percentage of patients receiving target dose of ACEI: received at least half of the target dose	<p>SCRIPT</p> <p>Follow-up All Effective</p> <p>Process Lead</p>
5.1-16 Heart Failure: Use of other drug therapies in heart failure: diuretics	<p>SCRIPT</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-17 Heart Failure: Use of other drug therapies in heart failure: beta-blockers	<p>SCRIPT</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-18 Heart Failure: Prescribing of after-load reducing drugs (excluding patients with contraindications and other potential decision-modifying factors): (ACE/ARB/hydralazine plus nitrates (total))	<p>SCRIPT</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-19 Heart Failure: Prescribing of after-load reducing drugs (excluding patients with contraindications and other potential decision-modifying factors): hydralzaine plus nitrates	<p>SCRIPT</p> <p>Drug All Effective</p> <p>Process Lead</p>
5.1-20 Heart Failure: Prescribing of after-load reducing drugs (excluding patients with contraindications and other	<p>SCRIPT</p> <p>Drug</p> <p>Process</p>

potential decision-modifying factors): ARB	All Effective	Lead
5.1121 Heart Failure: Prescribing of after-load reducing drugs (excluding patients with contraindications and other potential decision-modifying factors): ACE inhibitors	SCRIPT Drug All Effective	Process Lead
5.1-22 Heart Failure: Use of other drug therapies in heart failure: spironolactone	SCRIPT Drug All Effective	Process Lead
5.1-23 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	American College of Cardiology(23) Drug All Effective	Process Lead
5.1-24 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have paroxysmal or chronic atrial fibrillation who were prescribed warfarin therapy.	Physician Consortium for Performance Improvement(53) Drug All Effective	Process Lead
5.1-25 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	Physician Consortium for Performance Improvement(53) Drug All Effective	Process Lead
5.1-26 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	Physician Consortium for Performance Improvement(53) Drug All Effective	Process Lead
5.1-27 Heart failure: percentage of patient visits with weight measurement recorded for patients aged greater than or equal to 18 years with diagnosed heart failure (HF).	Physician Consortium for Performance Improvement(53) Monitoring All Effective	Process Lead
5.1-28 Heart failure: percent of patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.	Joint Commission on Accreditation of Healthcare Organizations(39) Drug Hospital Effective	Process Lead
5.1-29 Heart failure in adults: percent of adult patients with a diagnosis of heart failure (HF) who are on an angiotensin-converting enzyme (ACE) inhibitor or	Institute for Clinical Systems Improvement(103) Drug Amb/Hosp	Process Lead

angiotensin receptor blocker (ARB) at discharge, or before/at the time of the clinic visit.	Effective	
5.1-30 Heart failure: percentage of patients with heart failure prescribed pharmacologic agents consistent with type of ventricular dysfunction.	American Medical Directors Association(64) Follow-up All Effective	Process Lag
5.1-31 Heart failure: percentage of patients with heart failure with fluid volume overload prescribed a loop diuretic.	American Medical Directors Association(64) Drug All Effective	Process Lag
5.1-32 Congestive heart failure (CHF): percentage of CHF patients prescribed beta-blocker at hospital discharge.	Canadian Cardiovascular Outcomes Research Team(19) Drug Amb/Hosp Timely	Process Lead
5.1-33 Heart failure: percentage of patients with heart failure prescribed pharmacologic agents consistent with severity of heart failure.	American Medical Directors Association(64) Drug All Effective	Process Lag
5.1-34 Heart failure: percentage of patients with heart failure prescribed pharmacologic agents consistent with patient's advance care directive.	American Medical Directors Association(64) Drug All Effective	Process Lag
5.1-35 Heart failure: percentage of patients with heart failure on beta-blocker.	American Medical Directors Association(64) Drug All Effective	Process Lag
5.1-36 Heart failure: percentage of patients with heart failure on angiotensin-converting enzyme (ACE) inhibitor.	American Medical Directors Association(64) Drug All Effective	Outcome Lag
5.1-37 Heart failure: percent of patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.	Centers for Medicare & Medicaid Services(130) Drug Amb/Hosp Effective	Process Lead
5.1-38 Congestive heart failure (CHF): percentage of CHF patients prescribed angiotensin-converting enzyme (ACE) inhibitor at hospital discharge.	Canadian Cardiovascular Outcomes Research Team(19) Drug Amb/Hosp Timely	Process Lead
5.1-39 Congestive heart failure (CHF): percentage of CHF	Canadian Cardiovascular Outcomes Research	

patients who received instructions regarding discharge medications.	Team(19) Patient Counseling Amb/Hosp Effective	Process Lead
5.1-40 Congestive heart failure (CHF): percentage of CHF patients who received discharge instructions regarding follow-up appointment.	Canadian Cardiovascular Outcomes Research Team(19) Patient Counseling Hospital Effective	Process Lead
5.1-41 Congestive heart failure (CHF): percentage of CHF patients prescribed warfarin for atrial fibrillation at hospital discharge.	Canadian Cardiovascular Outcomes Research Team(19) Drug Amb/Hosp Timely	Process Lead
5.1-42 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	American Heart Association(23) Drug All Effective	Process Lead
5.1-43 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	American Heart Association(23) Drug All Effective	Process Lead
5.1-44 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have paroxysmal or chronic atrial fibrillation who were prescribed warfarin therapy.	American College of Cardiology(23) Drug All Effective	Process Lead
5.1-48 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	American College of Cardiology(23) Drug All Effective	Process Lead
5.1-45 Heart failure: average time for a patient's ineffective treatment to be modified.	American Medical Directors Association(64) Drug All Effective	Process Lag
5.1-46 Heart failure: percent of patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.	Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30) Drug Hospital Effective	Process Lag
5.1-47 Heart failure: percentage of patients with documented consideration of beta-blocker treatment.	American Medical Directors Association(64) Follow-up	Process

	All Effective	Lead
5.1-48 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have paroxysmal or chronic atrial fibrillation who were prescribed warfarin therapy.	American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23) Drug All Effective	Process Lead
5.1-49 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23) Drug All Effective	Process Lead
5.1-50 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23) Drug All Effective	Process Lead

5.2 Heart Failure: Adequacy of Therapy: Presence of Beta-Blocker

Eight measures were identified specific to Heart Failure and Beta-Blockers.

<u>Specific Category:</u>	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
Heart Failure		
5.2-1 Congestive heart failure (CHF): percentage of CHF patients prescribed beta-blocker at hospital discharge.	Canadian Cardiovascular Outcomes Research Team(19) Drug Amb/Hosp Timely	Process Lead
5.2-2 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23) Drug All Effective	Process Lead

5.2-3 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	American Heart Association(23) Drug All Effective	Process Lead
5.2-4 Percentage of patients who also have LVSD who were prescribed beta-blocker therapy	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Process Lead
5.2-5 IF a vulnerable elder has heart failure, left ventricular ejection fraction of 40% or less, and New York Heart Association class I to III disease, THEN a beta blocker should be offered unless the patient has a documented contraindication (for example, uncompensated heart failure)	ACOVE Quality Indicators Drug All Effective	Process Lead
5.2-6 HF: Beta Blocker Therapy: Percentage of patients with HF who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy1	AMA PCPI/* ACC/ Drug All Effective	Process Lead
5.2-7 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed beta-blocker therapy.	Physician Consortium for Performance Improvement(53) Drug All Effective	Process Lead
5.2-8 Heart Failure: Use of other drug therapies in heart failure: beta-blockers	SCRIPT Drug All Effective	Process Lead

Measures for Beta-Blockers were also found to exist in other classifications that may pertain to Heart Failure or that may be useful in developing measures specific to Heart Failure. When the database was queried for Beta-Blockers in all categories, twenty-three additional measures were identified.

<u>Specific Category:</u> Asthma	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
5.2-9 Patients with moderate-to-severe asthma should not receive beta-blocker medications (e.g. atenolol, propranolol).	RAND Drug All Safe	Process Lead

Coronary Artery Disease

5.2-10 Coronary Artery Disease: Prescribing of drug therapies among patients with CAD and past MI: beta blocker

SCRIPT
 Drug
 All
 Effective
 Process
 Lead

5.2-11 Chronic stable coronary artery disease (CAD): percentage of patients with prior myocardial infarction (MI) who were prescribed beta-blocker therapy.

Physician Consortium for Performance Improvement(53)
 Drug
 All
 Effective
 Process
 Lead

5.2-12 Chronic stable coronary artery disease (CAD): percentage of patients with prior myocardial infarction (MI) who were prescribed beta-blocker therapy.

American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23)
 Drug
 All
 Effective
 Process
 Lead

5.2-13 Chronic stable coronary artery disease (CAD): percentage of patients with prior myocardial infarction (MI) who were prescribed beta-blocker therapy.

American Heart Association(23)
 Drug
 All
 Effective
 Process
 Lead

5.2-14 Percentage patients hospitalized with AMI who received persistent beta-blocker treatment (6 months after discharge).

Ambulatory Care Quality Alliance (AQA)
 Drug
 Ambulatory
 Effective
 Process
 Lag

5.2-15 CAD: Beta-Blocker Treatment after a Heart Attack: Percentage of patients hospitalized with an AMI during the measurement year who were prescribed beta-blocker therapy3

NCQA#
 Drug
 All
 Effective
 Process
 Lead

5.2-16 CAD: Beta-Blocker Therapy-Prior Myocardial Infarction (MI) : Percentage of patients with prior MI at any time who were prescribed beta-blocker therapy1

AMA PCPI/* ACC/
 Drug
 All
 Effective
 Process
 Lead

Hypertension

5.2-17 IF a vulnerable elder has hypertension and asthma, THEN beta-blocker therapy for hypertension should not be used.

ACOVE Quality Indicators
 Drug
 All
 Safe
 Process
 Lead

Ischemic Heart Disease

5.2-18 Patients discharged after an acute myocardial infarction should be discharged on a beta-blocker (unless they have contraindications to beta-blockers).

RAND
 Drug
 Amb/Hosp
 Process
 Lead

5.2-19 Post-myocardial infarction care: percentage of patients discharged alive from hospital in the preceding three years with a discharge diagnosis of myocardial infarction (MI) (excluding those with prior diagnosis of asthma, chronic obstructive pulmonary disease [COPD] or peripheral vascular disease) who filled at least one prescription for a beta-blocker within four months of the first infarction.	Effective	Manitoba Centre for Health Policy(13) Drug All Effective Process Lead
5.2-20 Beta blocker prescribed at discharge	Hospital Quality Alliance (HQA) Drug Hospital Effective	Process Lead
5.2.21 Percentage of patients hospitalized with acute myocardial infarction (AMI) who received an ambulatory prescription for beta-blocker therapy (within 7 days discharge).	Ambulatory Care Quality Alliance (AQA) Drug Amb/Hosp Timely	Process Lead
5.2-22 Patients admitted with acute myocardial infarction should receive a beta-blocker within 12 hours of admission (unless they have contraindications to beta-blockers).	RAND Drug Hospital Effective	Process Lead
5.2-23 Acute myocardial infarction: percent of patients without beta blocker contraindications who received a beta blocker within 24 hours after hospital arrival.	Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30) Drug Hospital Effective	Process Lead
5.2-24 Percentage of patients with prior MI who were prescribed beta-blocker therapy	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Process Lead
5.2-25 IF a vulnerable elder has unstable angina or an acute myocardial infarction, THEN he or she should be offered beta-blocker therapy within 12 hours of presentation.	ACOVE Quality Indicators Drug Hospital Effective	Process Lead
5.2-26 IF a vulnerable elder has had an acute myocardial infarction, THEN he or she should be offered a beta-blocker.	ACOVE Quality Indicators Drug Hospital Effective	Process Lead
5.2-27 Acute myocardial infarction (AMI): percentage of AMI patients who received beta-blockers within	Canadian Cardiovascular Outcomes Research Team(19)	

12 hours of admission.	Drug Hospital Timely	Process Lead
5.2-28 Acute myocardial infarction (AMI): percentage of AMI patients who were prescribed beta-blocker at hospital discharge.	Canadian Cardiovascular Outcomes Research Team(19) Drug Amb/Hosp Timely	Process Lead
5.2-29 Acute myocardial infarction: percent of patients without beta blocker contraindications who are prescribed a beta blocker at hospital discharge.	Centers for Medicare & Medicaid Services(130) Drug Hospital Effective	Process Lead
5.2-30 Acute myocardial infarction: percent of patients without beta blocker contraindications who received a beta blocker within 24 hours after hospital arrival.	Centers for Medicare & Medicaid Services(130) Drug Hospital Timely	Process Lead
5.2-31 Acute myocardial infarction: percent of patients without beta blocker contraindications who are prescribed a beta blocker at hospital discharge.	Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30) Drug Hospital Effective	Process Lag
5.2-32 Patients admitted with the diagnosis of unstable angina who have angina > 5 minutes at rest associated with ischemic ST segment changes should receive beta-blockers within 4 hours (unless they have contraindications to beta-blockers).	RAND Drug Hospital Effective	Process Lead

5.3 Heart Failure: Adequacy of Therapy: Presence of ACE/ARB

Twenty measures were identified specific to Heart Failure and ACE Inhibitors/Angiotensin Receptor Blockers that would fall into the category of measuring/indicating adequacy of therapy.

	<u>Creator</u>	
	<u>Pharmacy Relevance</u>	<u>Donabedian</u>
	<u>Care Setting</u>	<u>Lead/Lag</u>
	<u>IOM Aim primary</u>	
<u>Specific Category:</u> <u>Heart Failure</u>		
5.3-1 HF: ACEI/ARB Therapy: Percentage of patients with HF who also have LVSD who were prescribed ACE inhibitor or ARB therapy ¹	AHA Drug All Effective	Process Lead

5.3-2 Heart Failure: Prescribing of after-load reducing drugs (excluding patients with contraindications and other potential decision-modifying factors): ACE inhibitors	SCRIPT Drug All Effective	Process Lead
5.3-3 Heart Failure: Prescribing of after-load reducing drugs (excluding patients with contraindications and other potential decision-modifying factors): ARB	SCRIPT Drug All Effective	Process Lead
5.3-4 Heart Failure: Percentage of patients receiving target dose of ACEI: received at least half of the target dose	SCRIPT Follow-up All Effective	Process Lead
5.3-5 Heart Failure: Percentage of patients receiving target dose of ACEI: received at least the target dose	SCRIPT Drug All Effective	Process Lead
5.3-6 Heart failure in adults: percent of adult patients with a diagnosis of heart failure (HF) who are on an angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) at discharge, or before/at the time of the clinic visit.	Institute for Clinical Systems Improvement(103) Drug Amb/Hosp Effective	Process Lead
5.3-7 Heart failure: percent of patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.	Joint Commission on Accreditation of Healthcare Organizations(39) Drug Hospital Effective	Process Lead
5.3-8 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	Physician Consortium for Performance Improvement(53) Drug All Effective	Process Lead
5.3-10 ACE inhibitor (ACE-I) or Angiotensin Receptor Blocker (ARBs)) for left ventricular systolic dysfunction (Measure was previously "ACE-I for left ventricular systolic dysfunction"; effective 1Q2005 discharges)	Hospital Quality Alliance (HQA) Drug All Effective	Process Lead
5.3-11 Heart failure: percent of patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.	Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30) Drug Hospital Effective	Process Lag

5.3-12 Patients with a diagnosis of heart failure who have an RAND ejection fraction of less than 40% and no contraindications to ACE inhibitors should be receiving an ACE inhibitor.	Drug All Effective	Process Lead
5.3-13 IF a vulnerable elder has asymptomatic left ventricular dysfunction with a left ventricular ejection fraction of 40% or less, THEN an ACE inhibitors should be offered.	ACOVE Quality Indicators Drug All Effective	Process Lead
5.3-14 IF a vulnerable elder has symptomatic heart failure and left ventricular ejection fraction of 40% or less, THEN he or she should be offered treatment with an ACE inhibitor	ACOVE Quality Indicators Drug All Effective	Process Lead
5.3-15 Percentage of patients who also have LVSD who were prescribed ACE inhibitor therapy	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Effective	Process Lead
5.3-16 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure also have left ventricular systolic dysfunction (LVSD) who (HF) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	American College of Cardiology(23) Drug All Effective	Process Lead
5.3-17 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	American Heart Association(23) Drug All Effective	Process Lead
5.3-18 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure (HF) who also have left ventricular systolic dysfunction (LVSD) who were prescribed angiotensin-converting enzyme (ACE) inhibitor or angiotensin receptor blocker (ARB) therapy.	American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23) Drug All Effective	Process Lead
5.3-19 Heart failure: percent of patients with left ventricular systolic dysfunction (LVSD) and without both angiotensin converting enzyme inhibitor (ACEI) and angiotensin receptor blocker (ARB) contraindications who are prescribed an ACEI or ARB at hospital discharge.	Centers for Medicare & Medicaid Services(130) Drug Amb/Hosp Effective	Process Lead
5.3-20 Heart failure: percent of patients with ejection fraction less	Veterans Health Administration(53)	

than 40 and a principal discharge diagnosis of heart failure who were on angiotensin-converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) prior to admission (inpatient heart failure antecedent cohort). [NQMC Update Pending]

Drug
Hospital
Effective

Process
Lead

6. Patient Safety

Measures were classified according to the IOM specific areas as described earlier in this document. As measures may fall into more than one category, measures were assigned a primary, secondary and tertiary classification. Specific to the IOM criteria of “Safe,” 123 measures were designated with Safe as their primary classification, 272 as a secondary classification, and 63 as a tertiary classification. It should be noted that these classifications are likely the most subjective. Of the 123 primary measures, measures were excluded that were also categorized as having a pharmacy relevance of “None Identified.” This resulted in a total of 77 measures being identified.

6.1 Patient Safety – IOM “Safe” primary classification:

<u>Specific Category:</u>	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
<u>All</u>		
6.1-1 Hospitalized patients should not receive sedative drugs (e.g. anxiolytics), except if on a ventilator, physiologically dependent on sedatives, or in alcohol withdrawal	RAND Drug Hospital Safe	Process Lead
6.1-2 IF a vulnerable elder is prescribed warfarin, THEN an INR should be determined within 4 days after initiation of therapy and at least every 6 weeks.	ACOVE Quality Indicators Drug Amb/Long Term Care Safe	Process Lead
6.1-3 Percentage of patients ages 65 years and older who received at least one drug to be avoided in the elderly in the measurement year5	NCQA Drug All Safe	Process Lag
6.1-4 Percentage of patients 65 years of age and older who received at least two different drugs to be avoided in the elderly in the measurement year5	NCQA Drug All Safe	Process Lag
6.1-5 IF a vulnerable elder begins receiving and ACE inhibitor, THEN serum potassium and creatinine levels should be checked within 1 week of initiation of therapy.	ACOVE Quality Indicators Monitoring All Safe	Process Lead

6.1-6 ALL vulnerable elders should not be prescribed a medication with strong anticholinergic effects if alternatives are available.	ACOVE Quality Indicators Drug All Safe	Process Lead
6.1-7 Intensive care: percentage of adult patients having had an intensive care unit (ICU) stay whose hospital outcome is death.	Joint Commission on Accreditation of Healthcare Organizations(39) Indirect Hospital Safe	Outcome Lag
6.1-8 IF a vulnerable elder is prescribed a thiazide or loop diuretic, THEN he or she should have electrolytes checked within 1 week of initiating therapy or at least yearly.	ACOVE Quality Indicators Drug Amb/Long Term Care Safe	Process Lead
6.1-9 IF a vulnerable elder requires analgesia, THEN meperidine should not be used.	ACOVE Quality Indicators Drug All Safe	Process Lead
6.1-10 Pressure ulcers: percentage of patients with a pressure ulcer or pressure ulcer risk with documented periodic assessment for specific risk factors.	American Medical Directors Association(64) Indirect Hosp/Long Term Care Safe	Process Lag
6.1-11 Pressure ulcers: percentage of patients with documented assessment of skin for breakdown.	American Medical Directors Association(64) Indirect Hosp/Long Term Care Safe	Process Lead
6.1-12 Pressure ulcers: percentage of patients with documented assessment of risks for possible pressure ulcer development.	American Medical Directors Association(64) Indirect Hosp/Long Term Care Safe	Process Lead
6.1-13 Pressure ulcers: percentage of patients with documented assessment of pressure ulcer using a formal wound staging classification.	American Medical Directors Association(64) Indirect Hosp/Long Term Care Safe	Process Lag
6.1-14 Pressure ulcers: percentage of patients with clinically significant complications.	American Medical Directors Association(64) Indirect Hosp/Long Term Care Safe	Process Lag
6.1-15 Heart failure: percentage of patients monitored for adverse drug reactions.	American Medical Directors Association(64) Follow-up All Safe	Process Lag

6.1-16 Pressure ulcers: percentage of patients in facility who develop pressure ulcers while in the facility.	American Medical Directors Association(64) Indirect Hosp/Long Term Care Safe Outcome Lag
Arthritis and nontraumatic joint disorder	
6.1-17 Patients with a new diagnosis of OA who wish to take medication for joint symptoms should be offered a trial of acetaminophen.	RAND Drug All Safe Process Lead
6.1-18 Hip osteoarthritis: hip replacement mortality rate. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Indirect Hospital Safe Outcome Lag
6.1-19 Post-menopausal women being initiated on HRT should receive counseling about the risks and benefits of HRT within 1 year prior to initiation.	RAND Drug Ambulatory Safe Process Lead
6.1-20 IF oral pharmacologic therapy for osteoarthritis in a vulnerable elder is changed from acetaminophen to a different oral agent, THEN there should be evidence that the patient has had a trial of maximum-dose acetaminophen (suitable for age and comorbid conditions).	ACOVE Quality Indicators Drug All Safe Process Lead
6.1-21 Women with a new diagnosis of menopause should receive counseling about the risks and benefits of HRT within one year of diagnosis.	RAND Patient Counseling Ambulatory Safe Process Lead
6.1-22 IF a vulnerable elder is taking corticosteroids for more than 1 month, THEN the patient should be offered calcium and vitamin D.	ACOVE Quality Indicators Drug All Safe Process Lead
6.1-23 ALL female vulnerable elders should be counseled about estrogen replacement therapy at least once.	ACOVE Quality Indicators Drug All Safe Process Lead
6.1-24 Osteoarthritis: percentage of patient visits during which gastrointestinal (GI) prophylaxis was considered.	American Academy of Orthopaedic Surgeons(7) Drug All Safe Process Lead
6.1-25 IF oral pharmacologic therapy is initiated to treat osteoarthritis in a vulnerable elder, THEN	ACOVE Quality Indicators Drug Process

acetaminophen should be the first drug used, unless there is a documented contraindication to use.	All Safe	Lead
Asthma		
6.1-26 In patients receiving theophylline, if a serum theophylline level exceeds 20 mcg/ml, re-testing of level should be performed within one week, unless theophylline was stopped.	RAND Monitoring All Safe	Process Lead
6.1-27 Patients with moderate-to-severe asthma should not receive beta-blocker medications (e.g. atenolol, propranolol).	RAND Drug All Safe	Process Lead
6.1-28 Patients requiring chronic treatment with systemic corticosteroids during any 12 month period should have been prescribed inhaled corticosteroids during that same time period.	RAND Drug All Safe	Process Lag
6.1-29 Patients on chronic theophylline (dose>600 mg/day for at least 6 months) should have at least one serum theophylline level determination per year.	RAND Drug All Safe	Process Lead
6.1-30 Hospitalized patients should receive systemic steroids (either PO or IV)	RAND Drug Hospital Safe	Process Lag
6.1-31 In patients receiving theophylline, if a serum theophylline level exceeds 20 mcg/ml, the dose should be modified within 1 day of the measurement.	RAND Monitoring All Safe	Process Lead
Cancer		
6.1-32 Men over 60 with minimal prostate cancer (Stage 0/A1) should not be offered any of the following treatments, bilateral orchiectomy, LHRH analogue, and antiandrogen.	RAND Drug All Safe	Process Lead
Coronary Artery Disease (none)		
Diabetes (none)		
Heart Failure		
6.1-32 IF a vulnerable elder has heart failure and left ventricular ejection fraction of 40% or less, THEN he or she should not be treated with a type I antiarrhythmic agent unless an implantable cardioverter-defibrillator is in place.	ACOVE Quality Indicators Drug All Safe	Process Lead

6.1-33 Patients with a diagnosis of heart failure who are on an ACE inhibitor should have their serum creatinine checked every year.	RAND Drug Amb/Long Term Care Safe	Process Lead
6.1-34 Patients with a diagnosis of heart failure who are on an ACE inhibitor should have their serum potassium checked every year.	RAND Monitoring Amb/Long Term Care Safe	Process Lead
6.1-35 Congestive heart failure (CHF): mortality rate. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Indirect All Safe	Outcome Lag
Hypertension		
6.1-36 IF a vulnerable elder has hypertension and asthma, THEN beta-blocker therapy for hypertension should not be used.	ACOVE Quality Indicators Drug All Safe	Process Lead
6.1-37 Sumatriptan and ergotamine should not be given in patients with a history of uncontrolled hypertension.	RAND Drug All Safe	Process Lead
Infectious Disease		
6.1-38 Intensive care: percent of central line-associated primary bloodstream infections (BSIs) by unit of attribution.	Joint Commission on Accreditation of Healthcare Organizations(39) Indirect Hospital Safe	Outcome Lag
6.1-38 Selected infections due to medical care (provider-level): rate per 1,000 discharges. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Monitoring Hospital Safe	Process Lag
6.1-39 Aminoglycosides should not be used, alone or in combination, for antibiotic prophylaxis.	RAND Drug Hospital Safe	Process Lead
6.1-40 Transfusion reaction (provider-level): rate per 1,000 discharges. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Monitoring Hospital Safe	Process Lag

6.1-41 Pneumonia: mortality rate. [NQMC Update Pending]

Agency for Healthcare Research and Quality(115)

Indirect
All
Safe

Outcome
Lag

Ischemic Heart Disease

6.1-42 Patients admitted with acute myocardial infarction should not receive any calcium channel blocker if they have a reduced LVEF ($\leq 40\%$) or heart failure during the hospitalization.

RAND
Drug
Hospital
Safe

Process
Lead

6.1-43 Sumatriptan and ergotamine should not be given in patients with a history of ischemic heart disease or angina.

RAND
Drug
All
Safe

Process
Lead

6.1-44 Acute myocardial infarction: percent of patients who expired during hospital stay.

Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30)

Indirect
Hospital
Safe

Outcome
Lag

Mental Illness

6.1-45 Benzodiazepines: percentage of patients aged 75 years or older with prescription(s) for two or more benzodiazepines or prescriptions for greater than a 30-day supply of medication.

Manitoba Centre for Health Policy(13)
Drug
All
Safe

Outcome
Lag

6.1-46 IF a vulnerable elder presents with symptoms of dementia, THEN the physician should review the patient's medication list for initiation of medications that might correspond chronologically to the onset of dementia symptoms

ACOVE Quality Indicators
Drug
All
Safe

Process
Lead

6.1-47 IF a vulnerable elder is started on an antidepressant medication, THEN the following medications should not be used as first- or second-line therapy: tertiary amine tricyclics, MAOIs (unless atypical depression is present), benzodiazepines, or stimulants (except methylphenidate).

ACOVE Quality Indicators
Drug
All
Safe

Process
Lead

6.1-48 IF a vulnerable elder is taking a serotonin reuptake inhibitor, THEN an MAOI should not be used for at least 2 weeks after termination of paroxetine, sertraline, fluvoxamine, and citalopram, and for at least 5 weeks after termination of fluoxetine.

ACOVE Quality Indicators
Drug
All
Safe

Process
Lead

6.1-49 Anti-anxiety agents should not be prescribed as a sole agent for the treatment of depression.

RAND
Drug
All
Safe

Process
Lead

6.1-50 Medication Overuse (Mental Health Conditions): Use of potentially-inappropriate psychotropic medications by elderly patients	AMCP/NCQA (WHITE PAPER) Drug All Safe Process Lead
Other	
6.1-51 Death in low-mortality Diagnosis-Related Groups (DRGs): in-hospital deaths per 1,000 discharges. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Indirect Hospital Safe Outcome Lag
6.1-52 Transfusion reaction (area-level): rate per 100,000 population. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Monitoring Hospital Safe Process Lag
6.1-53 Gastrointestinal (GI) hemorrhage: mortality rate. [NQMC Update Pending]	Agency for Healthcare Research and Quality(115) Indirect Hospital Safe Outcome Lag
6.1-54 Advanced chronic kidney disease (CKD): percent of patients with phosphorus greater than 4.5 mg/dL.	Renal Physicians Association(35) Monitoring All Safe Process Lag
6.1-55 Patients with atrial fibrillation started on warfarin should have an INR checked within 1 week of the first dose.	RAND Monitoring All Safe Process Lead
6.1-56 Patients diagnosed with BPH who report recent symptoms of prostatism, and who are on anticholinergic or sympathomimetic medications, should have discontinuation or dose reduction of these medications offered or discussed within one month of the note of symptoms.	RAND Drug All Safe Process Lead
6.1-57 IF a vulnerable elder does not need control of seizures, THEN barbiturates should not be used.	ACOVE Quality Indicators Drug All Safe Process Lead
6.1-58 Sumatriptan and ergotamine should not be concurrently administered.	RAND Drug All Safe Process Lead

Pain Management

6.1-59 IF a patient is treated with a COX nonselective NSAID, THEN there should be evidence that the patient was advised of the risk for gastrointestinal bleeding associated with these drugs.	ACOVE Quality Indicators Drug All Safe	Process Lead
6.1-60 Percentage of patients on prescribed or OTC non-steroidal anti-inflammatory drug who were assessed for presence of GI complications and if risk factors were present, medications to reduce the risk of serious GI complications are considered	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Safe	Process Lead
6.1-61 Pain management in the long-term care setting: percentage of patients with orders for not recommended drugs.	American Medical Directors Association(64) Drug Long Term Care Safe	Outcome Lag
6.1-62 Pain management in the long-term care setting: percentage of patients with documented reasons for no medical work-up.	American Medical Directors Association(64) Drug Long Term Care Safe	Process Lag
6.1-63 Percentage of patient visits with an assessment for use of anti-inflammatory or analgesic OTC medications	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug All Safe	Process Lead
6.1-64 Pain management in the long-term care setting: percentage of patients with periodic documented assessment by nursing staff of effectiveness of pain management.	American Medical Directors Association(64) Follow-up Long Term Care Safe	Process Lead
6.1-65 Percentage of patients on prescribed or OTC NSAIDs who were assessed for GI/ Rena; risk factors	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Drug Ambulatory Safe	Process Lead
Peptic Ulcer/Dyspepsia		
6.1-66 Patients presenting with a new episode of dyspepsia should have their presence or absence of NSAID use noted in the medical record on the date of presentation.	RAND Drug Amb/Long Term Care Safe	Process Lag
6.1-67 IF a vulnerable elder is older than 75 years of age, is treated with warfarin, or has a history of peptic ulcer disease or gastrointestinal bleeding, AND is being treated with a COX nonselective NSAID, THEN he or	ACOVE Quality Indicators Drug All Safe	Process Lead

she should be offered concomitant treatment with either misoprostol or a proton-pump inhibitor.

6.1-68 IF a vulnerable elder has been prescribed a COX nonselective NSAID for the treatment of chronic pain, THEN the medical record should indicate whether he or she has a history of peptic ulcer disease and, if a history is present, justification of NSAID use should be documented.

Pregnancy

6.1-69 An oral agent should not be used in diabetic pregnant women.

Preventive Care

6.1-70 Intensive care: number of ventilator days where the patients received stress ulcer disease (SUD) prophylaxis.

6.1-71 IF a hospitalized vulnerable elder is at very high risk for venous thrombosis, THEN the patient should have venous thromboembolism prophylaxis.

6.1-72 Intensive care: number of ventilator days where the patients received deep vein thrombolysis (DVT) prophylaxis.

Surgery

6.1-73 Postoperative sepsis: rate per 1,000 elective surgery discharges. [NQMC Update Pending]

6.1-74 Postoperative wound dehiscence (area-level): rate of reclosure of abdominal wall per 100,000 population. [NQMC Update Pending]

6.1-75 Postoperative wound dehiscence (provider-level): rate of reclosure per 1,000 cases of abdominopelvic surgery. [NQMC Update Pending]

ACOVE Quality Indicators

Drug
All
Safe

Process
Lead

RAND

Drug
Amb/Hosp
Safe

Process
Lead

Joint Commission on Accreditation of Healthcare Organizations(39)

Drug
Hospital
Safe

Process
Lead

ACOVE Quality Indicators

Drug
Hospital
Safe

Process
Lead

Joint Commission on Accreditation of Healthcare Organizations(39)

Drug
Hospital
Safe

Process
Lead

Agency for Healthcare Research and Quality(115)

Monitoring
Hospital
Safe

Outcome
Lag

Agency for Healthcare Research and Quality(115)

Monitoring
Hospital
Safe

Process
Lag

Agency for Healthcare Research and Quality(115)

Monitoring
Hospital
Safe

Outcome
Lag

6.1-76 Persons with hip fractures should be given prophylactic antithrombotics on admission to the hospital.	RAND Drug Hospital Safe	Process Lead
6.1-77 IF a vulnerable elder has valvular or congenital heart disease, an intracardiac valvular prosthesis, hypertrophic cardiomyopathy, mitral valve prolapse with regurgitation, or a previous episode of endocarditis and a high-risk procedure is planned, THEN endocarditis prophylaxis should be given	ACOVE Quality Indicators Drug Hospital Safe	Process Lead

6.2 Patient Safety – IOM “Safe” primary classification specific to elderly patients:

To identify measures specific to patient safety in the population over the age of 65, the database was queried using the terms “65,” “75” (chosen as an indicator from scanning the database records), “elder,” and excluding measures categorized as not having a relevance to pharmacy. Eighteen measures were identified.

<u>Specific Category:</u>	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
All 6.2-1 Percentage of patients ages 65 years and older who received at least one drug to be avoided in the elderly in the measurement year5	NCQA Drug All Safe	Process Lag
6.2-2 Percentage of patients 65 years of age and older who received at least two different drugs to be avoided in the elderly in the measurement year5	NCQA Drug All Safe	Process Lag
6.2-3 Percentage of patients 65 years of age and older who reported discussing their level of exercise or physical activity with a doctor or other health provider in the last 12 months.	Recommended Starter Set Clinical Performance Measures for Ambulatory Care (AQA) Patient Counseling All Patient-Centered	Process Lead

Coronary Artery Disease
(none)

Diabetes
(none)

Hypertension
(none)

Infectious Disease

6.2-4 Non-hospitalized persons > 65 years of age diagnosed with pneumonia without a known bacteriologic etiology and with coexisting illnesses should be offered one of the following oral empiric antibiotic regimens: a second-generation cephalosporin, trimethoprim-sulfamethoxazole, or a beta-lactam/ beta-lactamase inhibitor combination.	RAND Drug Amb/Long Term Care Effective	Process Lead
6.2-5 Influenza immunization: percentage of Medicare members age 65 years and older who received an influenza vaccination from September through December of the year prior to the measurement year.	National Committee for Quality Assurance(38) Drug All Effective	Process Lag
6.2-6 Pneumonia vaccination status: percentage of Medicare members age 65 years and older who ever received a pneumococcal vaccination.	National Committee for Quality Assurance(38) Drug All Effective	Outcome Lag
6.2-7 Immunization, pneumonia: Persons 65 and over who ever received pneumococcal vaccination	National Healthcare Quality Report (NHQR) Drug All Timely	Process Lead
6.2-8 Pneumonia: percent of patients aged 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge if indicated.	Joint Commission on Accreditation of Healthcare Organizations(39) Drug Hospital Timely	Process Lag
6.2-9 Influenza vaccination: percentage of patients aged 65 years or older who received at least one influenza vaccine in the past two years.	Manitoba Centre for Health Policy(13) Drug All Effective	Process Lead
6.2-10 All patients aged 65 and over should have been offered influenza vaccine annually or have documentation that they received it elsewhere.	RAND Drug All Timely	Process Lead
6.2-11 Pneumonia: percent of patients aged 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge, if indicated.	Centers for Medicare & Medicaid Services(130) Drug All Effective	Process Lead

6.2-12 Pneumonia: percent of patients aged 65 and older who were screened for pneumococcal vaccine status and were administered the vaccine prior to discharge if indicated.

Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30)

Drug
All
Effective

Process
Lead

Ischemic Heart Disease

6.2-13 IF a vulnerable elder has atrial fibrillation for more than 48 hours' duration and has any "high-risk" condition: impaired left ventricular function; female older than 75 years of age; hypertension or systolic blood pressure greater than 160 mmHg; or prior ischemic stroke, transient ischemic attack, or systemic embolism, THEN he or she should be offered oral anticoagulant therapy, or antiplatelet therapy if the medical record documents a reason not to give anticoagulant therapy.

ACOVE Quality Indicators

Drug
Hospital
Effective

Process
Lead

Mental Illness

6.2-14 Benzodiazepines: percentage of patients aged 75 years or older with prescription(s) for two or more benzodiazepines or prescriptions for greater than a 30-day supply of medication.

Manitoba Centre for Health Policy(13)

Drug
All
Safe

Outcome
Lag

Other

6.2-15 Management of End Stage Renal Disease: Hemodialysis patients with urea reduction ratio 65% or higher

National Healthcare Quality Report (NHQR)

None Identified
Ambulatory
Efficient

Process
Lead

6.2-16 Patients with atrial fibrillation of greater than 48 hours duration or of unknown duration who do not have contraindications to warfarin should receive warfarin if they are 65 years of age or older.

RAND

Drug
Hospital
Effective

Process
Lead

6.2-17 Patients with atrial fibrillation of greater than 48 hours duration or of unknown duration who do not have contraindications to warfarin should receive warfarin if they are under 65 with one or more other risk factors for stroke.

RAND

Drug
Hospital
Effective

Process
Lead

Peptic Ulcer/Dyspepsia

6.2-18 IF a vulnerable elder is older than 75 years of age, is treated with warfarin, or has a history of peptic ulcer disease or gastrointestinal bleeding, AND is being treated with a COX nonselective NSAID, THEN he or she should be offered concomitant treatment with either misoprostol or a proton-pump inhibitor.

ACOVE Quality Indicators

Drug
All
Safe

Process
Lead

6.3 Patient Safety – Patient Education/Care Plans:

To identify measures related to patient education, the database was queried for measures including the words “plan” or “education.” Forty-five measures were identified.

<u>Specific Category:</u>	<u>Creator</u>	<u>Pharmacy Relevance</u>	<u>Donabedian</u>
<u>All</u>	<u>Care Setting</u>		<u>Lead/Lag</u>
	<u>IOM Aim primary</u>		
6.3-1 Pressure ulcers: percentage of patients with pressure ulcers with documented treatment plan for pressure reduction approaches.	American Medical Directors Association(64)	Indirect Hosp/Long Term Care Effective	Process Lead
6.3-2 Behavioral health care patients' experiences: percentage of adult patients who reported how much of a problem they had getting treatment and information from their health plan or managed behavior health organization.	Agency for Healthcare Research and Quality(115)	Customer Service All Patient-Centered	Outcome Lag
6.3-3 Behavioral health care patients' satisfaction: adult patients' overall rating of their health plan for counseling or treatment.	Agency for Healthcare Research and Quality(115)	Indirect All Patient-Centered	Process Lag
6.3-4 Preventive counseling and education - by topic: the percentage of patients with documentation in their medical records of counseling information given within specific topic areas within the last five years.	Institute for Clinical Systems Improvement(103)	Patient Counseling All Efficient	Process Lead
6.3-5 IF a vulnerable elder is prescribed a new drug, THEN the patient (or, if incapable, a caregiver) should receive education about the purpose of the drug, how to take it, and the expected side effects or important adverse reactions. Pressure ulcers: percentage of patients with pressure ulcers with documented treatment plans citing identified risk factors and co-morbid conditions.	ACOVE Quality Indicators	Patient Counseling All Effective	Process Lead
6.3-6 Pressure ulcers: percentage of patients with pressure ulcers with necrotic tissue or slough with documented treatment plan for wound debridement.	American Medical Directors Association(64)	Indirect Hosp/Long Term Care Effective	Process Lead
6.3-7 Behavioral health care patients' experiences: percentage of adult patients who reported how much of a problem they had getting treatment and information from their health plan or managed	American Medical Directors Association(64)	Indirect Hosp/Long Term Care Effective	Process Lag
	CAHPS Consortium(39)	Follow-up All Patient-Centered	Outcome Lag

behavior health organization.

6.3-8 Behavioral health care patients' satisfaction: adult patients' overall rating of their health plan for counseling or treatment. Harvard Medical School(17)
Customer Service Process
All Lag
Patient-Centered

6.3-9 Behavioral health care patients' experiences: percentage of adult patients who reported how much of a problem they had getting treatment and information from their health plan or managed behavior health organization. Harvard Medical School(17)
Customer Service Process
All Lag
Effective

6.3-10 Behavioral health care patients' satisfaction: adult patients' overall rating of their health plan for counseling or treatment. CAHPS Consortium(39)
Patient Counseling Outcome
All Lag
Patient-Centered

Arthritis and nontraumatic joint disorder

6.3-11 Diagnosis and treatment of adult degenerative joint disease (DJD) of the knee: percentage of patients with DJD with documented education in four comprehensive areas: protecting the joint, exercise, pain relief, healthy living habits. Institute for Clinical Systems Improvement(103)
Indirect Process
All Lead
Effective

Asthma

6.3-12 Diagnosis and outpatient management of asthma: percentage of patients with asthma with education about asthma documented in the medical record. Institute for Clinical Systems Improvement(103)
Follow-up Process
Ambulatory Lead
Efficient

6.3-13 Management plan for people with asthma: Percentage of patients for whom there is documentation that a written asthma management plan was provided either to the patient or the patient's caregiver OR at a minimum, specific written instructions on under what conditions the patient's doctor should be contacted or the patient should go to the emergency room Patient Counseling Process
Ambulatory Lead
Effective

Heart Failure

6.3-14 Heart failure: percent of patients with documentation in the hospital record that left ventricular systolic (LVS) function was evaluated before arrival, during hospitalization, or is planned for after discharge. Joint Commission on Accreditation of Healthcare Organizations(39)
Indirect Process
Amb/Hosp Lead
Effective

6.3-15 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure who were provided with patient education on disease management and health behavior changes during American College of Cardiology(23)
Follow-up Process
Amb/Hosp Lead
Effective

one or more visit(s).

6.3-16 Heart failure: percent of patients discharged home with written instructions or educational material given to patient or care giver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.

Joint Commission on Accreditation of Healthcare Organizations(39)
Patient Counseling Process
Hospital Lead
Patient-Centered

6.3-17 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure who were provided with patient education on disease management and health behavior changes during one or more visit(s).

American Heart Association(23)
Follow-up Process
Amb/Hosp Lead
Effective

6.3-18 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure who were provided with patient education on disease management and health behavior changes during one or more visit(s).

American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23)
Follow-up Process
Amb/Hosp Lead
Effective

6.3-19 IF a vulnerable elder has heart failure and left ventricular ejection fraction of 40% or less, THEN he or she should not be treated with a type I antiarrhythmic agent unless an implantable cardioverter-defibrillator is in place.

ACOVE Quality Indicators
Drug Process
All Lead
Safe

6.3-20 Heart failure: percent of patients with documentation in the hospital record that left ventricular systolic (LVS) function was evaluated before arrival, during hospitalization, or is planned for after discharge.

Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30)
Indirect Process
Hospital Lead
Effective

6.3-21 Heart failure: percent of patients discharged home with written instructions or educational material given to patient or care giver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen.

Centers for Medicare and Medicaid Services/Joint Commission on Accreditation of Healthcare Organizations(30)
Patient Counseling Process
Hospital Lead
Effective

6.3-22 Heart failure: percent of patients discharged home with written instructions or educational material given to patient or care giver at discharge or during the hospital stay addressing all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if

Centers for Medicare & Medicaid Services(130)
Drug Process
Amb/Hosp Lead
Effective

symptoms worsen.

6.3-23 Heart failure: percentage of patients aged greater than or equal to 18 years with diagnosed heart failure who were provided with patient education on disease management and health behavior changes during one or more visit(s).

Physician Consortium for Performance Improvement(53)
Follow-up
All
Effective
Process
Lead

Hypertension

6.3-24 Hypertension: percentage of patient visits during which either systolic blood pressure is greater than or equal to 140 mm Hg or diastolic blood pressure is greater than or equal to 90 mm Hg, with documented plan of care for hypertension.

Physician Consortium for Performance Improvement(53)
Follow-up
All
Effective
Process
Lead

6.3-25 Plan of care: Percentage of patient visits during which either systolic blood pressure >140 mm Hg or diastolic blood pressure > 90 mm Hg, with documented plan of care for hypertension²

AMA/PCPI
Follow-up
All
Effective
Process
Lead

6.3-25 Hypertension diagnosis and treatment: percentage of patients presenting in clinic within the last month for whom patient education about modifiable risk factors has been documented in the medical record.

Institute for Clinical Systems Improvement(103)
Follow-up
Ambulatory
Efficient
Process
Lead

6.3-26 Hypertension: percentage of patient visits during which either systolic blood pressure is greater than or equal to 140 mm Hg or diastolic blood pressure is greater than or equal to 90 mm Hg, with documented plan of care for hypertension.

American Medical Association on behalf of the American College of Cardiology, the American Heart Association, and the Physician Consortium for Performance Improvement(23)
Monitoring
Amb/Hosp
Effective
Process
Lead

6.3-27 Percentage of patient visits during which either systolic blood pressure >140mm Hg or diastolic blood pressure > 90mmHg, with documented plan of care for hypertension.

NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care
Follow-up
Amb/Long Term Care
Effective
Process
Lead

6.3-28 Hypertensive patients with consistent average SBP>140 or DBP>90 over 6 months should have one of the following interventions recorded in the medical record: a change in dose or regimen of antihypertensives, or repeated education regarding lifestyle modifications.

RAND
Monitoring
All
Effective
Process
Lag

6.3-29 Hypertension: percentage of patient visits during which either systolic blood pressure is greater than or equal to 140 mm Hg or diastolic blood pressure is greater than or equal to 90 mm Hg, with documented

American Heart Association(23)
Monitoring
Ambulatory
Effective
Process
Lag

plan of care for hypertension.

6.3-30 Hypertension: percentage of patient visits during which either systolic blood pressure is greater than or equal to 140 mm Hg or diastolic blood pressure is greater than or equal to 90 mm Hg, with documented plan of care for hypertension.

American College of Cardiology(23)
Monitoring
All
Effective
Process
Lag

Infectious Disease

6.3-31 Diagnosis and treatment of otitis media in children: percentage of parents (caretakers) receiving education on the symptoms suggestive of otitis media, appropriate indicators for a provider visit, risk factors, and outcomes of otitis media.

Institute for Clinical Systems
Improvement(103)
Indirect
Ambulatory
Efficient
Process
Lead

6.3-32 Viral upper respiratory infection (VURI) in adults and children: percentage of encounters for cold symptoms (phone care and/or office visits) for which there is documentation that educational messages and/or materials were given.

Institute for Clinical Systems
Improvement(103)
Patient Counseling
All
Effective
Process
Lead

Ischemic Heart Disease

6.3-33 Acute myocardial infarction: percent of patients with documentation of low-density lipoprotein cholesterol (LDL-c) level in the hospital record or documentation that LDL-c testing was done during the hospital stay or is planned for after discharge.

Centers for Medicare & Medicaid
Services(130)
Indirect
Hospital
Efficient
Process
Lead

6.3-34 Acute myocardial infarction: percent of patients with documentation of low-density lipoprotein cholesterol (LDL-c) level in the hospital record or documentation that LDL-c testing was done during the hospital stay or is planned for after discharge.

Centers for Medicare and Medicaid
Services/Joint
Commission on Accreditation of Healthcare
Organizations(30)
Indirect
Hospital
Timely
Process
Lead

6.3-35 Acute myocardial infarction: percent of patients with documentation of low-density lipoprotein cholesterol (LDL-c) level in the hospital record or documentation that LDL-c testing was done during the hospital stay or is planned for after discharge.

Joint Commission on Accreditation of
Healthcare
Organizations(39)
Monitoring
Hospital
Effective
Process
Lead

Other

6.3-36 IF a vulnerable elder presents with a partial-thickness pressure ulcer and has no improvement after 2 weeks of treatment, THEN the appropriateness of the treatment plan should be assessed.

ACOVE Quality Indicators
Indirect
Long Term Care
Effective
Process
Lag

6.3-37 Advanced chronic kidney disease (CKD): percent of patients who have been referred for a transplant evaluation.

Renal Physicians Association(35)
Indirect
All
Outcome
Lag

6.3-38 Advanced chronic kidney disease (CKD): percent of patients with documentation that education was provided.	<p>Effective</p> <p>Renal Physicians Association(35) Patient Counseling Process All Lead Patient-Centered</p>
6.3-39 IF a vulnerable elder presents with a clean full-thickness pressure ulcer and has no improvement after 4 weeks of treatment, THEN the appropriateness of the treatment plan and the presence of cellulitis or osteomyelitis should be assessed.	<p>ACOVE Quality Indicators Indirect Process Hosp/Long Term Care Lag Effective</p>
6.3-40 Diagnosis and management of attention deficit hyperactivity disorder (ADHD) in primary care for school age children and adolescents: percentage of patients diagnosed with ADHD whose medical record contains documentation that the clinician discussed the need for school-based supports and educational service options for children with ADHD.	<p>Institute for Clinical Systems Improvement(103) Indirect Process Ambulatory Lead Effective</p>
6.3-41 Diagnosis and treatment of headache: percentage of migraine sufferers with treatment plans for mild, moderate, and severe headaches.	<p>Institute for Clinical Systems Improvement(103) Indirect Process All Lead Effective</p>
6.3-42 Diagnosis and treatment of headache: percentage of migraine sufferers with documented education.	<p>Institute for Clinical Systems Improvement(103) Indirect Process All Lead Effective</p>
Pain Management	
6.3-43 Pain management in the long-term care setting: percentage of patients with documented care plan for acute or chronic pain.	<p>American Medical Directors Association(64) Follow-up Process Long Term Care Lead Effective</p>
Pregnancy	
6.3-44 Routine prenatal care: percentage of pregnant women who received counseling and education by the 28th week visit.	<p>Institute for Clinical Systems Improvement(103) Patient Counseling Process Amb/Hosp Lead Effective</p>
Surgery	
6.3-45 IF a vulnerable elder has valvular or congenital heart disease, an intracardiac valvular prosthesis, hypertrophic cardiomyopathy, mitral valve prolapse with regurgitation, or a previous episode of	<p>ACOVE Quality Indicators Drug Process Hospital Lead Safe</p>

endocarditis and a high-risk procedure is planned,
THEN endocarditis prophylaxis should be given

7. Generic Efficiency Index and Formulary Management

The goal of this category is to “assure quality of care through cost-effective drug therapy” with a focus on:

1. Number of prescriptions dispensed generically.
2. Therapeutic generic equivalents.

No measures were identified through these methods specific to these categories. This is more likely to be available through the pharmacy industry and industry benchmarks and may be able to be obtained through representatives of the pharmacy industry or possibly the NCPA/Pfizer Digest.

8. Medium-Term Measures

8.1 Prevention and Wellness Programs - Smoking cessation

Twenty-eight measures were identified specific to the category of Smoking Cessation:

Specific Category:
Smoking Cessation

	<u>Creator</u>	<u>Pharmacy Relevance</u>	<u>Care Setting</u>	<u>IOM Aim primary</u>	<u>Donabedian Lead/Lag</u>
8.1-1 Adult smoking cessation advice/counseling	Hospital Quality Alliance (HQA)	Patient Counseling	All	Effective	Process Lead
8.1-2 Tobacco use prevention and cessation for adults and mature adolescents: percentage of patients' charts that either show that there is no tobacco use/exposure or (if a user) that the current use was documented at the most recent clinician visit.	Institute for Clinical Systems Improvement(103)	Patient Counseling	All	Effective	Process Lead
8.1-3 Tobacco use prevention and cessation for infants, children and adolescents: percentage of patients with documented tobacco use or exposure at the latest visit who also have documentation that their cessation interest was assessed or that they received advice to quit.	Institute for Clinical Systems Improvement(103)	Patient Counseling	All	Effective	Process Lead
8.1-4 Tobacco use prevention and cessation for infants, children and adolescents: percentage of patients' charts showing either that there is no tobacco use/exposure or (if a user) that the current use was documented at the most recent clinician visit.	Institute for Clinical Systems Improvement(103)	Patient Counseling	All	Effective	Process Lead
8.1-5 Pneumonia: percent of patients with a history of smoking cigarettes who are given smoking cessation advice or counseling during hospital stay.	Joint Commission on Accreditation of Healthcare Organizations(39)	Patient Counseling			Process

	Hospital Efficient	Lead
8.1-6 Smoking cessation: percentage of members who were either current smokers or recent quitters and who received advice to quit smoking.	National Committee for Quality Assurance(38) Follow-up All Effective	Process Lead
8.1-7 Preventive care and screening: percentage of patients identified as tobacco users who received cessation intervention during the two-year measurement period.	Physician Consortium for Performance Improvement(53)	
8.1-8 Preventive care and screening: percentage of patients who were queried about tobacco use one or more times during the two-year measurement period.	Physician Consortium for Performance Improvement(53)	
8.1-9 Tobacco cessation: percent of patients using tobacco any time during the past 12 months (NEXUS mental health subgroup cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Effective	Process Lead
8.1-10 Tobacco cessation: percent of patients using tobacco any time during the past 12 months (NEXUS non-mental health subgroup cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Effective	Process Lead
8.1-11 Tobacco cessation: percent of patients using tobacco any time during the past 12 months (spinal cord injury & disorder [SCI&D] cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Effective	Process Lead
8.1-12 Tobacco cessation: percent of patients using tobacco who have been counseled three times in twelve months to cease tobacco use (NEXUS clinics mental health subgroup cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Effective	Process Lead
8.1-13 Tobacco use prevention and cessation for adults and mature adolescents: percentage of patients with documented tobacco use or exposure at the latest visit who also have documentation that their cessation interest was assessed or that they received advice to quit.	Institute for Clinical Systems Improvement(103) Patient Counseling All Effective	Process Lead
8.1-14 Tobacco cessation: percent of patients using tobacco who have been counseled three times in twelve months to cease tobacco use (spinal cord injury & disorder [SCI&D] cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Effective	Process Lead
8.1-15 Pneumonia: percent of patients with a history of smoking cigarettes who are given smoking cessation	Centers for Medicare & Medicaid Services(130)	

advice or counseling during hospital stay.	Follow-up Hospital Effective	Outcome Lead
8.1-16 Adult smoking cessation advice/counseling	Hospital Quality Alliance (HQA) Follow-up Hospital Timely	Process Lead
8.1-17 Percentage of patients who were queried about tobacco use one or more times during the two-year measurement period.	Ambulatory Care Quality Alliance (AQA) Follow-up Ambulatory Efficient	Process Lead
8.1-18 Percentage of patients who received advice to quit smoking.	Ambulatory Care Quality Alliance (AQA) Follow-up Ambulatory Timely	Process Lead
8.1-19 Counseling on risk factors: Current smokers age 18 and over receiving advice to quit smoking	National Healthcare Quality Report (NHQR) Follow-up All Effective	Process Lead
8.1-20 Tobacco use prevention for infants, children and adolescents: Percentage of patients' charts showing either that there is no tobacco use/exposure or (if a user) that the current use was documented at the most recent clinic visit ³ b. Tobacco use cessation for infants, children and adolescents: Percentage of patients with documented tobacco use or exposure at the latest visit who also have documentation that their cessation interest was assessed or that they received advice to quit ³	Patient Counseling All Effective	Process Lead
8.1-21 Advising smokers to quit:: Percentage of patients who received advice to quit smoking, b. Discussing smoking cessation medications: Percentage of patients whose practitioner recommended or discussed smoking cessation medications, c.	Patient Counseling All Effective	Process Lead
8.1-22 Discussing smoking cessation strategies: Percentage of patients whose practitioner recommended or discussed smoking cessation methods or strategies		
8.1-23 Percentage of smokers who were recommended or offered an intervention for smoking cessation (ie counseling or pharmacologic therapy)	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Follow-up All Effective	Process Lead

8.1-24 Percentage of patients whose practitioner recommended or discussed smoking cessation medications	NQF-Endorsed National Voluntary Consensus Standards for Physician-Focused Ambulatory Care Patient Counseling All Effective	Process Lead
8.1-25 All smokers attempting to quite who smoke more than 10 cigarettes a day should be offered pharmacotherapy except in the presence of serious medical precautions.	RAND Drug All Effective	Process Lead
8.1-26 Preventive care and screening: percentage of patients identified as tobacco users who received cessation intervention during the two-year measurement period.	American Medical Association on behalf of the Physician Consortium for Performance Improvement(23) Follow-up All Effective	Process Lag
8.1-27 Preventive care and screening: percentage of patients who were queried about tobacco use one or more times during the two-year measurement period.	American Medical Association on behalf of the Physician Consortium for Performance Improvement(23) Follow-up All Effective	Process Lead
8.1-28 Tobacco cessation: percent of patients using tobacco who have been counseled three times in twelve months to cease tobacco use (NEXUS non-mental health subgroup cohort). [NQMC Update Pending]	Veterans Health Administration(53) Follow-up All Effective	Process Lead

8.2 Prevention and Wellness Programs - Vaccinations

Twenty-eight measures were identified specific to Immunizations/Vaccinations

<u>Specific Category:</u>	<u>Creator</u>	<u>Pharmacy Relevance</u>	<u>Care Setting</u>	<u>IOM Aim primary</u>	<u>Donabedian Lead/Lag</u>
Diabetes					
8.2-1 Adult diabetes: percentage of eligible patients who received an immunization or refused immunization during the calendar period.	National Diabetes Quality Improvement Alliance(20)	Drug	All	Effective	Process Lead
8.2-2 Adult diabetes: percentage of patients who received an influenza immunization during the recommended calendar period.	National Diabetes Quality Improvement Alliance(20)	Drug	All	Effective	Process Lead

Infectious Disease

- | | | |
|--|---|-----------------|
| 8.2-3 Childhood immunizations (partial coverage): percent of enrolled children who received all of the following by the measure end date: three DTaP, DT, or DTP with different dates of service, or some combination of DTaP, DTP or DTP/DT vaccines adding up to 3 doses, three polio (IPV/OPV) vaccinations with different dates of service, one measles vaccination, one mumps vaccination, one rubella vaccination or one MMR vaccination, two H influenza type B (Hib) vaccinations, two hepatitis B vaccinations (MEDDIC-MS). [NQMC Update Pending] | State of Wisconsin, Department of Health and Family Services(44)
Drug
Ambulatory
Effective | Process
Lead |
| 8.2-4 Immunizations: percentage of two-year-olds who are up-to-date with their primary series of immunizations (DTaP, IPV, MMR, PCV7, VZV, Hib, Hep B). | Institute for Clinical Systems Improvement(103)
Drug
Ambulatory
Effective | Process
Lead |
| 8.2-5 Immunizations: percentage of young adults who are up-to-date with Hepatitis B (Hep B). | Institute for Clinical Systems Improvement(103)
Drug
Ambulatory
Effective | Process
Lead |
| 8.2-6 Preventive services for children and adolescents: percentage of patients who are up-to-date with recommended immunizations. | Institute for Clinical Systems Improvement(103)
Drug
Ambulatory
Effective | Process
Lead |
| 8.2-7 Childhood immunization: percentage of patients who received their primary course of immunizations (i.e., DPT-HiB, polio x4, and MMR) by age 24 months. | Manitoba Centre for Health Policy(13)
Drug
Ambulatory
Timely | Process
Lead |
| 8.2-8 Influenza vaccination: percentage of patients aged 65 years or older who received at least one influenza vaccine in the past two years. | Manitoba Centre for Health Policy(13)
Drug
All
Effective | Process
Lead |
| 8.2-9 Adolescent immunization status: percentage of adolescents who had a second dose of MMR, three hepatitis B and one chicken pox vaccination by their 13th birthday (Combination #2). | National Committee for Quality Assurance(38)
Drug
Ambulatory
Effective | Process
Lead |
| 8.2-10 Influenza immunization: percentage of commercial members ages 50-64 who received an influenza vaccination since September 1 of the measurement year. | National Committee for Quality Assurance(38)
Drug
All | Process
Lead |

8.2-11 Influenza immunization: percentage of Medicare members age 65 years and older who received an influenza vaccination from September through December of the year prior to the measurement year.	<p>Effective National Committee for Quality Assurance(38) Drug All Effective</p> <p>Process Lag</p>
8.2-12 Immunizations: percentage of adolescents who are up-to-date with recommended immunizations (Hep B, MMR, tetanus, and verification of varicella immunity).	<p>Institute for Clinical Systems Improvement(103) Drug Ambulatory Effective</p> <p>Process Lead</p>
8.2-13 Childhood immunizations (full coverage): percent of enrolled children who received all of the following by the measure end date: four DTaP, DT, or DTP with different dates of service, or some combination of DTaP, DTP or DTP/DT vaccines adding up to 4 doses, three polio (IPV/OPV) vaccinations with different dates of service, one measles vaccination, one mumps vaccination, one rubella vaccination or one MMR vaccination, one varicella (VZV) vaccination, three H influenza type B (Hib) vaccinations, three hepatitis B vaccinations (MEDDIC-MS). [NQMC Update Pending]	<p>State of Wisconsin, Department of Health and Family Services(44) Drug Ambulatory Timely</p> <p>Process Lead</p>
8.2-14 Pneumonia: percent of patients age 50 years and older, hospitalized during October, November, December, January, or February who were screened for influenza vaccine status and were vaccinated prior to discharge, if indicated.	<p>Centers for Medicare & Medicaid Services(130) Drug All Effective</p> <p>Process Lead</p>
8.2-15 Influenza immunization: percent of applicable patients receiving influenza immunizations between September 1, 2004 and January 31, 2005 (NEXUS clinics cohort). [NQMC Update Pending]	<p>Veterans Health Administration(53) Follow-up All Timely</p> <p>Process Lead</p>
8.2-16 Influenza immunization: percent of applicable patients receiving influenza immunizations between September 1, 2004 and January 31, 2005 (spinal cord injury & disorder [SCI&D] cohort). [NQMC Update Pending]	<p>Veterans Health Administration(53) Follow-up All Timely</p> <p>Process Lead</p>
8.2-17 Pneumococcal pneumonia: percent of applicable patients receiving pneumococcal immunization (spinal cord injury & disorder [SCI&D] cohort). [NQMC Update Pending]	<p>Veterans Health Administration(53) Drug All Timely</p> <p>Process Lead</p>
8.2-18 Percentage of patients [50-64] who received an influenza vaccination.	<p>Ambulatory Care Quality Alliance (AQA) Drug Ambulatory Timely</p> <p>Process Lead</p>

8.2-19 Percentage of patients who ever received a pneumococcal vaccine.	Ambulatory Care Quality Alliance (AQA) Drug Ambulatory Timely	Process Lag
8.2-20 Immunization, childhood: Infant mortality per 1,000 live births, by birth weight	National Healthcare Quality Report (NHQR) Indirect Amb/Hosp Effective	Process Lag
8.2-21 Immunization, pneumonia: Persons 65 and over who ever received pneumococcal vaccination	National Healthcare Quality Report (NHQR) Drug All Timely	Process Lead
8.2-22 All patients aged 65 and over should have been offered influenza vaccine annually or have documentation that they received it elsewhere.	RAND Drug All Timely	Process Lead
8.2-23 All patients under age 65 with any of the following conditions should have been offered influenza vaccination annually: living in a nursing home, chronic obstructive pulmonary disease, chronic cardiovascular disorders, renal failure, immunosuppression, diabetes mellitus, hemoglobinopathies (e.g., sickle cell).	RAND Drug All Effective	Process Lead
8.2-24 There should be documentation that all patients aged 65 and older presenting for care were offered pneumococcal vaccine at least once.	RAND Drug All Effective	Process Lead
8.2-25 There should be documentation that all patients in the following groups and otherwise presenting for care were offered pneumococcal vaccine at least once: chronic cardiac or pulmonary disease, diabetes mellitus, anatomic asplenia, and persons over age 50 who are institutionalized.	RAND Drug All Effective	Process Lead
8.2-26 Pregnant women not immune to rubella should postpartum immunization within 6 weeks.	RAND Drug Amb/Hosp Effective	Process Lead
8.2-27 Preventive care and screening: percentage of patients who received an influenza immunization during the one-year measurement period.	Physician Consortium for Performance Improvement(53)	
Preventive Care		
8.2-28 Childhood immunization status: percentage of children who had four DTaP/DT, three IPV, one MMR, three haemophilus influenza type B, three hepatitis B	National Committee for Quality Assurance(38) Drug	Outcome

and one chicken pox vaccination by the child's second birthday (Combination #2).

Ambulatory
Effective

Lag

9. Gap Analysis

As quality measurement is in its relative infancy, many gaps exist from what would be considered an ideal quality measurement environment. The previously referenced report by the IOM: *Performance Measurement: Accelerating Quality*⁵ outlines key areas of measurement that are missing. These include:

Narrow time window. In general, most performance measures assess care at only one point in time.

Provider-centric focus. Current measures tend to focus on specific settings of care, so that measure specifications are applicable to only one setting, such as a physician office or hospital. The committee recommends moving toward individual patient-level measurement, even for the starter set of measures, because of the markedly increased value and flexibility offered by this approach.

Narrow focus of accountability. The committee (IOM Committee on Redesigning Health Insurance Performance Measures, Payment, and Performance Improvement Programs, Board on Health Care Services) endorses the principle of shared accountability among all providers involved in a patient's care. This strategy represents perhaps the most significant explicit departure from a traditional guideline for selecting performance measures—that a responsible entity or person be known at the outset.

Composite Measures - denoting, at minimum, the combining of dichotomous indicators for several specific measures into a single number, documenting, for example, whether a patient received all of his or her recommended preventive services within a specified time window.

Challenges: The technical challenges to the construction of accurate, valid, and reliable composite measures and their elements for all conditions are substantial. Among these challenges are the following:

- The rate automatically tends to go down as more process measures are added to the composite, since it is more difficult to provide all the require measures of a large set than of a small one.
- Improvement will not be fully reflected by composites if several processes are measured, some of which are received at a high rate and others at a generally low rate.

9.1 Gap Analysis – Identified Areas Lacking Developed Measures for Pharmacists/Pharmacies

Generic Utilization – As mentioned in Section 7 above, no measures were identified that measure generic utilization. This is not surprising as this area is highly pharmacy-specific. . These measures may be available through the pharmacy industry (e.g. chain pharmacies, industry tracking companies (IMS)), industry associations, managed care companies, PBMs, or possibly the NCPA/Pfizer Digest.

Pharmacist Interventions – Relatively little work has been done to measure the value that pharmacists deliver in the current delivery model, yet it is known to exist. Appendix A is a

⁵ Committee on Redesigning Health Insurance Performance Measures, Payment, and Performance Improvement Programs, Board on Health Care Services, *Performance Measurement: Accelerating Improvement*, Institute of Medicine of the National Academies, National Academies Press, 2006.

summary of the evidence of the value pharmacists provide. Additionally, the Iowa Pharmaceutical Case Management Program Final Report (link: <http://www.iarx.org/Documents/PCM%20Final%20Report.pdf>) is an evaluation of pharmacist services delivered through the Iowa Medicaid program. Other states with payment programs for pharmacists' care/medication therapy management services include (at a minimum), Florida, Minnesota, Missouri, New Mexico, North Carolina, and Wisconsin. Experiences in these states may be useful in identifying measures for pharmacist/pharmacy performance in the delivery of care to patients. Appendix B is a summary of a Medline literature search using the terms "Pharmacy," "Quality," and "Measures." Three hundred seventy (370) articles were identified using these terms with 81 included in the appendix as having relevance to establishing metrics on pharmacy performance.

Adverse Drug Events/Identification and Resolution of Drug Therapy Problems – Since the early 1990's, the profession of pharmacy has recognized the need for pharmacists' work to focus on identifying and resolving drug therapy problems⁶. The significance of problems related to the inappropriate use of medications has been well documented and was especially highlighted in the Institute of Medicine Report – *To Err Is Human*⁷. Many of the existing measures may be used to help prevent or measure the occurrence of drug therapy problems. Still, these do not entirely measure the quality of the pharmacist/pharmacy care provided. While likely not in existence today, fully measuring quality in pharmacist/pharmacy care will include measuring care when no medication is dispensed, especially in the situation where a pharmacist determines that a medication is not safe or not indicated and the medication is not dispensed.

Adherence/Persistence – Few measures were identified specific to adherence/persistence. This is likely due to the three factors: 1. With the development of quality measures is still fairly new, measurement has initially focused on easier targets (e.g. medications being "prescribed," or "offered"). 2. Difficulty in measuring due to the inability to truly know if a patient has actually taken the medication, especially in ambulatory settings. 3. Lack of measurement on pharmacists/pharmacies. This area is highly-related to pharmacists/pharmacies. Increased measurement of pharmacists/pharmacies should lead to measure development in this area. Appendix C is a summary of a Medline literature search using the terms "adherence," "persistence," and "medications." Forty-six (46) articles were identified using these terms with 43 included in the appendix as having relevance to adherence/persistence with medication use.

Health Literacy – Health literacy is a major public health area and is an objective of Healthy People 2010. While many interventions were identified specific to patient education however the measurement currently stops at whether or not the patient received education or a plan was established. No interventions were identified that measured the extent that the education was understood by the patient.

⁶ Hepler CD, Strand LM. Opportunities and responsibilities in pharmaceutical care. *Am J Hosp Pharm.*1990;47:533-43.

⁷ Institute of Medicine. *To Err Is Human: Building a Safer Health System*. National Academy Press, Washington, DC, 2000.

Patient Safety – While many patient safety measures have been identified or at least categorized, few, if any, measures are specific to the product fulfillment process. Two tools that may be of use to improve quality are the

1. ISMP – Institute for Safe Medication Practices Self Assessment Tools for Community/Ambulatory and Hospital practices and 2. PQC – Pharmacy Quality Commitment quality assurance program of the National Alliance of State Pharmacy Associations.

Medication Therapy Management (MTM) – While many measures are related to medication and can serve to measure the results of MTM services, establishment of process measures (and possibly even structural measures at the early stages of MTM service development) similar to existing measures of whether or not a medication or service was “prescribed” or “offered” could serve as lead indicators to increase implementation.

Pharmacist-specific measures – No measures were identified that were specific only to pharmacists or pharmacies. Measures generally use the term “provider” and do not single out the type of provider. While it is likely that structure and process measures specific to pharmacists/pharmacies will help produce quality outcomes, pharmacists/pharmacies should also be able to fit within current measures focused on achieving quality outcomes with the patient. This would fit within the previously referenced IOM report and the work of Porter and Teisburg that both support measurement based on results and across the full cycle of care.

9.2. Gap Analysis – Areas Identified with Existing Measures But Not Included in Initial Starter Set

As represented in Figure 1 on page 10 of this document, many measures were identified outside of the initial starter set of measures currently being considered by the PQA. Additional areas that are included in the database of measures that the PQA may want to consider include:

- Arthritis
- HIV
- Infectious Disease
- Ischemic Heart Disease
- Mental Illness
- Patient-Centered
 - Patient Satisfaction
 - Customer Service
- Pain Management

Limitations:

While this report is believed to be an extensive environmental scan of the quality measures existing in today’s healthcare environment, the categorization of measures is meant to provide a starting point from which the Pharmacy Quality Alliance members can make informed decisions. The following limitations are noted:

- The environmental scan and categorization of measures were performed by one individual. Therefore, it is expected that some categorizations may not meet the consensus of a group. This initial pass is intended to serve as a starting point for categorizations to facilitate the work of the PQA.
- The time allowed and the number of measures identified combined to only allow for a one-time review of the measures. Therefore there are likely inconsistencies across some measure categorizations.
- Not all measures are distinct. Measures were included from many sources. Some of these sources were duplicative of each other. Measures will still included to show additional supportive groups/organizations for the measures.
- It was identified during the review process that an additional category would have been beneficial. In addition to the “Specific Category” field, a field that would separately allow for categorization by drug would have been useful. The process used, absent of that field, resulted in some “dual-use” of the “Specific Category” field.

Additional Information:

Because of the similarity of the work of the PQA with the IOM Committee, the IOM Report: *Performance Measurement: Accelerating Quality* is highly recommended. Two pieces of that report, the committee’s criteria for measure selection and recommended starter set of measures are included as Appendices C and D, respectively.

Two additional sources of reference have been identified that have been included as Appendices E and F. Appendix E is a summary of measures identified by the Association of Managed Care Pharmacy (AMCP) and National Committee for Quality Assurance (NCQA) on quality measurement for Medicare Part D plans.⁸ Appendix F includes Tables from an upcoming book chapter “Performance Measurement in the Medication Use System⁹”

⁸ AMCP/NCQA Developing a Robust Quality Measurement Approach for Medicare Part D, White Paper, May 2006.

⁹ Safe and Effective? MacKinnon NJ, ed. Canadian Pharmacists Association, Ottawa,ON; in production (to be published Jan 2007).

Appendix A

Evidence of the Value of Pharmacists

APhA has created several summaries of the most respected scientific and clinical literature establishing the documented human and financial cost of drug therapy misadventures, the need for improved pharmaceutical care services, and the documented clinical and economic impact of pharmacists who have taken on the job of providing pharmaceutical care. These summaries of the published literature are presented in lay language that should be accessible to policy makers and news media interested in the problem of morbidity and mortality associated with poorly managed drug therapy. Studies addressing the value of pharmacists are organized by disease state and one preventive care category, immunizations. Please feel free to print and reorganize these summaries to substantiate your assertions about the value of pharmaceutical care when you have conversations with payors, employers, news media, and others. Be mindful that rewording these summaries without reading the original articles can put you at risk of misrepresenting the researchers' findings!

Adverse Drug Events

In a recent study, pharmacist participation in the intensive care unit at the time of drug prescribing was shown to lower the rate of adverse drug events (ADE). Conducted during two time periods at the Massachusetts General Hospital, the study revealed that the rate of preventable ordering ADEs decreased by 66%, and 99% of pharmacist recommendations were accepted by physicians. - (Leape LL, Cullen DJ, et al. Pharmacist Participation on Physician Rounds and Adverse Drug Events in the Intensive Care Unit. *JAMA*. 1999; 282(3):267-270.)

ADEs occurred in 2.4% of patients in a large hospital. ADEs were associated with an increased length of stay of 1.9 days, and an almost 2-fold increased risk of death. Cost increased by \$2262 per event. - (Classon DC, et al. Adverse drug events in hospitalized patients. Excess length of stay, extra costs, and attributable mortality. *JAMA*. 1997; 277(4):301-6.)

In a recent study of two tertiary-care hospitals over a six-month period, 60 of 190 adverse drug events (ADE) were determined to be preventable. Based on these events and the increased costs associated with them, the estimated annual costs attributable to all ADEs and preventable ADEs for a 700-bed teaching hospital are \$5.6 million and \$2.8 million respectively. - (Bates DW, Spell N, et al. The costs of adverse drug events in hospitalized patients. *JAMA*. 1997; 277(4):307-11.)

"Incorrect choice of drug" and "drug side effects" ranked 9th and 10th most costly categories of malpractice litigation for the nation's largest malpractice carrier in 1996. Average claims cost, respectively, \$99,300 and \$86,400. "Drug side effect" was also the sixth most common allegation. - (Physician & Surgeons Year-End Update, St. Paul Medical Services, Dec. 1996.)

Medication misadventures caused 1.7% of an HMO's emergency department visits and 1% of admissions during a 12-month period. Less than 1/3 of these patients understood the potential adverse effects of their drug therapy. Adverse effects and inappropriate dosage accounted for most problems among the elderly. - (Schneitman-McIntire O, Farnen TA, et al. Medication misadventures resulting in emergency department visits at an HMO medical center. *Am J Health-Syst Pharm*. 1996; 53:1416-22.)

Drug related illnesses accounted for 4% of emergency department visits during one month at a large teaching hospital; two-thirds were judged preventable. Noncompliance caused 58%, adverse effects 32%, and inappropriate prescribing 10% of these visits. Preventable drug-related illnesses cost about \$678 per

patient, \$390,000/year at the facility. - (Dennehy CE, Kishi DT and Louie C. Drug-related illness in emergency department patients. *Am J Health-Syst Pharm.* 1996; 53:1422-6.)

The average cost of treating reported adverse drug events occurring among inpatients was \$783 at a university-affiliated hospital in 1994 (a total of \$1.5 million/year at this facility). Seventeen percent of these reported adverse events were judged preventable. - (Schneider PJ, Gift MG, *et al.* Cost of medication-related problems at a university hospital. *Am J Health-Syst Pharm.* 1995;52:2415-8.)

Inadequate drug therapy costs \$77 billion/year in the U.S.- (Johnson JA, Bootman JL. Drug-related morbidity and mortality: a cost of illness model. *Arch Intern Med.* 1995; 155:1949-56.)

An analysis of 1992 Medicare data found about 5.25 million noninstitutionalized Medicare enrollees used at least one drug identified as generally unsuitable for elderly patients given that safer drugs exist. -- (U.S GAO. Prescription Drugs and the Elderly: Many still receive potentially harmful drugs despite recent improvements. GAO/PEMD-95-14. July 1995.)

Adverse drug events (ADEs) occurred at a rate of 6.5 per 100 nonobstetrical inpatients at two hospitals during a six months in 1993 (1900 adverse events per hospital/year). 28% of ADEs (42% of "life-threatening" or "serious" ADEs) were judged preventable. 56% of errors occurred in ordering, 34% in administration, 6% in transcribing orders, 4% in dispensing. Most common cause of preventable errors was "lack of knowledge of the drug," (22% of errors), followed by "lack of information about the patient" (14% of errors). - (Bates DW, *et al.* Incidence of adverse drug events and potential adverse drug events: implications for prevention. *JAMA.* July 1995; 274: 29-34.)

A study of paid malpractice claims by twenty physician-owned malpractice insurers found medication related claims were the second most common category of claims and resulted in an average payment of \$99,721. The four most common errors (accounting for 37% of all errors) found were "incorrect or inappropriate dosage," "inappropriate medication for medical condition", "failure to monitor for side effects" and "communication failure between physician and patient." -- (The Physician Insurers Association of America, Medication Error Study, June 1993.)

Of elderly patients taking three or more chronic prescription drugs, over one-third are re-hospitalized within six months of discharge; 28% of readmissions are due to drug problems: undertreatment, noncompliance, and adverse drug reactions. -- (*Medical Care*, October 1991.)

Adverse drug events rank fifth among the top preventable threats to the health of elderly Americans, after Congestive Heart Failure, Breast Cancer, Hypertension, Pneumonia. - (Fine A, & Park RE. Assuring the Quality of Health Care for Older Persons. *JAMA* 1987;258:1905-8.)

32,000 senior citizens each year suffer hip fractures from falls caused by adverse drug events. -- (*New England Journal of Medicine*, February 1987.)

Asthma

The Problem

Asthma is a complex disease that presents a significant challenge to health care delivery in the United States. Asthma morbidity and mortality has steadily increased over the past 15 years despite readily available and effective medications. Each year, about 454,000 people are hospitalized and nearly 4,000 people die of asthma. An estimated 10 million Americans have asthma. The cost of illness related to asthma in 1990 is estimated to be \$6.2 billion. (Im JH, Evaluation of the effectiveness of an asthma clinic managed by an ambulatory care pharmacist *Calif J Hosp Pharm.* 1993::5;5-6)

Pharmacists coordinated an asthma management program to reduce emergency department visits. A significant reduction in emergency room visits occurred for the participating patients. A total of 92 visits to the emergency department occurred for the 25 enrolled patients during a six month period one year prior to enrolling in the program. During the study, the total number of emergency visits dropped to 6 for the analogous six month period. (Pauley TR, Magee MJ & Cury JD. Pharmacist-managed physician-directed asthma management program reduces emergency department visits. *Am Pharmacothe* 1995;29;5-9)

African-Americans suffer greater morbidity and mortality due to asthma than Caucasians. African-American asthmatics participated in a study to determine if a pharmacist-managed long-term asthma management program would improve outcomes. Upon enrollment in the program and with each subsequent visit, each patient received asthma education from one of the staff pharmacists. There was a 91% reduction in ER visits in the first year of the study and an 83% reduction in the second year. There was also a reduction of 83% in hospitalizations after the first and second years, and 62% of patients enrolled in the program had total elimination of the need for institutional acute care management. (Kelso TM, Abou-shala N, et.al. Comprehensive Long-term Management Program for Asthma: Effect on Outcomes in Adult African-Americans *Am J Med Sci* 1996;311(6);272-280).

Pharmacists evaluated the economic impact of patient-focused pharmacist intervention in the community retail setting in patients with asthma and three other disease states. Specially trained pharmacists intervened by providing targeted patient education, performing systematic patient monitoring, offering feedback and behavior modification and communicating regularly with patients' physicians. Although the average cost per prescription was higher for patients receiving pharmacist intervention, the overall health care costs were lower, as much as \$200 per patient per month. (Munroe WP, Kunz K et.al. Economic Evaluation of Pharmacist Involvement in Disease Management in a Community Pharmacy Setting. *Clin Ther* 1997;19(1);113-23)

Diabetes

Pharmacists Improve Health Outcomes and Cut the Cost of Providing Diabetic Health Care

The Need:

Diabetic patients suffer disproportionately from adverse drug events requiring hospitalization. These mishaps often result from preventable improper use, overuse, and underuse of diabetic drug therapy. *Am J Health-syst Pharmacy*, June 15, 1996; Lakashmann et al, *Arch Internal Medicine*, October 1986.

Eighty-six percent of patients receiving care from pharmacists hired by the City of Asheville, NC, were highly satisfied with their care. Patients reported a higher quality of life and greater ability to function. Interaction with diabetes educators increased while payer cost for services decreased. Initial data from Asheville suggests the city has saved an estimated \$14,000 over the first six months of the program. The total cost of inpatient and outpatient services declined \$20,246 during the 12-month treatment period. ("The Asheville Project," *Pharmacy Times*, supplement issue. Romaine Pierson Publishers, Inc. Westbury, NY, October 1998.)

Community pharmacy. Pharmacists in three pharmacies provided a disease management program for patients with hypertension, diabetes, asthma, and/or hypercholesterolemia. Experimental group patients received pharmacist-directed education and management; control group patients received traditional services. Results: Higher average **drug** cost for the intervention group, but net savings of

\$144-\$294 per patient in **total medical** costs, adjusted for disease severity, comorbid conditions, and age. Pharmacist monitoring of blood pressure, cholesterol, glucose, peak flow rate allowed early warnings to physicians of adverse effects, suboptimal control of the disease, and poor adherence to therapy. (Munroe WP, et al. Economic Evaluation of Pharmacist Involvement in Disease Management in a Community Pharmacy Setting. Clin Ther. 1997;19(1):113-123.)

Long Term Care Facility. A pharmacist who had been granted the authority to change the drug therapy of diabetic patients significantly improved control of blood sugar, compared to the same pharmacist's activities in a control facility where the pharmacist was empowered only to make recommendations for drug therapy. (Cooper JW. Consultant Pharmacist Contribution to Diabetes Mellitus Patient Outcomes in Two Nursing Facilities. Cons Pharm. 1995;10(1):40-45.)

Ambulatory Managed Care Clinic. Pharmacists reviewed drug therapy for a population including diabetic patients, finding problems with nearly 65% of drug regimens. Drug therapy changes based on the pharmacists' recommendations reduced unscheduled hospital visits, urgent care visits, emergency room visits, and hospital days, saving over \$640 a year in health costs per individual (\$280,000/year per pharmacist). The bulk of these savings "were in the nonpharmacy sector: fewer unscheduled physician visits and fewer hospital days." (Borgsdorf LR, Miano JS, Knapp KK. Pharmacist-Managed Medication Review in a Managed Care System. *Am J Hosp Pharm* 1994;51:772-7.)

Ambulatory Care. Pharmacist-to-patient teaching was effective in improving the quality of both the process and outcomes of care. Experimental group patients were significantly more compliant in keeping clinic appointments; experienced fewer medication errors; had improved symptoms for five of eight symptoms monitored; required fewer changes in therapy; had fewer hospital admissions and fewer medical contacts. Pharmacists spent 2.3 times as much time working with experimental group patients as control patients. Randomized controlled study. (Sczupak CA, Conrad WF. Relationship Between Patient-Oriented Pharmaceutical Services and Therapeutic Outcomes of Ambulatory Patients with Diabetes Mellitus. *Am J Hosp Pharm*. 1977;34:1238-1242.)

Drug Therapy Compliance

Patient compliance with drug therapy deteriorates as the number of drugs taken by the patient increases. Because 25% of the elderly use three or more drugs daily, the elderly are particularly at risk. - (Lipton HL, Bird JA. The impact of clinical pharmacists' consultations on geriatric patients' compliance and medical care use: a randomized controlled trial. *Gerontologist*. 1994; 34:307-15)

Twenty-eight percent of hospitalizations of elderly Americans are due to noncompliance with drug therapy (11%) and adverse drug reactions (17%). -- (*Archives of Internal Medicine*, April 1990.)

Health Outcomes, Improvement of

Pharmacist teaching and monitoring of drug therapy in a group of African-American asthma patients reduced emergency department (ED) visits by over 70% and hospitalizations by 80%, compared with no significant reduction in ED visits and a 50% reduction in hospitalizations in a control group receiving "usual care from local physicians." (Kelso TM, et al, *Am J Med Sciences*, June 1996)

Asthma patients who are high users of hospital emergency departments experienced an 80% decline in ED visits after ongoing pharmacist counseling. [Pauley TR, et al, *Annals of Pharmacotherapy*, Jan 1995]

Geriatric consumers, who account for about 30% of drug use in the U.S., were able to reduce the number of drugs taken and achieve significantly better compliance with their drug regimen after counseling by pharmacists, with no increase in costs. [Lipton HL, and Bird JA, *Gerontologist*, March 1994].

Ambulatory patients used significantly fewer health services, saving over \$640 a year in health costs per individual, as a result of comprehensive pharmacist counseling. [Borgsdorf LR, et al, *Am J Hosp Pharm*, March 1994].

Community pharmacists counseling patients identified and resolved problem drug therapy in ~2% of new prescription orders, with about 28% of these judged capable of causing "patient harm" if the pharmacist had not intervened. [Rupp MT, et al, *Medical Care*, Oct 1992].

Physicians accepted 83% of pharmacist recommendations for drug therapy changes in an ambulatory care clinic. In 80% of recommendations, "improvement or resolution of a patient's disease state" and cost reductions occurred. [Lobas NH, et al, *Am J Hosp Pharm*, July 1992].

Medicare would realize net savings of \$280,000, 139 hospitalizations, and 63 deaths per 100,000 enrollees each year if it paid pharmacists to advise enrollees to be vaccinated for influenza, according to an estimate based on an experiment in North Carolina. [Grabenstein JD, et al, *Medical Care* June 1992.]

Adding a clinical pharmacist to a hospital-based geriatric clinic reduced the number of medications associated with an adverse drug reaction by 42% and produced direct cost savings of \$54/patient within six months. [Phillips SL, Carr-Lopez SM. *Am J Hosp Pharm* May 1990]

Hypertensive patients who received pharmacist counseling were more compliant with their treatment, and achieved better blood pressure control, than a control group. [McKenney JM, et al, *Circulation*, Nov. 1973; McKenney JM, et al, *Contemp Pharm Pract*, Fall 1978]

Relative to a control group, diabetic patients who received pharmaceutical care were more compliant in keeping clinic appointments, made fewer medication errors, saw symptoms improve in 5 of 8 variables measured, and had a lower incidence of hospital admissions and "medical contacts". [Sczupak CA, Conrad WF, *Am J Hosp Pharm*, Nov 1977].

A clinical-pharmacist run anticoagulation clinic improved anticoagulation control, reduced bleeding and thromboembolic event rates, and saved \$162,058 per 100 patients annually in reduced hospitalizations and emergency department visits. [Chiquette E, Amato MG, and Bussey HI, *Arch Intern Med*. 1998; 158:1641-1747]

Using a system integrating computers, pharmacists, and physicians, a total of 43,007 DUR alerts were generated. Rate of change to a more appropriate therapeutic agent was 24%. Except for the rate of change for beta blockers in patients with chronic obstructive pulmonary disease, all rates of change were significantly greater than the expected 2% rate of change. (Monane M *et al*, *JAMA*, October 14, 1998

Hyperlipidemia

Project ImPACT (**I**mprove **P**ersistence **A**nd **C**ompliance with **T**herapy):Hyperlipidemia, initiated in 1996, is an ongoing, two-year, community-pharmacy based demonstration project being conducted by the American Pharmacists Association Foundation. The project is documenting the contributions pharmacists can make to health and quality of life in patients with lipid disorders. As of spring 1998, pharmacists at 29 of the original 32 sites were continuing to conduct cholesterol testing and provide

this patient-focused disease state management service in their practice. In preliminary results in 469 patients who had continued in the project for an average of 14 months, observed rates for persistence and compliance with medication therapy were 84.0% and 84.3% respectively, and 44.3% of the patients had reached their National Cholesterol Education Program (NCEP) lipid goals. (Bluml BM, McKenney JM, Cziraky MJ and Elswick RK, Jr, Interim report from Project ImPACT:Hyperlipidemia *J Amer Pharm Assoc* 1998. 38:529-534

Immunization

Pneumococcal disease among nursing home residents is almost 14 times as prevalent as in the noninstitutionalized elderly population. Yet only 30% of older Americans have been vaccinated against pneumococcal disease, and in all reported U.S. nursing home outbreaks fewer than 5% of residents have been vaccinated. In a 1996 outbreak in which several unimmunized residents died, only 3 of 78 residents were appropriately immunized (most had flu shots only). Infected staff were the likely source of the epidemic. "Nursing homes should offer pneumococcal vaccine to all eligible residents and to new residents on admission to the facility. All persons 65 or older should be vaccinated if their vaccination status is unknown. Improved vaccine coverage...should be the foundation for preventing outbreaks of pneumococcal disease in long term care facilities." -- [Nuorti JP, et al. An outbreak of multidrug-resistant pneumococcal pneumonia and bacteremia among unvaccinated nursing home residents. *New England Journal of Medicine* 1998;338:1861-8.]

Each year, 32,800 people die from pneumococcal disease and 20,000 die from influenza--almost all elderly. Medicare spends as much as \$1 billion for treatment of influenza-associated diseases each year. Seventy-three percent of the elderly have never been immunized for pneumococcal pneumonia; 49% of the elderly have not been vaccinated against influenza. - [U.S. GAO. Immunization: HHS could do more to increase vaccination among older adults. GAO/HEHS-95-152. June 1995.]

Influenza vaccination reduced hospitalization costs an average of \$117 for each of the 41,418 elderly people immunized during a three-year period. - [Nichol KL, Margolis KL, et al. The efficacy and cost effectiveness of vaccination against influenza among elderly persons living in the community. *N Engl J Med.* 1994;331:778-84.]

Only two percent of 276 residents of three long-term care facilities were immunized against influenza and pneumococcal pneumonia prior to pharmacist intervention. Rates improved to 84% in two intervention facilities and to 4% in the control facility. - [Morton MR, et al. Pharmacist impact on pneumococcal vaccination rates in long-term-care facilities. *Amer J Hosp Pharm* 1988-;45:73.]

Vaccine-Preventable Morbidity and Mortality

Randomized controlled trial. Pharmacists in three community pharmacies produced a 74% increase in vaccination rates compared to a control facility, by advising at-risk patients of infection risk and describing where to be vaccinated. [Grabenstein JD, et al. Community Pharmacists as Immunization Advocates: A Pharmacoepidemiologic Experiment, *Int J Phar Prac.* 1993;2:5-10.]

Medicare would realize net savings of \$280,000, 139 hospitalizations, and 63 deaths per 100,000 enrollees each year if it paid pharmacists to advise enrollees to be vaccinated for influenza, according to an estimate based on an experiment in North Carolina. [Grabenstein JD, et al. Community Pharmacists as Immunization Advocates: Cost-effectiveness of a Cue to Influenza Vaccination,

i>Med Care. 1992;30:503-13]

Ambulatory Care. A pharmacist developed an immunization intervention program resulting in a 29% and 45% increase, respectively, in the number of patients over age 65 who received influenza vaccinations during 1987 and 1988. The initiative included educating nursing staff, dissemination of information sheets to patients, displaying wall posters, placing reminders in patient charts, and adve

Copyright ©2006 American Pharmacists Association. All rights reserved

Appendix B

Literature Search on Pharmacy, Quality, and Measures

Reference List

1. Franic D, Jiang J. Potentially inappropriate drug use and health-related quality of life in the elderly. *Pharmacotherapy* [serial online]. 2006;26(6 (Print)):768-778
2. Bunting B, Cranor C. The Asheville Project: long-term clinical, humanistic, and economic outcomes of a community-based medication therapy management program for asthma. *Journal Of The American Pharmacists Association: Japha* [serial online]. 2006;46(2 (Print)):133-147
3. Berthiaume J, Chung R, Ryskina K, Walsh J, Legorreta A. Aligning financial incentives with quality of care in the hospital setting. *Journal For Healthcare Quality: Official Publication Of The National Association For Healthcare Quality* [serial online]. 2006;28(2 (Print)):36.
4. Nair K, Saseen J. Quality assessment of dyslipidemia in managed care: current best evidence should be used to benchmark quality. *The Annals Of Pharmacotherapy* [serial online]. 2006;40(1 (Print)):124-127.
5. Helling D, Nelson K, Ramirez J, Humphries T. Kaiser Permanente Colorado Region Pharmacy Department: innovative leader in pharmacy practice. *Journal Of The American Pharmacists Association: Japha* [serial online]. 2006;46(1 (Print)):67-76.
6. Ragucci K, Fermo J, Wessell A, Chumney E. Effectiveness of pharmacist-administered diabetes mellitus education and management services. *Pharmacotherapy* [serial online]. 2005;25(12 (Print)):1809-1816.
7. Worley M. Optimizing pharmacists' effectiveness as medication therapy managers through a segmentation approach. *Journal Of The American Pharmacists Association: Japha* [serial online]. 2005;45(5 (Print)):593-599.
8. Milchak J, Carter B, James P, Ardery G. Measuring adherence to practice guidelines for the management of hypertension: an evaluation of the literature. *Hypertension* [serial online]. 2004;44(5 (Electronic)):602-608.
9. Côté I, Grégoire J, Moisan J, Chabot I. Quality of life in hypertension: the SF-12 compared to the SF-36. *The Canadian Journal Of Clinical Pharmacology = Journal Canadien De Pharmacologie Clinique* [serial online]. 2004;11(2 (Electronic)):e232-8
10. Wong I, Campion P, Coulton S, et al. Pharmaceutical care for elderly patients shared between community pharmacists and general practitioners: a randomised evaluation. RESPECT (Randomised Evaluation of Shared Prescribing for Elderly people in the Community over Time) [ISRCTN16932128]. *BMC Health Services Research [Electronic Resource]* [serial online]. 2004;4(1 (Electronic)):11-11.
11. Aparasu R, Mort J. Prevalence, correlates, and associated outcomes of potentially inappropriate psychotropic use in the community-dwelling elderly. *The American Journal Of Geriatric Pharmacotherapy* [serial online]. 2004;2(2 (Print)):102-111.
12. Charbonneau A, Rosen A, Owen R, et al. Monitoring depression care: in search of an accurate quality indicator. *Medical Care* [serial online]. 2004;42(6 (Print)):522-531.
13. Schell K, Melton E, Woodruff A, Corbin G. Self-regulation, engagement, motivation, and performance in a simulated quality control task. *Psychological Reports* [serial online]. 2004;94(3 Pt 1 (Print)):944-954.

14. Joish V, Malone D, Wendel C, Mohler M. Profiling quality of diabetes care in a Veterans Affairs Healthcare System. *American Journal Of Medical Quality: The Official Journal Of The American College Of Medical Quality* [serial online]. 2004;19(3 (Print)):112-120.
15. Fuhlbrigge A, Carey V, Adams R, et al. Evaluation of asthma prescription measures and health system performance based on emergency department utilization. *Medical Care* [serial online]. 2004;42(5 (Print)):465-471.
16. Lalonde L, O'Connor A, Joseph L, Grover S. Health-related quality of life in cardiac patients with dyslipidemia and hypertension. *Quality Of Life Research: An International Journal Of Quality Of Life Aspects Of Treatment, Care And Rehabilitation* [serial online]. 2004;13(4 (Print)):793-804.
17. Curtiss F, Fry R, Avey S. Framework for pharmacy services quality improvement--a bridge to cross the quality chasm. Part I. The opportunity and the tool. *Journal Of Managed Care Pharmacy: JMCP* [serial online]. 2004;10(1 (Print)):60-78.
18. Kelly W. The quality of published adverse drug event reports. *The Annals Of Pharmacotherapy* [serial online]. 2003;37(12 (Print)):1774-1778.
19. Sturgess I, McElnay J, Hughes C, Crealey G. Community pharmacy based provision of pharmaceutical care to older patients. *Pharmacy World & Science: PWS* [serial online]. 2003;25(5 (Print)):218-226.
20. Morris C, Cantrill J. Preventing drug-related morbidity--the development of quality indicators. *Journal Of Clinical Pharmacy And Therapeutics* [serial online]. 2003;28(4 (Print)):295-305
21. Aubert R, Fulop G, Xia F, Thiel M, Maldonato D, Woo C. Evaluation of a depression health management program to improve outcomes in first or recurrent episode depression. *The American Journal Of Managed Care* [serial online]. 2003;9(5 (Print)):374-380.
22. Charbonneau A, Rosen A, Ash A, et al. Measuring the quality of depression care in a large integrated health system. *Medical Care* [serial online]. 2003;41(5 (Print)):669-680.
23. Cranor C, Christensen D. The Asheville Project: short-term outcomes of a community pharmacy diabetes care program. *Journal Of The American Pharmaceutical Association (Washington, D.C.: 1996)* [serial online]. 2003;43(2 (Print)):149-159.
24. Cranor C, Christensen D. The Asheville Project: factors associated with outcomes of a community pharmacy diabetes care program. *Journal Of The American Pharmaceutical Association (Washington, D.C.: 1996)* [serial online]. 2003;43(2 (Print)):160-172.
25. Parker J, McCombs J, Graddy E. Can pharmacy data improve prediction of hospital outcomes? Comparisons with a diagnosis-based comorbidity measure. *Medical Care* [serial online]. 2003;41(3 (Print)):407-419.
26. Carter B, Chrischilles E, Scholz D, Hayase N, Bell N. Extent of services provided by pharmacists in the Iowa Medicaid Pharmaceutical Case Management program. *Journal Of The American Pharmaceutical Association (Washington, D.C.: 1996)* [serial online]. 2003;43(1 (Print)):24-33.
27. Crealey G, Sturgess I, McElnay J, Hughes C. Pharmaceutical care programmes for the elderly: economic issues. *Pharmacoeconomics* [serial online]. 2003;21(7 (Print)):455-465.
28. Korthuis P, Asch S, Mancewicz M, et al. Measuring medication: do interviews agree with medical record and pharmacy data?. *Medical Care* [serial online]. 2002;40(12 (Print)):1270-1282
29. Kowiatek J, Weber R, Schilling D, McKaveney T. Monitoring compliance with JCAHO standards using a medication-control review tool. *American Journal Of Health-System Pharmacy: AJHP: Official Journal Of The American Society Of Health-System Pharmacists* [serial online]. 2002;59(18 (Print)):1763-1767.

30. Morris C, Cantrill J. Preventable drug-related morbidity indicators in the U.S. and U.K. *Journal Of Managed Care Pharmacy: JMCP* [serial online]. 2002;8(5 (Print)):372-377
31. Gilbert A, Roughead E, Beilby J, Mott K, Barratt J. Collaborative medication management services: improving patient care. *The Medical Journal Of Australia* [serial online]. 2002;177(4 (Print)):189-192.
32. Taylor R, Manzo J, Sinnott M. Quantifying value for physician order-entry systems: a balance of cost and quality. *Healthcare Financial Management: Journal Of The Healthcare Financial Management Association* [serial online]. 2002;56(7 (Print)):44-48.
33. Morris C, Cantrill J, Hepler C, Noyce P. Preventing drug-related morbidity--determining valid indicators. *International Journal For Quality In Health Care: Journal Of The International Society For Quality In Health Care / Isqua* [serial online]. 2002;14(3 (Print)):183-198.
34. Use this report card to profile physicians on pharmacy use. *Clinical Resource Management* [serial online]. 2001;2(7):104-107.
35. Herborg H, Soendergaard B, Froekjaer B, et al. Improving drug therapy for patients with asthma--part 1: Patient outcomes. *Journal Of The American Pharmaceutical Association (Washington,D.C.: 1996)* [serial online]. 2001;41(4 (Print)):539-550.
36. Herborg H, Soendergaard B, Jorgensen T, et al. Improving drug therapy for patients with asthma--part 2: Use of antiasthma medications. *Journal Of The American Pharmaceutical Association (Washington,D.C.: 1996)* [serial online]. 2001;41(4 (Print)):551-559.
37. Krska J, Cromarty J, Arris F, et al. Pharmacist-led medication review in patients over 65: a randomized, controlled trial in primary care. *Age And Ageing* [serial online]. 2001;30(3 (Print)):205-211.
38. Gray S, Mahoney J, Blough D. Medication adherence in elderly patients receiving home health services following hospital discharge. *The Annals Of Pharmacotherapy* [serial online]. 2001;35(5 (Print)):539-545.
39. Volume C, Farris K, Kassam R, Cox C, Cave A. Pharmaceutical care research and education project: patient outcomes. *Journal Of The American Pharmaceutical Association (Washington,D.C.: 1996)* [serial online]. 2001;41(3 (Print)):411-420.
40. Dean B, Barber N, Schachter M. What is a prescribing error?. *Quality In Health Care: QHC* [serial online]. 2000;9(4 (Print)):232-237.
41. Benrimoj S, Langford J, Berry G, et al. Economic impact of increased clinical intervention rates in community pharmacy. A randomised trial of the effect of education and a professional allowance. *Pharmacoeconomics* [serial online]. 2000;18(5 (Print)):459-468.
42. Pedersen C, Rich E, Kralewski J, Feldman R, Dowd B, Bernhardt T. Primary care physician incentives in medical group practices. *Archives Of Family Medicine* [serial online]. 2000;9(5 (Print)):458-462.
43. Kerr E, McGlynn E, Van Vorst K, Wickstrom S. Measuring antidepressant prescribing practice in a health care system using administrative data: implications for quality measurement and improvement. *The Joint Commission Journal On Quality Improvement* [serial online]. 2000;26(4 (Print)):203-216.
44. Bluml B, McKenney J, Cziraky M. Pharmaceutical care services and results in project ImPACT: hyperlipidemia. *Journal Of The American Pharmaceutical Association (Washington,D.C.: 1996)* [serial online]. 2000;40(2 (Print)):157-165.
45. al-Shaqha W, Zairi M. Re-engineering pharmaceutical care: towards a patient-focused care approach. *International Journal Of Health Care Quality Assurance Incorporating Leadership In Health Services* [serial online]. 2000;13(4-5 (Print)):208-217.

46. Pickard A, Johnson J, Farris K. The impact of pharmacist interventions on health-related quality of life. *The Annals Of Pharmacotherapy* [serial online]. 1999;33(11 (Print)):1167-1172.
47. Ried L, Wang F, Young H, Awiphan R. Patients' satisfaction and their perception of the pharmacist. *Journal Of The American Pharmaceutical Association (Washington, D.C.: 1996)* [serial online]. 1999;39(6 (Print)):835.
48. Franic D, Pathak D, Mott D. Pharmaceutical care and health outcomes in community settings: a matched pair analysis of perceptions of hypertensive patients versus pharmacists. *Pharmacy Practice Management Quarterly* [serial online]. 1999;19(2 (Print)):1-17
49. Varma S, McElnay J, Hughes C, Passmore A, Varma M. Pharmaceutical care of patients with congestive heart failure: interventions and outcomes. *Pharmacotherapy* [serial online]. 1999;19(7 (Print)):860-869
50. Tully M, Cantrill J. Subjective outcome measurement--a primer. *Pharmacy World & Science: PWS* [serial online]. 1999;21(3 (Print)):101-109.
51. Hernandez L. [The pharmaceutical care and pain caused by cancer]. *Puerto Rico Health Sciences Journal* [serial online]. 1999;18(1 (Print)):47-51. Available from: MEDLINE, Ipswich, MA. Accessed July 13, 2006.
52. Facchinetti N, Campbell G, Jones D. Evaluating dispensing error detection rates in a hospital pharmacy. *Medical Care* [serial online]. 1999;37(1 (Print)):39-43. Available from: MEDLINE, Ipswich, MA. Accessed July 13, 2006.
53. Ungar W, Coyte P, Chapman K, MacKeigan L. The patient level cost of asthma in adults in south central Ontario. Pharmacy Medication Monitoring Program Advisory Board. *Canadian Respiratory Journal: Journal Of The Canadian Thoracic Society* [serial online]. 1998;5(6 (Print)):463-471.
54. Monane M, Matthias D, Nagle B, Kelly M. Improving prescribing patterns for the elderly through an online drug utilization review intervention: a system linking the physician, pharmacist, and computer. *JAMA: The Journal Of The American Medical Association* [serial online]. 1998;280(14 (Print)):1249-1252.
55. Hogue M, Bishop T. Do we really need quality measures in community pharmacy?. *Journal Of The American Pharmaceutical Association (Washington, D.C.: 1996)* [serial online]. 1998;38(2 (Print)):120-121.
56. Bentley J, Smith M, Banahan B, Frate D, Parks B. Quality of life assessment by community pharmacists: an exploratory study. *Quality Of Life Research: An International Journal Of Quality Of Life Aspects Of Treatment, Care And Rehabilitation* [serial online]. 1998;7(2 (Print)):175-186.
57. Kennie N, Schuster B, Einarson T. Critical analysis of the pharmaceutical care research literature. *The Annals Of Pharmacotherapy* [serial online]. 1998;32(1 (Print)):17-26.
58. Palmer R. Process-based measures of quality: the need for detailed clinical data in large health care databases. *Annals Of Internal Medicine* [serial online]. 1997;127(8 Pt 2 (Print)):733-738.
59. Schobben F, Hekster Y, van Zwieten-Boot B. Outcome measures for the assessment of new antiepileptic drugs. *Pharmacy World & Science: PWS* [serial online]. 1997;19(5 (Print)):223-226.
60. O'Malley C. Quality measurement for health systems: accreditation and report cards. *American Journal Of Health-System Pharmacy: AJHP: Official Journal Of The American Society Of Health-System Pharmacists* [serial online]. 1997;54(13 (Print)):1528-1535.
61. Aparasu R, Fliginger S. Inappropriate medication prescribing for the elderly by office-based physicians. *The Annals Of Pharmacotherapy* [serial online]. 1997;31(7-8 (Print)):823-829.
62. MacKinnon N. Performance measures in ambulatory pharmacy. *Pharmacy Practice Management Quarterly* [serial online]. 1997;17(1 (Print)):52-62.

63. Gupchup G, Wolfgang A, Thomas J. Development of a scale to measure directive guidance by pharmacists. *The Annals Of Pharmacotherapy* [serial online]. 1996;30(12 (Print)):1369-1375.
64. Cotterell C. Pharmacy and the proposed quality measures for managed care plans. *American Journal Of Health-System Pharmacy: AJHP: Official Journal Of The American Society Of Health-System Pharmacists* [serial online]. 1996;53(21 (Print)):2619-2622.
65. Gandhi S, Kong S. Quality-of-life measures in the evaluation of antihypertensive drug therapy: reliability, validity, and quality-of-life domains. *Clinical Therapeutics* [serial online]. 1996;18(6 (Print)):1276-1295. Available from: MEDLINE, Ipswich, MA. Accessed July 13, 2006.
66. Cheah S, Clark C, Goldberg L, Li Wan Po A, Phillips R. Outcome measures, pooled index and quality of life instruments in rheumatoid arthritis. *Journal Of Clinical Pharmacy And Therapeutics* [serial online]. 1996;21(5 (Print)):297-316.
67. McDaniel M, DeJong D. Using pharmacists' documentation of clinical activities to reclaim employees and reposition the department. *American Journal Of Health-System Pharmacy: AJHP: Official Journal Of The American Society Of Health-System Pharmacists* [serial online]. 1996;53(3 (Print)):285-288.
68. Smith C, Christensen D. Identification and clarification of drug therapy problems by Indian health service pharmacists. *The Annals Of Pharmacotherapy* [serial online]. 1996;30(2 (Print)):119-124.
69. Mullins C, Baldwin R, Perfetto E. What are outcomes?. *Journal Of The American Pharmaceutical Association (Washington,D.C.: 1996)* [serial online]. 1996;NS36(1 (Print)):39-49.
70. Barr J. The outcomes movement and health status measures. *Journal Of Allied Health* [serial online]. 1995;24(1 (Print)):13-28.
71. McCombs J, Cody M, Besinque K, et al. Measuring the impact of patient counseling in the outpatient pharmacy setting: the research design of the Kaiser Permanente/USC patient consultation study. *Clinical Therapeutics* [serial online]. 1995;17(6 (Print)):1188-1206.
72. Cullen D, Bates D, Small S, Cooper J, Nemeskal A, Leape L. The incident reporting system does not detect adverse drug events: a problem for quality improvement. *The Joint Commission Journal On Quality Improvement* [serial online]. 1995;21(10 (Print)):541-548.
73. Williams B, Betley C. Inappropriate use of nonpsychotropic medications in nursing homes. *Journal Of The American Geriatrics Society* [serial online]. 1995;43(5 (Print)):513-519.
74. van Leeuwen D. Are medication error rates useful as comparative measures of organizational performance?. *The Joint Commission Journal On Quality Improvement* [serial online]. 1994;20(4 (Print)):192-199.
75. Coons S, Kaplan R. Quality of life assessment: understanding its use as an outcome measure. *Hospital Formulary* [serial online]. 1993;28(5 (Print)):486.
76. Sclar D. Improving medication compliance: a review of selected issues. *Clinical Therapeutics* [serial online]. 1991;13(4 (Print)):436.
77. Gannon P. Documentation of drug interchange in the medical record. *Hospital Pharmacy* [serial online]. 1991;26(1 (Print)):14.
78. MacKeigan L, Larson L. Development and validation of an instrument to measure patient satisfaction with pharmacy services. *Medical Care* [serial online]. 1989;27(5 (Print)):522-536.
79. Bearce W, Willey G, Fox R, Coleman L. Documentation of clinical interactions: quality of care issues and economic considerations in critical care pharmacy. *Hospital Pharmacy* [serial online]. 1988;23(10 (Print)):883.
80. Hoffmann R, Bartt K, Berlin L, Frank B. Multidisciplinary quality assessment of a unit dose drug distribution system. *Hospital Pharmacy* [serial online]. 1984;19(3 (Print)):167.

81. Boylan J. Essential elements of quality control. *American Journal Of Hospital Pharmacy* [serial online]. 1983;40(11 (Print)):1936-1939.

Appendix C

Literature Search on Adherence, Persistence, and Medications

Appendix C

Literature Search on Adherence, Persistence, and Medications

To identify research on adherence and persistence that could be useful in identifying or developing measures in this area, a literature search was performed using the terms adherence, persistence, and medications. In addition to the literature search, a description of how adherence/persistence was measured is included (n/a = not available – meaning the article was not able to be obtained in time to be included in the environmental scan.).

Reference List

1. Curtis J, Westfall A, Allison J, Freeman A, Saag K. Channeling and adherence with alendronate and risedronate among chronic glucocorticoid users. *Osteoporosis International: A Journal Established As Result Of Cooperation Between The European Foundation For Osteoporosis And The National Osteoporosis Foundation Of The USA* [serial online]. 2006;17(8 (Print)):1268-1274.
 - a. n/a
2. Bartl R, Götte S, Hadji P, Hammerschmidt T. [Adherence with daily and weekly administration of oral bisphosphonates for osteoporosis treatment]. *Deutsche Medizinische Wochenschrift (1946)* [serial online]. 2006;131(22 (Print)):1257-1262.
 - a. Abstract: Compliance was measured by the medication possession ratio (MPR), namely the percentage of days on which the patient was supplied with the medication. An MPR > 80% is therapeutically relevant because the risk of fractures is significantly reduced
3. Gold D, Alexander I, Ettinger M. How can osteoporosis patients benefit more from their therapy? Adherence issues with bisphosphonate therapy. *The Annals Of Pharmacotherapy* [serial online]. 2006;40(6 (Print)):1143-1150.
 - a. **Printed**
4. Downey T, Foltz S, Boccuzzi S, Omar M, Kahler K. Adherence and persistence associated with the pharmacologic treatment of osteoporosis in a managed care setting. *Southern Medical Journal* [serial online]. 2006;99(6 (Print)):570-575.
 - a. Adherence - MPR (medication possession ratio) – calculated as total days of therapy dispensed over 365 days of follow up.
 - b. Persistence – continuous therapy on same drug for each month over entire study period.
5. Grégoire J, Moisan J, Guibert R, Ciampi A, Milot A. Predictors of self-reported noncompliance with antihypertensive drug treatment: a prospective cohort study. *The Canadian Journal Of Cardiology* [serial online]. 2006;22(4 (Print)):323-329.
 - a. Abstract – self reported compliance/non-compliance
6. Balkrishnan R, Rajagopalan R, Shenolikar R, Camacho F, Anderson R. Outcomes associated with introduction of thiazolidinedione therapy in Medicaid enrolled patients with type 2 diabetes: an updated and expanded retrospective analysis. *Current Medical Research And Opinion* [serial online]. 2006;22(3 (Print)):551-559.

- a. n/a
- 7. Reginster J. Adherence and persistence: impact on outcomes and health care resources. *Bone* [serial online]. 2006;38(2 Suppl 2 (Print)):S18-21.
 - a. n/a
- 8. Wilensky J, Fiscella R, Carlson A, Morris L, Walt J. Measurement of persistence and adherence to regimens of IOP-lowering glaucoma medications using pharmacy claims data. *American Journal Of Ophthalmology* [serial online]. 2006;141(1 Suppl (Print)):S28-33.
 - a. n/a
- 9. Atkinson M, Kumar R, Cappelleri J, Hass S. Hierarchical construct validity of the treatment satisfaction questionnaire for medication (TSQM version II) among outpatient pharmacy consumers. *Value In Health: The Journal Of The International Society For Pharmacoeconomics And Outcomes Research* [serial online]. 2005;8 Suppl 1:S9-s24.
 - a. n/a
- 10. Nordstrom B, Friedman D, Mozaffari E, Quigley H, Walker A. Persistence and adherence with topical glaucoma therapy. *American Journal Of Ophthalmology* [serial online]. 2005;140(4 (Print)):598-606.
 - a. Abstract: duration of continuous treatment with the initially prescribed medication (**persistence**) and the prevalence of use of the initial medication at various time points (**adherence**)
- 11. Epstein S, Zaidi M. Biological properties and mechanism of action of ibandronate: application to the treatment of osteoporosis. *Bone* [serial online]. 2005;37(4 (Print)):433-440.
 - a. n/a
- 12. Stempel D, Stoloff S, Carranza Rosenzweig J, Stanford R, Ryskina K, Legorreta A. Adherence to asthma controller medication regimens. *Respiratory Medicine* [serial online]. 2005;99(10 (Print)):1263-1267.
 - a. n/a
- 13. Patel N, Crismon M, Miller A, Johnsrud M. Drug adherence: effects of decreased visit frequency on adherence to clozapine therapy. *Pharmacotherapy* [serial online]. 2005;25(9 (Print)):1242-1247.
 - a. From abstract (full article n/a) - Adherence measures included persistence, medication possession ratio (MPR), and time taking clozapine.
- 14. Sveum R. Childhood asthma. Balancing efficacy and adherence for optimum management. *Postgraduate Medicine* [serial online]. 2005;118(3 (Print)):43-50.
 - a. n/a
- 15. Haab F, Castro-Diaz D. Persistence with antimuscarinic therapy in patients with overactive bladder. *International Journal Of Clinical Practice* [serial online]. 2005;59(8 (Print)):931-937.
 - a. n/a
- 16. Krueger K, Berger B, Felkey B. Medication adherence and persistence: a comprehensive review. *Advances In Therapy* [serial online]. 2005;22(4 (Print)):313-356.
 - a. n/a
- 17. Shaya F, Blume S, Gu A, Zyczynski T, Jumadilova Z. Persistence with overactive bladder pharmacotherapy in a Medicaid population. *The American Journal Of Managed Care* [serial online]. 2005;11(4 Suppl (Print)):S121-9.
 - a. Abstract: the rates of **persistence** by drug were analyzed.
 - b. Possession time, the degree to which patients keep medication available even though they may not be taking it daily as prescribed, was also measured

18. Hertz R, Unger A, Lustik M. Adherence with pharmacotherapy for type 2 diabetes: a retrospective cohort study of adults with employer-sponsored health insurance. *Clinical Therapeutics* [serial online]. 2005;27(7 (Print)):1064-1073.
 - a. Adherence – regular refilling of prescriptions as indicated, such that an appropriate supply of medication is available over time
19. Sanchez R, Crismon M, Barner J, Bettinger T, Wilson J. Assessment of adherence measures with different stimulants among children and adolescents. *Pharmacotherapy* [serial online]. 2005;25(7 (Print)):909-917.
 - a. Early non-persistence – failure to fill a second prescription for the index drug
 - b. Persistence – length of time from when the first prescription was filled to the date the last prescription would have been exhausted
 - c. MPR – total days’ supply of medication obtained during the period of persistence, divided by the corresponding number of calendar days.
 - i. Non-adherence is MPR of <0.80
20. Yu Y, Nichol M, Yu A, Ahn J. Persistence and adherence of medications for chronic overactive bladder/urinary incontinence in the california medicaid program. *Value In Health: The Journal Of The International Society For Pharmacoeconomics And Outcomes Research* [serial online]. 2005;8(4 (Print)):495-505
 - a. n/a
21. Huser M, Evans T, Berger V. Medication adherence trends with statins. *Advances In Therapy* [serial online]. 2005;22(2 (Print)):163-171.
 - a. Abstract: Length of therapy, persistence, **medication** possession ratio (MPR), and median gap between prescriptions were calculated
22. Van Wijk B, Klungel O, Heerdink E, de Boer A. Effectiveness of interventions by community pharmacists to improve patient adherence to chronic medication: a systematic review. *The Annals Of Pharmacotherapy* [serial online]. 2005;39(2 (Print)):319-328.
 - a. Pill counts
 - b. Self report
 - c. Pharmacy records
23. Khanderia U, Townsend K, Eagle K, Prager R. Statin initiation following coronary artery bypass grafting: outcome of a hospital discharge protocol. *Chest* [serial online]. 2005;127(2 (Print)):455-463
 - a. n/a
24. Balkrishnan R, Nelsen L, Kulkarni A, Pleasants R, Whitmire J, Schechter M. Outcomes associated with initiation of different controller therapies in a Medicaid asthmatic population: a retrospective data analysis. *The Journal Of Asthma: Official Journal Of The Association For The Care Of Asthma* [serial online]. 2005;42(1 (Print)):35-40.
 - a. n/a
25. Lin J, Lane J. Falls in the elderly population. *Physical Medicine And Rehabilitation Clinics Of North America* [serial online]. 2005;16(1 (Print)):109-128.
 - a. n/a
26. Wilson J, Axelsen K, Tang S. Medicaid prescription drug access restrictions: exploring the effect on patient persistence with hypertension medications. *The American Journal Of Managed Care* [serial online]. 2005;11 Spec No:SP27-34.
 - a. n/a

27. Grant R, O'Leary K, Weilburg J, Singer D, Meigs J. Impact of concurrent medication use on statin adherence and refill persistence. *Archives Of Internal Medicine* [serial online]. 2004;164(21 (Print)):2343-2348.
 - a. n/a
28. Balkrishnan R, Rajagopalan R, Shenolikar R, Camacho F, Whitmire J, Anderson R. Healthcare costs and prescription adherence with introduction of thiazolidinedione therapy in Medicaid type 2 diabetic patients: a retrospective data analysis. *Current Medical Research And Opinion* [serial online]. 2004;20(10 (Print)):1633-1640.
 - a. n/a
29. Walkup J, Sambamoorthi U, Crystal S. Use of newer antiretroviral treatments among HIV-infected medicaid beneficiaries with serious mental illness. *The Journal Of Clinical Psychiatry* [serial online]. 2004;65(9 (Print)):1180-1189.
 - a. n/a
30. Clowes J, Peel N, Eastell R. The impact of monitoring on adherence and persistence with antiresorptive treatment for postmenopausal osteoporosis: a randomized controlled trial. *The Journal Of Clinical Endocrinology And Metabolism* [serial online]. 2004;89(3 (Print)):1117-1123.
 - a. Abstract: Treatment **adherence** and **persistence** were assessed using electronic **monitoring** devices.
31. Carswell J, Beard K, Chevrette M, Pardue C, Hess D, Fagan S. Tracking trends in secondary stroke prevention strategies. *The Annals Of Pharmacotherapy* [serial online]. 2004;38(2 (Print)):215-219.
 - a. n/a
32. Stoloff S, Stempel D, Meyer J, Stanford R, Carranza Rosenzweig J. Improved refill persistence with fluticasone propionate and salmeterol in a single inhaler compared with other controller therapies. *The Journal Of Allergy And Clinical Immunology* [serial online]. 2004;113(2 (Print)):245-251.
 - a. Refill rates
33. LaFleur J, Oderda G. Methods to measure patient compliance with medication regimens. *Journal Of Pain & Palliative Care Pharmacotherapy* [serial online]. 2004;18(3 (Print)):81-87.
 - a. n/a
34. Gibson P, Damler R, Jackson E, Wilder T, Ramsey J. The impact of olanzapine, risperidone, or haloperidol on the cost of schizophrenia care in a medicaid population. *Value In Health: The Journal Of The International Society For Pharmacoeconomics And Outcomes Research* [serial online]. 2004;7(1 (Print)):22-35.
 - a. % whose prescription records indicated possession of the index medication 3 months (93 days) after initiating treatment
 - b. Mean number of days to first gap in therapy
 - c. Mean number of days with the index medication, as a percentage of 365
35. Kopjar B, Sales A, Piñeros S, Sun H, Li Y, Hedeem A. Adherence with statin therapy in secondary prevention of coronary heart disease in veterans administration male population. *The American Journal Of Cardiology* [serial online]. 2003;92(9 (Print)):1106-1108.
 - a. n/a
36. Malone M, Alger-Mayer S. Pharmacist intervention enhances adherence to orlistat therapy. *The Annals Of Pharmacotherapy* [serial online]. 2003;37(11 (Print)):1598-1602.
 - a. n/a

37. Krueger K, Felkey B, Berger B. Improving adherence and persistence: a review and assessment of interventions and description of steps toward a national adherence initiative. *Journal Of The American Pharmacists Association: Japha* [serial online]. 2003;43(6 (Print)):668.
 - a. n/a
38. Wogen J, Kreilick C, Livornese R, Yokoyama K, Frech F. Patient adherence with amlodipine, lisinopril, or valsartan therapy in a usual-care setting. *Journal Of Managed Care Pharmacy: JMCP* [serial online]. 2003;9(5 (Print)):424-429.
 - a. n/a
39. Richter A, Anton S, Koch P, Dennett S. The impact of reducing dose frequency on health outcomes. *Clinical Therapeutics* [serial online]. 2003;25(8 (Print)):2307.
 - a. n/a
40. Al-Zakwani I, Barron J, Bullano M, Arcona S, Drury C, Cockerham T. Analysis of healthcare utilization patterns and adherence in patients receiving typical and atypical antipsychotic medications. *Current Medical Research And Opinion* [serial online]. 2003;19(7 (Print)):619-626.
 - a. n/a
41. Becker S, Dezii C, Burtcel B, Kawabata H, Hodder S. Young HIV-infected adults are at greater risk for medication nonadherence. *Medgenmed [Electronic Resource]: Medscape General Medicine* [serial online]. 2002;4(3 (Electronic)):21-21.
 - a. Adherence was defined as the proportion of days on which drugs were taken during the first 365 days of therapy
 - b. Persistence was assessed according to whether prescriptions were refilled over time within a tolerable threshold (60 days).
42. Bonner S, Zimmerman B, Evans D, Irigoyen M, Resnick D, Mellins R. An individualized intervention to improve asthma management among urban Latino and African-American families. *The Journal Of Asthma: Official Journal Of The Association For The Care Of Asthma* [serial online]. 2002;39(2 (Print)):167-179.
 - a. n/a
43. Düsing R. Adverse events, compliance, and changes in therapy. *Current Hypertension Reports* [serial online]. 2001;3(6 (Print)):488-492.
 - a. n/a
44. Ostrop N, Gill M. Antiretroviral medication adherence and persistence with respect to adherence tool usage. *AIDS Patient Care And Stds* [serial online]. 2000;14(7 (Print)):351-358
 - a. Adherence – pharmacy refill data
 - b. Persistence – duration subject remains on therapy (per pt/ per chart)

Appendix D

BOX 4-3 Criteria for Measure Selection Considered by the Committee and Other Selected Groups¹⁰

- **Scientifically Sound:** This criterion concerns the reliability, validity, and explicitness of the evidence base. Reliability means a measure consistently produces the same result when repeated within the same population and setting. Validity addresses the question of whether a measure reflects what it is intended to measure. Finally, the evidence base from which a measure is derived must be explicit—for example, randomized controlled trials, case control studies, observational studies, or formal consensus processes.
- **Feasibility:** To assess feasibility, the data needed for a measure must be in current use, available across the system, and examined for the cost or burden of measurement on providers.
- **Importance:** The health problem addressed by a measure should be a leading cause of death or disability or associated with high resource use. A measure must have an impact on health, be tied to national goals and be susceptible to being influenced by the health care delivery system. Ideally, a measure should be stratified by race, gender, and age.
- **Alignment:** Optimally, measures should be selected from existing leading measure sets that are calculated with the same technical specifications for both the numerator and denominator to reduce redundancy and the burden of reporting.

Comprehensiveness: Measures selected should be part of a set to reflect quality in a particular area of care or bundled services of necessary care for a given condition. Each measure in the set should meet the criterion of importance to warrant inclusion. To demonstrate comprehensiveness, the set of measures must address the way the care is delivered and the nature of the quality problem involved—underuse, misuse, or overuse.

¹⁰ Committee on Redesigning Health Insurance Performance Measures, Payment, and Performance Improvement Programs, Board on Health Care Services, *Performance Measurement: Accelerating Improvement*, Institute of Medicine of the National Academies, National Academies Press, 2006.

Appendix E

TABLE ES-2 Recommended Starter Set of Performance Measures

Ambulatory Care	<p>Ambulatory care Quality Alliance (26) Prevention measures^a (7), coronary artery disease^a (3), heart failure^a (2), diabetes^a (6), asthma^a (2), depression^a (2), prenatal care^a (2), quality measures addressing overuse or misuse (2)</p> <p>Ambulatory Care Survey CAHPS Clinician and Group Survey: getting care quickly, getting needed care, how well providers communicate, health promotion and education, shared decision making, knowledge of medical history, how well office staff communicate</p>
Acute Care	<p>Hospital Quality Alliance (20) Acute coronary syndrome^a (7), heart failure^a (3), pneumonia^a (5), smoking cessation^a (3), surgical infection prevention^a (from the Surgical Care Improvement Project) (2)</p> <p>Structural Measures (computerized provider order entry, intensive care unit intensivists, evidence-based hospital referrals)</p> <p>Hospital CAHPS Patient communication with physicians, patient communication with nurses, responsiveness of hospital staff, cleanliness/noise level or physical environment, pain control, communications about medicines, discharge information</p>
Health Plans and Accountable Health Organizations	<p>Health Plan Employer Data and Information Set (HEDIS) (61) Integrated delivery systems (health maintenance organizations): effectiveness (26), access/availability of care (8), satisfaction with the experience of care (4), health plan stability (2), use of service (15), cost of care, informed health care choices, health plan descriptive information (6)</p> <p>Preferred provider organizations within Medicare Advantage: selected administrative data and hybrid measures</p> <p>Ambulatory Care Survey CAHPS Health Plan Survey: getting care quickly, getting needed care, how well providers communicate, health plan paperwork, health plan customer service</p>
Long-Term Care	<p>Minimum Data Set (15) Long-term care (12), short-stay care (3)</p> <p>Outcome and Assessment Information Set (11) Ambulation/locomotion (1), transferring (1), toileting (1), pain (1), bathing (2), management of oral medications (1), acute care hospitalization (1), emergent care (1), confusion (1)</p>
End-Stage Renal Disease	<p>National Healthcare Quality Report (5) Transplant registry and results (2), dialysis effectiveness (2), mortality (1)</p>
Longitudinal Measures of Outcomes and Efficiency	<p>1-year mortality, resource use, and functional status (SF-12) after acute myocardial infarction</p>

Appendix F

AMCP/NCQA White Paper Measures¹¹

I. Measures Identified Specific to the Pharmacy Quality Alliance Starter Set of Measures

MTM Services

1. Diabetes

1.1. Adherence and Persistence

<u>Specific Category:</u>	<u>Creator</u> <u>Pharmacy Relevance</u> <u>Care Setting</u> <u>IOM Aim primary</u>	<u>Donabedian</u> <u>Lead/Lag</u>
Diabetes Adverse Drug Events (Diabetes): Identification of ADRs, and associated interventions to address the reaction	AMCP/NCQA (WHITE PAPER) Follow-up All Effective	Process Lead
Medication Underuse (Diabetes): Adherence and persistence to oral hypoglycemic agent therapy	AMCP/NCQA (WHITE PAPER) Drug All Effective	Process Lead
Medication Overuse (Diabetes): Identification and prevention of hospital admissions related to medication overuse, namely hypoglycemia	AMCP/NCQA (WHITE PAPER) Monitoring All Safe	Process Lag
Medication Overuse (Diabetes): Use of an oral hypoglycemic agent at higher-than-recommended dosage	AMCP/NCQA (WHITE PAPER) Monitoring All Safe	Process Lead
Medication Overuse (Diabetes): Use of two or more oral hypoglycemic agents with the same medication class	AMCP/NCQA (WHITE PAPER) Drug All Safe	Process Lead
1.2.1 Adequacy of Therapy: Presence of ACE/ARB therapy: Medication Underuse (Diabetes): Patients with a claim for an oral hypoglycemic medication or insulin with claims for an antihypertensive agent but no claims for an ACE-inhibitor or ARB	AMCP/NCQA (WHITE PAPER) Drug All Effective	Process Lead

¹¹ AMCP/NCQA Developing a Robust Quality Measurement Approach for Medicare Part D, White Paper, May 2006.

1.2.2 Adequacy of Therapy: Presence of a statin:

Adverse Drug Events (Cardiovascular Diseases): HMG CoA reductase inhibitor use with verapamil or amiodarone

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

Adverse Drug Events (Cardiovascular Diseases): HMG-CoA reductase inhibitor use with protease inhibitors

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

Adverse Drug Events (Cardiovascular Diseases): Frequency of concomitant use of lipid-lowering medications and medications that may worsen the lipid profile, such as rosiglitazone and olanzapine

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

Medication Underuse (Cardiovascular Diseases): Patients with stable coronary artery disease or history of acute MI receiving a HMG-CoA reductase inhibitor

AMCP/NCQA (WHITE PAPER)
Drug
Amb/Long Term Care
Effective
Process
Lead

2. Hyperlipidemia

2.1 Adherence and Persistence: medication possession ratio

Adverse Drug Events (Cardiovascular Diseases): HMG CoA reductase inhibitor use with verapamil or amiodarone

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Lead
Process

Adverse Drug Events (Cardiovascular Diseases): HMG-CoA reductase inhibitor use with protease inhibitors

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Lead
Process

Adverse Drug Events (Cardiovascular Diseases): Frequency of concomitant use of lipid-lowering medications and medications that may worsen the lipid profile, such as rosiglitazone and olanzapine

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Lead
Process

Medication Underuse (Cardiovascular Diseases): Patients with stable coronary artery disease or history of acute MI receiving a HMG-CoA reductase inhibitor

AMCP/NCQA (WHITE PAPER)
Drug
Amb/Long Term Care
Effective
Lead
Process

4. Hypertension:

4.1 Adherence & Persistence – Medication Possession Ratio

Hypertension

Adverse Drug Events (Cardiovascular Diseases): Frequency of use of an ACE-inhibitor and a potassium-sparing diuretic

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

Medication Underuse (Cardiovascular Diseases): Frequency of antihypertensive agent monotherapy

AMCP/NCQA (WHITE PAPER)
Drug
Process

All
Effective

Lead

Medication Underuse (Cardiovascular Diseases):
Adherence and persistence to ACE-inhibitor/ARB therapy

AMCP/NCQA (WHITE PAPER)
Drug
All
Effective

Process
Lead

Medication Underuse (Cardiovascular Diseases):
Beta-blocker adherence and persistence

AMCP/NCQA (WHITE PAPER)
Drug
All
Effective

Process
Lead

Medication Overuse (Cardiovascular Diseases):
Frequency of short-acting calcium-channel blocker use

AMCP/NCQA (WHITE PAPER)
Drug
All
Effective

Process
Lead

Medication Overuse (Cardiovascular Diseases):
Frequency of use of a calcium-channel blocker without
other antihypertensive agent

AMCP/NCQA (WHITE PAPER)
Drug
All
Effective

Process
Lead

Medication Overuse (Cardiovascular Diseases):
Frequency of ingredient duplication

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe

Process
Lead

Medication Overuse (Cardiovascular Diseases):
Frequency of therapeutic duplication (i.e., concomitant
use of more than one agent from the same medication
class).

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe

Process
Lead

5. Heart Failure:

5.1 Adherence & Persistence – Medication Possession Ratio

Medication Underuse (Cardiovascular Diseases):
Proportion of patients with a diagnosis of heart failure or
history of MI who are not receiving at least one
cardiovascular medication

AMCP/NCQA (WHITE PAPER)
Monitoring
All
Effective

Process
Lead

Medication Underuse (Cardiovascular Diseases): Post-MI
and heart failure patients receiving and ACE-inhibitor or
ARB

AMCP/NCQA (WHITE PAPER)
Drug
Amb/Long Term Care
Effective

Process
Lead

Medication Underuse (Cardiovascular Diseases): Post-MI
and heart failure patients receiving a beta-blocker

AMCP/NCQA (WHITE PAPER)
Drug
Amb/Long Term Care
Effective

Process
Lead

Medication Underuse (Cardiovascular Diseases): Beta-blocker adherence and persistence	AMCP/NCQA (WHITE PAPER) Drug All	Process Lead
Medication Overuse (Cardiovascular Diseases): Proportion of patients receiving beta-blocker monotherapy	AMCP/NCQA (WHITE PAPER) Drug All Effective Effective	Process Lead

5.2.2 Heart Failure: Adequacy of Therapy: Presence of ACE/ARB

Medication Underuse (Cardiovascular Diseases): Post-MI and heart failure patients receiving and ACE-inhibitor or ARB	AMCP/NCQA (WHITE PAPER) Drug Amb/Long Term Care Effective	Process Lead
--	--	-----------------

5.2.1 Heart Failure: Adequacy of Therapy: Presence of Beta-Blocker

Medication Underuse (Cardiovascular Diseases): Post-MI and heart failure patients receiving a beta-blocker	AMCP/NCQA (WHITE PAPER) Drug Amb/Long Term Care Effective	Process Lead
---	--	-----------------

6.1 Patient Safety – IOM “Safe” primary classification:

Medication Management

Change in the number of PIM (Potentially Inappropriate Medication) claims and members with a PIM claim since the previous reporting period	AMCP/NCQA (WHITE PAPER) Drug All Safe	Process Lag
--	--	----------------

Rate of medication doses above the maximum recommended dose per 1,000 claims	AMCP/NCQA (WHITE PAPER) Monitoring All Safe	Process Lag
---	--	----------------

Number of PIM (Potentially Inappropriate Medication) claims, reported as an average number of PIM claims per 1,000 members.	AMCP/NCQA (WHITE PAPER) Drug All Safe	Outcome Lag
---	--	----------------

Number of members who received one PIM (Potentially Inappropriate Medication) or more than one PIM during the reporting period, reported as a percentage of overall membership	AMCP/NCQA (WHITE PAPER) Drug All Safe	Process Lead
---	--	-----------------

Coronary Artery Disease

Adverse Drug Events (Cardiovascular Diseases): Frequency of concomitant use of lipid-lowering medications and medications that may worsen the lipid profile, such as rosiglitazone and olanzapine	AMCP/NCQA (WHITE PAPER) Drug All Safe	Process Lead
--	--	-----------------

Adverse Drug Events (Cardiovascular Diseases): HMG-CoA reductase inhibitor use with protease inhibitors	AMCP/NCQA (WHITE PAPER) Drug All	Process Lead
---	--	-----------------

Safe

Adverse Drug Events (Cardiovascular Diseases):
HMG CoA reductase inhibitor use with verapamil or
amiodarone

AMCP/NCQA (WHITE PAPER)
Drug Process
All Lead
Safe

Medication Overuse (Diabetes): Identification and
prevention of hospital admissions related to
medication overuse, namely hypoglycemia

AMCP/NCQA (WHITE PAPER)
Monitoring Process
All Lag
Safe

Medication Overuse (Diabetes): Use of
chlorpropamide among patients 65 years or older

AMCP/NCQA (WHITE PAPER)
Drug Process
All Lead
Safe

Diabetes

Medication Overuse (Diabetes): Use of two or more
oral hypoglycemic agents with the same medication
class

AMCP/NCQA (WHITE PAPER)
Drug Process
All Lead
Safe

Medication Overuse (Diabetes): Use of an oral
hypoglycemic agent at higher-than-recommended
dosage

AMCP/NCQA (WHITE PAPER)
Monitoring Process
All Lead
Safe

Hypertension

Adverse Drug Events (Cardiovascular Diseases):
Frequency of use of an ACE-inhibitor and a
potassium-sparing diuretic

AMCP/NCQA (WHITE PAPER)
Drug Process
All Lead
Safe

Medication Overuse (Cardiovascular Diseases):
Frequency of therapeutic duplication (i.e.,
concomitant use of more than one agent from the
same medication class).

AMCP/NCQA (WHITE PAPER)
Drug Process
All Lead
Safe

Medication Overuse (Cardiovascular Diseases):
Frequency of ingredient duplication

AMCP/NCQA (WHITE PAPER)
Drug Process
All Lead
Safe

Adverse Drug Events (Cardiovascular Diseases):
Identification and prevention of hospital admissions
for hyperkalemia

AMCP/NCQA (WHITE PAPER)
Monitoring Process
All Lag

Mental Illness

Medication Overuse (Mental Health Conditions):
Identification and prevention of hospital admissions
for psychotropic medication toxicity

Safe
AMCP/NCQA (WHITE PAPER)
Monitoring Process
All Lead
Safe

Adverse Drug Events (Mental Health Conditions):
Prevention of medication combinations associated
with additive toxicity

AMCP/NCQA (WHITE PAPER)
Monitoring
All
Safe
Process
Lead

Other

Frequency of use of a sedative-hypnotic medication
for an excessive time period

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

6.2 Patient Safety – IOM “Safe” primary classification specific to elderly patients:

Diabetes

Medication Overuse (Diabetes): Use of
chlorpropamide among patients 65 years or older

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

Mental Illness

Medication Overuse (Mental Health Conditions): Use
of potentially-inappropriate psychotropic medications
by elderly patients

AMCP/NCQA (WHITE PAPER)
Drug
All
Safe
Process
Lead

Table 1. Examples of JCAHO medication-use indicators for hospitals¹²

Measure Domain	Indicator	Population / Caveats ^a
Antibiotic Prophylaxis	Proportion of surgical patients who received antibiotics within one hour prior to surgical incision	All patients eligible for prophylactic antibiotics (separate indicators can be calculated for each type of surgery).
Pneumonia	Median time from arrival at the hospital to the administration of the first dose of antibiotic	Patients with a principal diagnosis of pneumonia, or septicemia with respiratory failure.
Heart Failure	Proportion of heart failure patients who are prescribed an ACEI or ARB at hospital discharge ^b	Patients with left ventricular systolic dysfunction
Acute myocardial infarction (AMI)	Proportion of AMI patients who are prescribed a beta-blocker at hospital discharge	Patients with a principal diagnosis of AMI

a. Not all inclusion and exclusion criteria are shown in this table

b. ACEI = angiotensin-converting enzyme inhibitor; ARB = angiotensin receptor blocker

¹² Safe and Effective? MacKinnon NJ, ed. Canadian Pharmacists Association, Ottawa, ON; in production (to be published Jan 2007).

Table 2. Examples of medication-use indicators for health plans.¹³

Measure Domain	Indicator	Population / Caveats ^a
Asthma	Proportion of patients with persistent asthma who are prescribed a controller medication deemed appropriate by the National Heart, Lung and Blood Institute ^b	Separate measures are created for children (ages 5-9), adolescents (ages 10-17), and adults (ages 18-56).
Depression	Acute Phase: Proportion of patients who were diagnosed with a new episode of depression, treated with antidepressant medication and remained on antidepressant medication during the entire 12-week acute phase of treatment.	Additional measures can be constructed for the chronic phase of treatment. Numerous exclusion criteria could be applied to enhance validity of assessment.
Diabetes / Lipids	Proportion of patients with diabetes who had LDL-c controlled to < 130 mg/dL ^b Proportion of patients with diabetes mellitus who had an LDL-c level > 130 mg/dL in the previous year and who meet the following criteria in the reporting year: 1) started taking cholesterol-lowering medication; 2) had dose of cholesterol-lowering medication increased; 3) had repeat measurement of LDL-c that was < 130 mg/dL ^c	This measure could also be applied to any patient with elevated LDL. Different target values could also be used for LDL (NCQA also uses a measure with 100mg/dL as a target for LDL).
Drug Monitoring	Proportion of patients dispensed metformin who had a baseline and follow-up test of renal function ^d	Measures could be constructed for any drug that requires laboratory monitoring.
Persistence to Beta-blocker Therapy	Proportion of patients 35 years and older who were hospitalized and discharged from the hospital after surviving a heart attack and who received one or more prescriptions for a beta-blocker covering a period of at least six months after discharge ^b	This was a new measure for HEDIS in 2004

a. Not all inclusion/exclusion criteria are shown in this table.

b. from NCQA HEDIS indicators.¹⁰

c. example of a tightly-linked measure as suggested by Kerr et al. (2001).¹²

d. from Nau (2002).²⁶

¹³ Safe and Effective? MacKinnon NJ, ed. Canadian Pharmacists Association, Ottawa, ON; in production (to be published Jan 2007).

Table 3. Examples of medication-use indicators for long-term care facilities^{a14}

Measure Domain	Indicator
Behavior/Emotion	Prevalence of symptoms of depression without antidepressant therapy
Clinical Management	Patients who use of 9 or more different medications
Psychotropic drug use	Prevalence of antipsychotic use, in the absence of psychotic or related conditions Prevalence of antianxiety/hypnotic use Prevalence of hypnotic use more than two times in last week

a. These examples were taken from the Minimum Data Set for long-term care facilities as specified by CMS.¹⁵

¹⁴ Safe and Effective? MacKinnon NJ, ed. Canadian Pharmacists Association, Ottawa, ON; in production (to be published Jan 2007).

Table 4. Potential Indicators for Evaluating the Quality of Community Pharmacy Services¹⁵

Measure Domain	Indicator	Caveats
Accuracy of Documentation	Proportion of electronic patient profiles that contain prescription information that is inaccurate when compared to the original prescription	For pharmacies receiving hard-copy prescriptions, this could entail a daily comparison of a sample of prescriptions to the patient profile.
Dispensing error	Proportion of prescription medications dispensed to patients wherein the dispensed medication had at least one of the following problems: <ul style="list-style-type: none"> - given to wrong patient - inappropriate medication - inappropriate dose - inappropriate dosage form - inappropriate instructions for use - inappropriate use of warning labels 	In this indicator, the term 'inappropriate' could mean a product or instructions that do not conform to the physician's prescription, or that have a significant potential to cause harm to the patient.
Clinical management	Number of clinical interventions per pharmacist per month Proportion of clinical interventions that were accepted by the prescriber and/or patient	A list of eligible clinical interventions should be created, and reports should provide a breakdown by category of intervention
Medication information	Proportion of patients receiving a new medication who report that they were not provided the opportunity to talk with a pharmacist about the medication Proportion of patients who were satisfied with the clarity, timeliness and depth of information provided by the pharmacist Proportion of patients with at least one target condition who received a comprehensive medication record from the pharmacy at least annually	Standardized questionnaires should be developed to improve the comparability of information across pharmacies or over time within a pharmacy.
Mis-timed refills	Proportion of patients using asthma controller medications who had did not obtain another dispensing of a controller medication within 5 days beyond the 'days supply' of the prior dispensing (i.e., a five-day gap in therapy) Proportion of patients who obtain > 2 canisters of short-acting beta2-agonist medication within a 50-day period, and who did not receive a clinical intervention by a pharmacist	Indicators could also be developed to identify poor adherence to target drugs for other chronic diseases. This indicator identifies patients with poorly controlled asthma, but will require exclusion of patients who obtain additional inhalers for storage in multiple locations.
Follow-up to medication initiation	Proportion of patients who obtain a new prescription for an antidepressant medication and who do not	Indicators could be developed for other disease states where

¹⁵ Safe and Effective? MacKinnon NJ, ed. Canadian Pharmacists Association, Ottawa, ON; in production (to be published Jan 2007).

	receive follow-up communication from a pharmacist, or other health professional, within seven days of the first dispensing	discontinuation of the drug soon after initiation is common.
--	--	--