Managing Multiple Chronic Conditions (MCC)

AARP: Chronic Conditions Among Older Americans

Chronic Disease Self-Management Program

> The Chronic Disease Self-Management Program is a workshop given two and a half hours, once a week, for six weeks, in community settings such as senior centers, churches, libraries and hospitals. People with different chronic health problems attend together. Workshops are facilitated by two trained leaders, one or both of whom are non-health professionals with chronic diseases themselves.

Exercise & Physical Activity: Your Everyday Guide from the National Institute on Aging

> Welcome to *Exercise & Physical Activity: Your Everyday Guide from the National Institute on Aging!* The National Institute on Aging (NIA) is part of the National Institutes of Health, and the goal of our research is to improve the health and well-being of older adults.

Multiple Chronic Conditions: A Day in the Life

> "Multiple Chronic Conditions: A Day in the Life" centers around the experiences of Mae, a woman with multiple chronic conditions. Beginning at home with her family, we follow Mae as she visits one health care provider after another, struggling to keep track of the various instructions, treatments, and prescriptions she receives – all while trying to maintain a balanced life.

National Council on Aging: Chronic Disease Management

> Every day, millions of people with chronic diseases struggle to manage their symptoms. About 80% of older adults have at least one chronic disease, and 68% have at least two. Chronic diseases place a significant burden on individuals as well as health care systems. The good news is that people with chronic diseases who learn how to manage their symptoms can improve their quality of life and reduce their health care costs.

USDHHS, HRSA – Education and Training Resources on Multiple Chronic Conditions (MCC)

> Multiple chronic conditions (MCC) pose a significant and increasing burden on the health of Americans. As part of its efforts to reduce the burden and suffering from MCC, the US Department of Health and Human Services (HHS) supports a large number of programs to prevent and manage multiple chronic conditions MCC. HHS also provides leadership for improving the health of individuals with MCC.

Research and Review Articles

American Geriatrics Society Expert Panel on the Care of Older Adults with Multimorbidity. Guiding principles for the care of older adults with multimorbidity: an approach for clinicians. J Am Geriatr Soc. 2012 Oct;60(10):E1-25.

If you have difficulty accessing any of these resources, please email catch-on@rush.edu.

Boult C, Wieland GD. [Comprehensive primary care for older patients with multiple chronic conditions: "Nobody rushes you through".](#) JAMA 2010; 304:1936.

> Older patients with multiple chronic health conditions and complex health care needs often receive care that is fragmented, incomplete, inefficient, and ineffective. This article describes the case of an older woman whose case cannot be managed effectively through the customary approach of simply diagnosing and treating her individual diseases. Based on expert consensus about the available evidence, this article identifies 4 proactive, continuous processes that can substantially improve the primary care of community-dwelling older patients who have multiple chronic conditions: comprehensive assessment, evidence-based care planning and monitoring, promotion of patients' and (family caregivers') active engagement in care, and coordination of professionals in care of the patient--all tailored to the patient's goals and preferences. Three models of chronic care that include these processes and that appear to improve some aspects of the effectiveness and the efficiency of complex primary care--the Geriatric Resources for Assessment and Care of Elders (GRACE) model, Guided Care, and the Program of All-inclusive Care for the Elderly (PACE)--are described briefly, and steps toward their implementation are discussed.

Boyd CM, Darer J, Boult C, et al. [Clinical practice guidelines and quality of care for older patients with multiple comorbid diseases: implications for pay for performance.](#) JAMA 2005; 294:716.

> CONTEXT: Clinical practice guidelines (CPGs) have been developed to improve the quality of health care for many chronic conditions. Pay-for-performance initiatives assess physician adherence to interventions that may reflect CPG recommendations. OBJECTIVE: To evaluate the applicability of CPGs to the care of older individuals with several comorbid diseases. DATA SOURCES: The National Health Interview Survey and a nationally representative sample of Medicare beneficiaries (to identify the most prevalent chronic diseases in this population); the National Guideline Clearinghouse (for locating evidence-based CPGs for each chronic disease). STUDY SELECTION: Of the 15 most common chronic diseases, we selected hypertension, chronic heart failure, stable angina, atrial fibrillation, hypercholesterolemia, diabetes mellitus, osteoarthritis, chronic obstructive pulmonary disease, and osteoporosis, which are usually managed in primary care, choosing CPGs promulgated by national and international medical organizations for each. DATA EXTRACTION: Two investigators independently assessed whether each CPG addressed older patients with multiple comorbid diseases, goals of treatment, interactions between recommendations, burden to patients and caregivers, patient preferences, life expectancy, and quality of life. Differences were resolved by consensus. For a hypothetical 79-year-old woman with chronic obstructive pulmonary disease, type 2 diabetes, osteoporosis, hypertension, and osteoarthritis, we aggregated the recommendations from the relevant CPGs. DATA SYNTHESIS: Most CPGs did not modify or discuss the applicability of their recommendations for older patients with multiple comorbidities. Most also did not comment on burden, short- and long-term goals, and the quality of the underlying scientific evidence, nor give guidance for incorporating patient preferences into treatment plans. If the relevant CPGs were followed, the hypothetical patient would be prescribed 12 medications (costing her 406 dollars per month) and a complicated nonpharmacological regimen. Adverse interactions between drugs and diseases could

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result. CONCLUSIONS: This review suggests that adhering to current CPGs in caring for an older person with several comorbidities may have undesirable effects. Basing standards for quality of care and pay for performance on existing CPGs could lead to inappropriate judgment of the care provided to older individuals with complex comorbidities and could create perverse incentives that emphasize the wrong aspects of care for this population and diminish the quality of their care. Developing measures of the quality of the care needed by older patients with complex comorbidities is critical to improving their care.

Fortin M, Hudon C, Haggerty J, et al. [Prevalence estimates of multimobidity: a comparative study of two sources.](#) BMC Health Services research 2010;10:111.

BACKGROUND: Published prevalence studies on multimorbidity present diverse data collection methods, sources of data, targeted age groups, diagnoses considered and study populations, making the comparability of prevalence estimates questionable. The objective of this study was to compare prevalence estimates of multimorbidity derived from two sources and to examine the impact of the number of diagnoses considered in the measurement of multimorbidity. METHODS: Prevalence of multimorbidity was estimated in adults over 25 years of age from two separate Canadian studies: a 2005 survey of 26,000 respondents randomly selected from the general population and a 2003 study of 980 patients from 21 family practices. We estimated the prevalence of multimorbidity based on the co-occurrence of ≥ 2 and ≥ 3 diseases of the seven diseases listed in the general population survey. For primary care patients, we also estimated multimorbidity prevalence using an open list of chronic diseases. RESULTS: Prevalence estimates were considerably higher for each age group in the primary care sample than in the general population. For primary care patients, the number of chronic diseases considered for estimates resulted in large differences, especially in younger age groups. The prevalence of multimorbidity increased with age in both study populations. CONCLUSIONS: The prevalence of multimorbidity was substantially lower when estimated in a general population than in a family practice-based sample and was higher when the number of conditions considered increased.

Fried TR, Tinetti M, Iannone L. [Primary Care Clinicians' experiences with treatment decision making for older adults with multiple conditions.](#) Arch Intern Med 2011;171(1):75-80.

BACKGROUND: Clinicians are caring for an increasing number of older patients with multiple diseases in the face of uncertainty concerning the benefits and harms associated with guideline-directed interventions. Understanding how primary care clinicians approach treatment decision-making for these patients is critical to the design of interventions to improve the decision-making process. METHODS: Focus groups were conducted with 40 primary care clinicians (physicians, nurse practitioners, and physician assistants) in academic, community, and Veterans Affairs-affiliated primary care practices. Participants were given open-ended questions about their approach to treatment decision making for older persons with multiple medical conditions. Responses were organized into themes using qualitative content analysis.

RESULTS: The participants were concerned about their patients' ability to adhere to complex regimens derived from guideline-directed care. There was variability in beliefs regarding, and approaches to balancing, the benefits and harms of guideline-directed care. There was also variability regarding how the participants involved patients in the process of decision making, with clinicians describing conflicts between their own and their patients' goals. The participants listed a number of barriers to making good treatment decisions, including the lack of outcome data, the role of specialists, patient and family expectations, and insufficient time and reimbursement. CONCLUSIONS: The experiences of practicing clinicians suggest that they struggle with the uncertainties of applying disease-specific guidelines to their older patients with multiple conditions. To improve decision making, they need more data, alternative guidelines, approaches to reconciling their own and their patients' priorities, the support of their subspecialist colleagues, and an altered reimbursement system.

Global Burden of Disease Study 2013 Collaborators. [Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries](). 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet 2015; 386:743.

BACKGROUND: Up-to-date evidence about levels and trends in disease and injury incidence, prevalence, and years lived with disability (YLDs) is an essential input into global, regional, and national health policies. In the Global Burden of Disease Study 2013 (GBD 2013), we estimated these quantities for acute and chronic diseases and injuries for 188 countries between 1990 and 2013. METHODS: Estimates were calculated for disease and injury incidence, prevalence, and YLDs using GBD 2010 methods with some important refinements. Results for incidence of acute disorders and prevalence of chronic disorders are new additions to the analysis. Key improvements include expansion to the cause and sequelae list, updated systematic reviews, use of detailed injury codes, improvements to the Bayesian meta-regression method (DisMod-MR), and use of severity splits for various causes. An index of data representativeness, showing data availability, was calculated for each cause and impairment during three periods globally and at the country level for 2013. In total, 35 620 distinct sources of data were used and documented to calculated estimates for 301 diseases and injuries and 2337 sequelae. The comorbidity simulation provides estimates for the number of sequelae, concurrently, by individuals by country, year, age, and sex. Disability weights were updated with the addition of new population-based survey data from four countries. FINDINGS: Disease and injury were highly prevalent; only a small fraction of individuals had no sequelae. Comorbidity rose substantially with age and in absolute terms from 1990 to 2013. Incidence of acute sequelae were predominantly infectious diseases and short-term injuries, with over 2 billion cases of upper respiratory infections and diarrhoeal disease episodes in 2013, with the notable exception of tooth pain due to permanent caries with more than 200 million incident cases in 2013. Conversely, leading chronic sequelae were largely attributable to non-communicable diseases, with prevalence estimates for asymptomatic permanent caries and tension-type headache of 2·4 billion and 1·6 billion, respectively. The distribution of the number of sequelae in populations varied widely across regions, with an expected relation between age and disease

prevalence. YLDs for both sexes increased from 537·6 million in 1990 to 764·8 million in 2013 due to population growth and ageing, whereas the age-standardised rate decreased little from 114·87 per 1000 people to 110·31 per 1000 people between 1990 and 2013. Leading causes of YLDs included low back pain and major depressive disorder among the top ten causes of YLDs in every country. YLD rates per person, by major cause groups, indicated the main drivers of increases were due to musculoskeletal, mental, and substance use disorders, neurological disorders, and chronic respiratory diseases; however HIV/AIDS was a notable driver of increasing YLDs in sub-Saharan Africa. Also, the proportion of disability-adjusted life years due to YLDs increased globally from 21·1% in 1990 to 31·2% in 2013. INTERPRETATION: Ageing of the world's population is leading to a substantial increase in the numbers of individuals with sequelae of diseases and injuries. Rates of YLDs are declining much more slowly than mortality rates. The non-fatal dimensions of disease and injury will require more and more attention from health systems. The transition to non-fatal outcomes as the dominant source of burden of disease is occurring rapidly outside of sub-Saharan Africa. Our results can guide future health initiatives through examination of epidemiological trends and a better understanding of variation across countries.

Hajjar ER, Cafiero AC, Hanlon JT. [Polypharmacy in Elderly Patients](). Am J Geriatr Pharmacother 2007;5:345-51.

BACKGROUND: Polypharmacy (ie, the use of multiple medications and/or the administration of more medications than are clinically indicated, representing unnecessary drug use) is common among the elderly. OBJECTIVE: The goal of this research was to provide a description of observational studies examining the epidemiology of polypharmacy and to review randomized controlled studies that have been published in the past 2 decades designed to reduce polypharmacy in older adults. METHODS: Materials for this review were gathered from a search of the MEDLINE database (1986-June 2007) and International Pharmaceutical Abstracts (1986-June 2007) to identify articles in people aged >65 years. We used a combination of the following search terms: polypharmacy, multiple medications, polymedicine, elderly, geriatric, and aged. A manual search of the reference lists from identified articles and the authors' article files, book chapters, and recent reviews was conducted to identify additional articles. From these, the authors identified those studies that measured polypharmacy. RESULTS: The literature review found that polypharmacy continues to increase and is a known risk factor for important morbidity and mortality. There are few rigorously designed intervention studies that have been shown to reduce unnecessary polypharmacy in older adults. The literature review identified 5 articles, which are included here. All studies showed an improvement in polypharmacy. CONCLUSIONS: Many studies have found that various numbers of medications are associated with negative health outcomes, but more research is needed to further delineate the consequences associated with unnecessary drug use in elderly patients. Health care professionals should be aware of the risks and fully evaluate all medications at each patient visit to prevent polypharmacy from occurring.

Holmes HM, Min LC, Yee M, et al. [Rationalizing prescribing for older patients with multimorbidity: considering time to benefit](). Drugs Aging 2013; 30:655.

Given the growing number of older adults with multimorbidity who are prescribed multiple medications, clinicians need to prioritize which medications are most likely to benefit and least likely to harm an individual patient. The concept of time to benefit (TTB) is increasingly discussed in addition to other measures of drug effectiveness in order to understand and contextualize the benefits and harms of a therapy to an individual patient. However, how to glean this information from available evidence is not well established. The lack of such information for clinicians highlights a critical need in the design and reporting of clinical trials to provide information most relevant to decision making for older adults with multimorbidity. We define TTB as the time until a statistically significant benefit is observed in trials of people taking a therapy compared to a control group not taking the therapy. Similarly, time to harm (TTH) is the time until a statistically significant adverse effect is seen in a trial for the treatment group compared to the control group. To determine both TTB and TTH, it is critical that we also clearly define the benefit or harm under consideration. Well-defined benefits or harms are clinically meaningful, measurable outcomes that are desired (or shunned) by patients. In this conceptual review, we illustrate concepts of TTB in randomized controlled trials (RCTs) of statins for the primary prevention of cardiovascular disease. Using published results, we estimate probable TTB for statins with the future goal of using such information to improve prescribing decisions for individual patients. Knowing the relative TTBs and TTHs associated with a patient's medications could be immensely useful to a clinician in decision making for their older patients with multimorbidity. We describe the challenges in defining and determining TTB and TTH, and discuss possible ways of analyzing and reporting trial results that would add more information about this aspect of drug effectiveness to the clinician's evidence base.

Osborn R, Moulds D, Schneider EC, et al. Primary care physicians in ten countries report challenges caring for patients with complex health needs. Health Affairs 2015:34(12):2104-12.
Industrialized countries face a daunting challenge in providing high-quality care for aging patients with increasingly complex health care needs who will need ongoing chronic care management, community, and social services in addition to episodic acute care. Our international survey of primary care doctors in the United States and nine other countries reveals their concern about how well prepared their practices are to manage the care of patients with complex needs and about their variable experiences in coordinating care and communicating with specialists, hospitals, home care, and social service providers. While electronic information exchange remains a challenge in most countries, a positive finding was the significant increase in the adoption of electronic health records by primary care doctors in the United States and Canada since 2012. Finally, feedback on job-related stress, perceptions of declining quality of care, and administrative burden signal the need to monitor front-line perspectives as health reforms are conceived and implemented.

Parekh AK, Barton MB. The challenge of multiple comorbidity for the US Health Care System. JAMA 2010;303(13):1303-4.

Smith SM, Soubhi H, Fortin M, et al. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. Cochrane Database Syst Rev 2012; 4:CD006560.

BACKGROUND: Many people with chronic disease have more than one chronic condition, which is referred to as multimorbidity. While this is not a new phenomenon, there is greater recognition of its impact and the importance of improving outcomes for individuals affected. Research in the area to date has focused mainly on descriptive epidemiology and impact assessment. There has been limited exploration of the effectiveness of interventions for multimorbidity. OBJECTIVES: To determine the effectiveness of interventions designed to improve outcomes in patients with multimorbidity in primary care and community settings. Multimorbidity was defined as two or more chronic conditions in the same individual. SEARCH METHODS: We searched MEDLINE, EMBASE, CINAHL, CAB Health, AMED, HealthStar, The Cochrane Central Register of Controlled Trials (CENTRAL), the EPOC Register and the Database of Abstracts of Reviews of Effectiveness (DARE), and the EPOC Register in April 2011. SELECTION CRITERIA: We considered randomised controlled trials (RCTs), controlled clinical trials (CCTs), controlled before and after studies (CBAs), and interrupted time series analyses (ITS) reporting on interventions to improve outcomes for people with multimorbidity in primary care and community settings. The outcomes included any validated measure of physical or mental health, psychosocial status including quality of life outcomes, well-being, and measures of disability or functional status. We also included measures of patient and provider behaviour including measures of medication adherence, utilisation of health services, and acceptability of services and costs. DATA COLLECTION AND ANALYSIS: Two review authors independently assessed studies for eligibility, extracted data, and assessed study quality. Meta-analysis of results was not possible so we carried out a narrative synthesis of the results from the included studies. MAIN RESULTS: Ten studies examining a range of complex interventions for patients with multimorbidity were identified. All were RCTs and there was low risk of bias. Two of the nine studies focused on specific co-morbidities. The remaining studies focused on multimorbidity, generally in older patients. All studies involved complex interventions with multiple elements. In six of the ten studies, the predominant intervention element was a change to the organisation of care delivery, usually through case management or enhanced multidisciplinary team work. In the remaining four studies, the interventions were predominantly patient oriented. Overall the results were mixed with a trend towards improved prescribing and medication adherence. The results indicate that it is difficult to improve outcomes in this population but that interventions focusing on particular risk factors or functional difficulties in patients with co-morbid conditions or multimorbidity may be more effective. Cost data were limited with no economic analyses included, though the improvements in prescribing and risk factor management in some studies provided potentially significant cost savings. AUTHORS' CONCLUSIONS: This review highlights the paucity of research into interventions to improve outcomes for multimorbidity with the focus to date being on co-morbid conditions or multimorbidity in older patients. The limited results suggest that interventions to date have had mixed effects but have shown a tendency to improve prescribing and medication adherence, particularly if interventions can be targeted at risk factors or specific functional difficulties in people with co-morbid conditions

or multimorbidity. There is a need for clear definitions of participants, consideration of appropriate outcomes, and further pragmatic studies based in primary care settings.

Wagner EH. Chronic disease management: what will it take to improve care for chronic illness? Eff Clin Pract 1998; 1:2.

Wolf JL, Starfield B, Anderson G. Prevalence, Expenditures and complications of multiple chronic conditions in the Elderly. Arch Intern Med 2002;162:2269-76.

BACKGROUND: The prevalence, health care expenditures, and hospitalization experiences are important considerations among elderly populations with multiple chronic conditions. METHODS: A cross-sectional analysis was conducted on a nationally random sample of 1 217 103 Medicare fee-for-service beneficiaries aged 65 and older living in the United States and enrolled in both Medicare Part A and Medicare Part B during 1999. Multiple logistic regression was used to analyze the influence of age, sex, and number of types of chronic conditions on the risk of incurring inpatient hospitalizations for ambulatory care sensitive conditions and hospitalizations with preventable complications among aged Medicare beneficiaries. RESULTS: In 1999, 82% of aged Medicare beneficiaries had 1 or more chronic conditions, and 65% had multiple chronic conditions. Inpatient admissions for ambulatory care sensitive conditions and hospitalizations with preventable complications increased with the number of chronic conditions. For example, Medicare beneficiaries with 4 or more chronic conditions were 99 times more likely than a beneficiary without any chronic conditions to have an admission for an ambulatory care sensitive condition (95% confidence interval, 86-113). Per capita Medicare expenditures increased with the number of types of chronic conditions from $211 among beneficiaries without a chronic condition to $13 973 among beneficiaries with 4 or more types of chronic conditions. CONCLUSIONS: The risk of an avoidable inpatient admission or a preventable complication in an inpatient setting increases dramatically with the number of chronic conditions. Better primary care, especially coordination of care, could reduce avoidable hospitalization rates, especially for individuals with multiple chronic conditions.

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