

CHCS

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FACES OF MEDICAID
DATA SERIES

Multimorbidity Pattern Analyses and Clinical Opportunities: *Hypertension*

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This set of tables is part of the analysis, *Clarifying Multimorbidity to Improve Targeting and Delivery of Clinical Services for Medicaid Populations*, which was undertaken by the Center for Health Care Strategies and The Johns Hopkins University School of Medicine and Bloomberg School of Public Health to help policymakers identify intervention strategies with the potential to both improve quality and reduce costs for Medicaid beneficiaries with multiple chronic conditions. For the full report, visit www.chcs.org.

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*The **Center for Health Care Strategies (CHCS)** is a nonprofit health policy resource center dedicated to improving health care quality for low-income children and adults, people with chronic illnesses and disabilities, frail elders, and racially and ethnically diverse populations experiencing disparities in care. CHCS works with state and federal agencies, health plans, providers and consumer groups to develop innovative programs that better serve Medicaid beneficiaries with complex and high-cost health care needs. Its program priorities are: enhancing access to coverage and services; improving quality and reducing racial and ethnic disparities; integrating care for people with complex and special needs; and building Medicaid leadership and capacity.*

Overview

This set of tables is part of the *Faces of Medicaid* analysis, *Clarifying Multimorbidity to Improve Targeting and Delivery of Clinical Services for Medicaid Populations*, undertaken by the Center for Health Care Strategies (CHCS) and The Johns Hopkins University School of Medicine and Bloomberg School of Public Health. The analysis sought to help policymakers identify intervention strategies with the potential to both improve quality and reduce costs for adult Medicaid beneficiaries with multiple chronic conditions.

The following tables summarize multimorbidity data on hypertension for adult Medicaid-only beneficiaries with disabilities under the age of 65 and inventory potential clinical opportunities for addressing multimorbidity associated with hypertension. For this analysis, “multimorbidity patterns” are defined as the specific and often multiple conditions that a person has (e.g., a person with depression, hypertension, chronic pain, and asthma), as opposed to a simple tally of the number of conditions that someone has (e.g., a person with five chronic conditions). The tables are intended to aid policymakers in identifying subgroups of Medicaid beneficiaries who stand to benefit from targeted care management and tailoring interventions to improve health outcomes and reduce costs. Contents include:

1. **Multimorbidity Summary Table (Table 1):** This table lists the five most costly patterns of multimorbidity (based on total annual costs, excluding long-term care expenditures) for hypertension. These data can be used to help prioritize care management opportunities to improve outcomes and control costs. Prevalence, costs, and hospitalization rates are summarized for:
 - Beneficiaries who *only* have the specific hypertension pattern, without additional comorbidities.
 - Beneficiaries who have the specific hypertension pattern *plus* potentially other comorbidities. In other words, all individuals represented in this group have the conditions specified in the stated multimorbidity pattern, but any individual may have other conditions as well. This broader approach has a greater likelihood of capturing all individuals with hypertension and the identified comorbidities in the population.
2. **Multimorbidity Pattern Table (Table 2):** This table details the 16 most prevalent multimorbidity patterns for hypertension, including prevalence, cost, and hospitalization data for each. Data include beneficiaries who *only* have the specific conditions in each multimorbidity pattern.
3. **Clinical Opportunities Table (Table 3):** A series of literature searches was conducted for the multimorbidity patterns that the analysis identified as high-priority opportunities from a prevalence, clinical, and cost perspective. In addition to presenting actionable, clinical opportunities for Medicaid stakeholders responsible for care management program design, these clinical opportunities tables also help identify gaps in knowledge around clinical management of these conditions. Literature is categorized as follows:
 - Clinical “pearls” that offer recommendations relevant to an aspect of care for individuals with the specified multimorbidity pattern;
 - Single disease-specific models that address processes important to caring for individuals with multimorbidity, such as care coordination and medication management;
 - Relevant clinical practice guidelines and systematic reviews; and
 - Evidence-based models for the specific multimorbidity pattern.

Table 1: Hypertension Multimorbidity Summary

This table lists the five most costly patterns of multimorbidity -- based on total annual costs, excluding long-term care expenditures -- for hypertension. These data can be used to help prioritize care management opportunities to improve outcomes and control costs.

Medicaid-Only Adult Beneficiaries with Disabilities, Under Age 65

Multimorbidity Pattern		Prevalence among beneficiaries with hypertension	Prevalence among overall population	Per capita cost	Percent of total annual costs among beneficiaries with hypertension	Percent of total annual costs among overall population	Per capita hospitalizations
Hypertension							
1	+ Psychiatric Disorders	5.61%	1.67%	\$7,244	2.99%	1.14%	0.11
		64.58%	19.21%	\$16,245	77.04%	29.47%	0.86
2	Hypertension only (no comorbidities among conditions considered)	6.91%	2.06%	\$3,680	1.87%	0.71%	0.07
		100.00%	29.75%	\$13,618	100.00%	38.25%	0.71
3	+ Psychiatric Disorders, Diabetes	2.42%	0.72%	\$8,811	1.57%	0.60%	0.17
		23.54%	7.00%	\$19,907	34.41%	13.16%	1.13
4	+ Psychiatric Disorders, Schizophrenia	1.37%	0.41%	\$13,504	1.36%	0.52%	0.36
		9.01%	2.68%	\$23,341	15.44%	5.91%	1.45
5	+ Diabetes	3.00%	0.89%	\$5,290	1.16%	0.45%	0.13
		35.95%	10.70%	\$16,986	44.84%	17.15%	0.94

Co-occurring conditions that were considered include: Depressive disorders, hypertension, coronary heart disease, asthma and/or chronic obstructive pulmonary disease, back or spine disorders, antipsychotic or mood stabilizer drugs, drug and alcohol disorders, diabetes, anxiety disorder or benzodiazepam use, congestive heart failure, hepatitis or chronic liver disease, stroke, prednisone use, dizziness, gastrointestinal bleed, anticoagulation drugs (warfarin), chronic renal failure/end stage renal disease, HIV or AIDS, and personality disorders.

KEY

- Beneficiaries with only hypertension and the specified multimorbidity pattern (no other comorbidities).
- Beneficiaries with hypertension, the specified multimorbidity pattern, and potentially other additional comorbidities, varying by individual.

Table 2: Hypertension Multimorbidity Patterns

This table presents the 16 most prevalent co-occurring conditions for hypertension (columns in the left half), and prevalence, hospitalization, and cost data for each pattern (columns in the right half). These data reveal patterns that are prime for targeted interventions across a number of variables of interest, including population prevalence, per capita costs, and annual hospitalization rates. For each pattern, these variables are calculated for individuals who have the specified conditions and no other comorbidities. The condition columns are ordered from most prevalent (left) to least prevalent (right) in the hypertension population. A checkmark represents the presence of the specified condition. Unless noted, all cost estimates exclude long-term care costs.

Medicaid-Only Adult Beneficiaries with Disabilities, Under Age 65

Hypertension +													Pattern Prevalence, % ¹	Cumulative Prevalence, %	Annual Hospitalization Rate Per Capita	Per Capita Costs, excl. Long-term Care	% Total Annual Costs, excl. Long-term Care ²	Cumulative % of Total Annual Costs, excl. Long-term Care	% Total Annual Long-term Care Costs	Very High-Cost Prevalence, % ³	High-Cost Prevalence, % ⁴
Psychiatric disorders	Coronary heart disease	Diabetes	Asthma and/or chronic obstructive pulmonary disease	Back or spine disorders	Congestive heart failure	Drug and alcohol disorders	Chronic pain	Stroke	Dizziness	Chronic renal failure/end stage renal disease	Schizophrenia	Developmental disorders									
													6.91%	6.91%	0.07	\$3,680	1.87%	1.87%	2.46%	0.54%	2.98%
✓													5.61%	12.52%	0.11	\$7,244	2.99%	4.85%	3.71%	1.00%	9.22%
		✓											3.00%	15.52%	0.13	\$5,290	1.16%	6.02%	0.92%	0.82%	5.91%
✓		✓											2.42%	17.94%	0.17	\$8,811	1.57%	7.58%	1.52%	1.66%	15.12%
✓	✓												1.95%	19.89%	0.24	\$7,683	1.10%	8.69%	0.93%	1.56%	11.98%
✓				✓									1.90%	21.79%	0.10	\$6,415	0.90%	9.58%	0.44%	1.08%	8.68%
	✓												1.85%	23.64%	0.21	\$5,021	0.68%	10.26%	0.55%	1.02%	6.68%
✓				✓			✓						1.43%	25.07%	0.23	\$9,440	0.99%	11.25%	0.43%	3.10%	19.01%
✓											✓		1.37%	26.44%	0.36	\$13,504	1.36%	12.61%	2.00%	4.72%	28.10%
				✓									1.36%	27.81%	0.06	\$3,505	0.35%	12.96%	0.19%	0.35%	2.61%
✓			✓										1.29%	29.09%	0.22	\$8,786	0.83%	13.79%	0.73%	1.77%	16.43%
			✓										1.21%	30.30%	0.17	\$5,223	0.46%	14.26%	0.35%	1.13%	6.55%
✓	✓	✓											1.18%	31.48%	0.39	\$10,386	0.90%	15.16%	0.76%	3.07%	22.22%
✓	✓			✓									1.18%	32.66%	0.21	\$7,625	0.66%	15.82%	0.33%	1.18%	12.91%
	✓	✓											1.14%	33.81%	0.34	\$7,971	0.67%	16.49%	0.41%	2.36%	13.18%
✓							✓						1.11%	34.92%	0.33	\$10,812	0.88%	17.37%	0.79%	4.58%	17.97%

KEY

- Index condition with no comorbidity in identified conditions.
- Patterns with the top three highest total annual costs.
- Patterns with the top three highest annual hospitalization rates.
- Patterns with the top three high cost prevalence rates.

¹ Prevalence of this pattern among beneficiaries with hypertension.
² \$7.6 billion, excluding Long-Term Care costs, was spent by Medicaid on 559,056 disabled Medicaid-only beneficiaries with hypertension. Results are presented for the top 16 out of 4,053 total patterns observed for people with hypertension.
³ The proportion of beneficiaries with this specific multimorbidity pattern who are represented among beneficiaries in the top 1st to 5th percentile of costs in the overall population of Medicaid-only adult beneficiaries with disabilities.
⁴ The proportion of beneficiaries with this specific multimorbidity pattern who are represented among beneficiaries in the top 5.01st to 20th percentile of costs in the overall population of Medicaid-only adult beneficiaries with disabilities.

Table 3: Hypertension Clinical Opportunities

The following table inventories evidence-based models of care for hypertension and associated multimorbid patterns, including references published since 2000. This resource provides an actionable complement to the multimorbidity cost and prevalence data presented earlier. It is intended to guide Medicaid stakeholders in tailoring implementation strategies to improve care for beneficiaries with these multimorbidity patterns.

A bibliography of full citations alphabetized by author is available at www.chcs.org.

Clinical pearl for specific multimorbidity pattern	Single-disease focused clinical care delivery model for multimorbid patients	Clinical practice guidelines or systematic review for multimorbidity pattern	Model for specific multimorbidity pattern
Hypertension + Psychiatric Disorders			
Schoenthaler 2009. Self-efficacy mediates the relationship between depressive symptoms and medication adherence among hypertensive African-Americans.	Gensichen 2009. Randomized trial of case management for depression by healthcare assistant in small primary care practices. Demonstrated reduction in depression symptoms.	Von Muenster 2008. Describes pharmacist interventions during physician-pharmacist co-management of hypertension. Could be applied to patients with multimorbidity.	Bogner 2008. Randomized trial of integrated care intervention for depression and hypertension. Demonstrated improved depression and hypertension outcomes.
Wagner 2008. Among hypertensives, psychological disorders related to mood, anxiety, or personality are associated with increased health service utilization.	Bao 2009. Evidence-based depression care management in primary care in older patients. Demonstrated increased utilization of antidepressants, adequate doses and duration of therapy.		
	Unutzer 2002. Describes first report from IMPACT trial of collaborative care management for late-life depression. Multiple studies demonstrating positive effects on depression outcomes as well as outcomes related to other comorbid conditions.		
	Von Muenster 2008. Describes pharmacist interventions during physician-pharmacist co-management of hypertension. Could be applied to patients with multimorbidity.		
	Canzanello 2005. Describes physician-nurse team model to improve long-term hypertension control rates by active intervention and home blood pressure measurement. Positive results.		
	Carter 2009. Meta-analysis of team-based care intervention for hypertension. Positive results.		

Clinical pearl for specific multimorbidity pattern	Single-disease focused clinical care delivery model for multimorbid patients	Clinical practice guidelines or systematic review for multimorbidity pattern	Model for specific multimorbidity pattern
Hypertension + Schizophrenia			
Correll 2008. Second generation antipsychotics have equal effects on development of metabolic syndrome in schizophrenics and patients with bipolar disorder.		Cohn 2006. Review of consensus guidelines for metabolic monitoring of patients treated with antipsychotic medications.	Schneiderhan 2009. Describes a point-of-care metabolic risk assessment screening program in outpatients receiving antipsychotics. Screening included blood pressure, glucose, personal knowledge, and other modifiable risk factors.
Millar 2008. Underscores importance of mental health providers to perform assessments aimed at physical assessment including blood pressure.	Von Muenster 2008. See above.		
Jacob 2008. Discusses medical comorbidity in schizophrenia including hypertension. Provides framework for assessment, monitoring, and management.	Canzanello 2005. See above.		Guideline from Royal Australian and New Zealand College of Psychiatry recommends attention is paid to hypertension in setting of pharmacologic treatment of schizophrenia.
Nasrallah 2006. Baseline data from CATIE study highlights high rate of non-treatment (62.4%) of hypertension among schizophrenics.	Carter 2009. See above.		
	Bruce 2007. Depression assessment in home health care led to appropriate referral and care.		
Hypertension + Diabetes Mellitus			
Mancia 2007. Review of optimal control of blood pressure in patients with diabetes and effects on macro and microvascular events.	Von Muenster 2008. See above.	Borzecki 2005. Review of approaches to co-management of hypertension and diabetes.	Planas 2009. Hypertension medication therapy management program in patients with diabetes in managed care settings resulted in better hypertension control.
Weir 2009. Review of the SANDS trial and benefits of aggressive versus standard blood pressure control in diabetics.	Canzanello 2005. See above.	Zanchetti 2002. Review of issues related to hypertension control in diabetes. Highlights importance of control and use of ACE inhibitors.	Bebb 2007. Describes randomized trial of treatment algorithm for hypertension in patients with diabetes. Intervention was ineffective.
Bolen 2008. Study of failure to intensify antihypertensive treatment among diabetics. Discusses potential ways to improve.	Carter 2009. See above.	Reboldi 2009. Review of optimal combination therapy in patients with diabetes and hypertension.	Tobe 2006. Describes effect of nurse-directed intervention of hypertension treatment among patients with existing hypertension and diabetes. Effective intervention.
Duggirala 2005. Identifies predictors of poor blood pressure control among diabetic hypertensives in primary care setting.	West 2007. Motivational interviewing improves weight loss.	Giovanni 2005. Cochrane evaluation of comparative effectiveness of antihypertensive agents in patient with diabetes and mormoalbunimuria. ACE endorsed.	McLean 2008. Randomized trial of community pharmacist and nurse to improve hypertension management in patients with diabetes. Effective intervention.
Kerr 2008. Clinical uncertainty of patient's true blood pressure in diabetics often limits physician ability to augment antihypertensive therapy.		Strippoli 2006. Only ACE at maximum tolerable doses have been shown to decrease overall mortality.	Sanders 2002. Chart-based reminder systems for patients with hypertension and diabetes failed to improve physician compliance with clinical guideline for hypertension management in diabetes.

Clinical pearl for specific multimorbidity pattern	Single-disease focused clinical care delivery model for multimorbid patients	Clinical practice guidelines or systematic review for multimorbidity pattern	Model for specific multimorbidity pattern
Hypertension + Diabetes Mellitus (continued)			
Pellegrini 2003. Structural and organizational factors will influence quality of care for hypertensive diabetics.		Cochrane, 2005. ACE-I reduce the incidence of proteinuria.	Andros 2006. Describes use of pharmacy claims at a managed care organization to assess degree of hypertensive control among diabetics.
Praet, 2008. Simple brisk walking programs can be as effective as individualized exercise.		Arauz-Pacheco, 2002. ACE-I, ARB, betablockers and distal tubule diuretics are first-line agents for treatment of HTN.	Choe 2008. Describes effect of multidisciplinary team to achieve optimal hypertension control in diabetics. Positive effect.
DPPR Group, 2006. Older adults are more responsive to behavioral interventions, less responsive to metformin, compared to young.			
Hypertension + Coronary Heart Disease			
Ho 2008. Retrospective cohort study suggests that non-adherence is major factor in poor blood pressure control among patients with coronary heart disease.	Von Muenster 2008. See above.	Williams 2002. AHA Scientific Statement on secondary prevention of coronary heart disease. Discusses issues related to hypertension, including management.	
	Canzanello 2005. See above.	British Cardiac Society and British Hypertension Society 2000. A joint recommendation on prevention of coronary heart disease in clinical practice.	
	Carter 2009. See above.		
Hypertension + Developmental Disorders			
McDermott 2006, 2007. Certain disabilities may be associated with the presence of specific comorbid conditions. This was not the case for hypertension.	Von Muenster 2008. See above.		
	Canzanello 2005. See above.		
	Carter 2009. See above.		