

# The Population Care Coordination Process

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## ABSTRACT

**Purpose/Objectives:** The purpose of the article was to outline a population-based approach to providing care coordination. The Population Care Coordination Process provides a framework for each provider and/or organization to provide multilevel care based on population- and patient-centered principles.

**Primary Practice Setting:** The Population Care Coordination Process is scalable. It can be utilized in a smaller scale such as single provider office or in a larger scale such as an accountable care organization.

**Findings/Conclusions:** There are many issues within our current health care structure that must be addressed. Care coordination has been identified as a potential solution to address the needs of complex patients within the system. The expansion to consider populations allows for a more targeted and efficient approach.

**Implications For Case Management Practice:** The population care process entails a data-driven approach to care coordination. The inclusion of populations in the care coordination process provides an opportunity to maximize efforts and improve outcomes.

**Key words:** *care coordination, case management, populations, process model*

The U.S. health care system has been characterized by health disparities, rising costs, fragmentation, clinical errors, lack of communication between providers, an emphasis on emergent issues at the expense of preventive care, and poorer outcomes compared to other countries (Betancourt, Corbett, & Bondaryk, 2014; Davis, Stremikis, Squires, & Schoen, 2014; Fani Marvasti & Stafford, 2012; Institute of Medicine, 1999, 2000; Rice et al., 2013). Care coordination has been shown to improve the quality and safety of health services and to decrease utilization of emergency departments services and costs (American Nurses Association, 2012). If implemented nationally, an improved care coordination system could save up to \$240.1 billion per year (Owens, 2010). As an example, patients and families may fail to follow up on primary care referrals to specialists (Forrest, Shadmi, Nutting, & Starfield, 2007). To improve continuity of patient care, care coordinators could assist those patients and families to determine barriers to follow up and identify solutions to overcome those barriers. The American Academy of Pediatrics (2014), American Nurses Association (2012), Institute of Health Care Improvement (Craig, Eby, & Whittington, 2011), and well as Institute of Medicine (2000, 2003) have recognized that care coordination could contribute to addressing the challenges of the U.S. health care system.

## POPULATION HEALTH APPROACH

To optimize health system performance, the Institute for Healthcare Improvement (IHI) developed a framework with a population-level approach, with which care coordination can align (IHI, 2015). The IHI's Triple Aim framework focuses on improving the individual's experience of care and the overall health of the population, while reducing per capita costs, by involving patients/families, redesigning services, managing the health of populations, integrating systems, and strengthening financial management (Berwick, Nolan, & Whittington, 2008).

A "population" is defined as "a group of individuals, in contrast to the individuals themselves, organized into many different units of analysis, depending on the research or policy purpose" (Kindig, 2007, p. 142). A population health perspective looks beyond a biomedical model of individual health and allows providers to consider what makes some groups of people healthier than other groups of people (Young, 2004). For example, the

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neighborhoods in which we live and access health care, our social and community context, education, and economic stability all influence our health (Healthy People 2020, 2015). These determinants of health, in combination with biomedical factors, are part of a population health approach. The four goals of population health are:

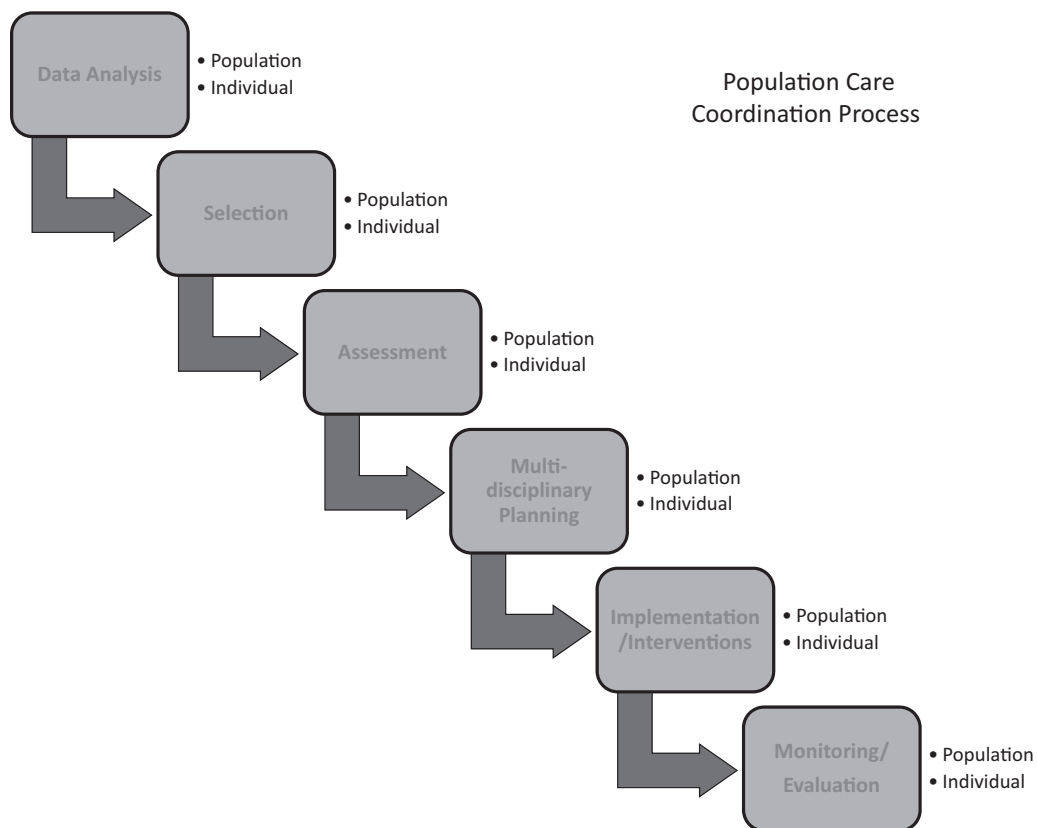
- Reduce the need for illness services by focusing on prevention.
- Decrease the demand for illness services by utilizing education interventions and providing decision making support for patients.
- Better usage of available resources, including those in the community.
- Improve delivery of services through utilization of available evidence, quality improvement,

and collaboration. (Horvath & Pomeranz, 2013)

These goals are an integral part of both the interventions and implementation phases of the Population Care Coordination Process.

## THE POPULATION CARE COORDINATION PROCESS

The Population Care Coordination Process utilizes principles from care coordination, case management, and population health to maximize health outcomes and resource utilization for populations and the individuals within them. The process focuses on coordinating care for the entire population, followed by an individualization of that care. Two primary strategies may be to (1) address the needs of high-risk subpopulations within a larger assigned populations through targeted programs, care plans, or protocols; or (2) target a specific aspect of care coordination that will benefit an entire assigned population, such as improving primary prevention interventions. The Population Care Coordination Process involves six phases: data analysis, selection, assessment, planning, interventions, and evaluation (see Figure 1). While the process is generally linear, steps can be repeated as necessary particularly if additional information, assessment, or analysis is required.



**FIGURE 1**

The Population Care Coordination Process. A diagram of the Population Care Coordination Process outlines the six step of the process. These steps include data analysis, selection, assessment, planning, interventions and monitoring. These steps are completed at the population and individual levels.

## Data Analysis and Selection

The first step requires a comprehensive analysis of available data related to the assigned population, which may be an entire organization or a subset thereof. Such data may include medical records (electronic or hard copy), registries, laboratory data banks, administrative data banks, utilization (pharmacy, emergency room, hospitalization, etc.) data from payers or any other sources of practice or organizational data. Typical analysis questions may include: How many people are affected by a specific disease such as congestive heart failure or diabetes? How well are chronic diseases controlled? How does the organization handle transitions of care? What is the readmission rate following a particular procedure or admission diagnosis? What are the metrics of our organization in relation to local and national benchmarks? The goal of the analysis is to determine what are the assigned population's unique needs and problems, specifically those most at risk for loss of life, most at risk for complications, the overall needs of the population, the modifiability of the most high-risk needs, and the comparability of the assigned population to local, state, or national benchmarks. The specific questions asked of the data will depend on the organization and population of interest.

The criteria and logistics for inclusion of individuals in the subpopulation should be carefully considered. How will members of the subpopulation be screened and flagged as distinct from the overall population? Which variables are most appropriate to identify the subpopulation of interest? In particular, is there a searchable electronic record? Will a member of the team be required and responsible for reviewing paper charts and setting up a registry? Will the subpopulation members need to self-identify with a screening tool?

## Assessment

Once the high-risk group(s) is specified and members of the subpopulation of interest are identified, a full assessment of their status and needs is the third phase of the process. Assessment should focus on the individual, organizational, community, state, and federal levels. Also, a multidisciplinary approach, in which each discipline brings unique assessment skills and together provides a more holistic view of the subpopulation's needs and problems, will ensure that vital information is available for the planning and intervention phases. For example, if your subpopulation consists of those who live rurally, then perspectives of both a primary care provider and a social worker will be required to assess a population at high risk for access issues (Goins, Williams, Carter, Spencer, & Solovieva, 2005).

A comprehensive assessment defines the problems and needs specific to the target subpopulation(s). In general, high-risk patients will have multiple problems and needs that require attention and prioritization.

## Planning

Once the information has been gathered related to the identified needs and problems, the planning phase begins by making decision about how to address the issues. An initial step is to articulate goals for the subpopulation, which focuses the care team on the desired target for the subpopulation. Goals should follow logically from the data, problems, and needs and be identified collaboratively. They should be focused on improvement of the entire subpopulation's health and/or office practices. They may either be written in terms of specific numeric targets for improvement or be directional in terms of desired trends. The subpopulation may require more than one goal per problem or need, depending on their complexity.

While goal setting may provide guidance during the planning, implementation, and evaluation phases; there are other logistics to consider during planning. One logistical consideration is where the final care plan documents will reside (hard copy vs. electronic). Communication methods related to the care plan also need to be carefully considered especially related to urgent communication. Will communication occur via electronic medical record (EMR), secured e-mail, conferences, or phone calls, etc.? Team members should define their individual roles and responsibilities to facilitate accountability. Some responsibilities will be clear; for example, diagnosis and treatment plans clearly fall to the physicians and mid-level practitioners just as planning for mobility issues is largely a role of physical therapists. Even with clear divisions, the roles and responsibilities require clear delineation. Responsibilities that lack clarity will need to be assigned on the basis of availability of

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team disciplines, group dynamics, and legal considerations, such as scope of practice.

### **Interventions**

In the fifth phase, the team considers interventions to address the problems, goals, and needs of the subpopulation. Interventions should be evidence-based and/or best practice. The interventions should target the comprehensive needs of the subpopulation. They will generally fall into three distinct and interrelated categories: prevention, transitions of care, and chronic care. Potential modifications of subpopulation interventions may be necessary to maintain a patient-centered focus for individual patients and should be factored into the subpopulation planning. Modifiers might include language, literacy, and/or culture as examples. In addition, a population approach requires consideration of all determinants of health and a variety of interventions, including but not limited to health promotion, disease prevention, behavior modification, and chronic disease management (Nash, Reifsnyder, Fabius, & Pracilio, 2011).

Prevention focuses on avoidance of disease, early recognition of disease, and deterrence of injury (Nash et al., 2011). For example, if your practice data indicated that patients are not compliant with evidence-based guidelines on cancer screening, then this suggests the need for an intervention aimed at prevention. Prevention interventions might focus on lifestyle behavior change, given that 40% of premature deaths are linked to unhealthy behaviors, such as smoking, excessive drinking, increased body mass index, lack of physical activity, illicit substance use, and risky sexual behaviors (Schroeder, 2012). Interventions that target never smoking, following a healthy diet, exercising and consuming only moderate alcohol can have a significant impact on the overall health of a population and decrease risk of all-cause mortality, cancer, and cardiovascular disease (Ford, Zhao, Tsai, & Li, 2011). By including prevention-related interventions for the subpopulation, there is the potential to decrease risk of developing co-morbid conditions or progression of chronic disease.

Patients who are transitioning from acute care are at risk for adverse events, such as adverse drug events, insufficient follow-up, and hospital readmissions (Forster, Murff, Peterson, Gandhi, & Bates, 2003; Kripalani, Theobald, Anctil, & Vasilevskis, 2014). Root causes of transitions of care issues have been identified as multiple areas such as communication, patient education, accountability, lack of timely follow-up, insufficient community support, and lack of addressing ongoing issue (Li, Young, & Williams, 2014; The Joint Commission, 2012). Care coordination during transitions of care can address some of the root causes of such problems as lack of communication related to shared medical information and lack of timely follow-up with primary care provider (Burton, 2012). Medication discrepancies, self-care issues, and lack of social support should be the focus of interventions during transitions of care (Kripalani, Jackson, Schnipper, & Coleman, 2007). The Population Care Coordination Process can help the health care team improve transitions of care by addressing the root causes of errors as they relate to the specific population and circumstances.

Chronic illnesses affect almost half of the adult U.S. population, and 25% have more than one chronic illness (Ward, Schiller, & Goodman, 2013). The U.S. Department of Health and Human Services (USDHHS, 2010) outlined a strategy for addressing multiple chronic illnesses, which includes addressing system issues, utilizing of self-management by individual patients with adequate support, providing tools and resources for providers, and focusing research efforts on multimorbidity.

System issues can be addressed at many levels. The federal government has looked for means of addressing chronic care. Specifically, as of 2014, Medicare reimburses for care coordination for recipients with two or more chronic illnesses, based on specific current procedural terminology codes (Edwards & Landon, 2014; Lewis, 2013). Another example would be the U.S. Food and Drug Administration (2014), which now requires the calorie information be available to the public for fast-food restaurant chains as well as in vending machines for operators who own/operate more than 20 machines. A system change through policy could potentially benefit patients who are trying to reduce their weight to improve their chronic health conditions. In the private sector, innovations to manage chronic care and improve access to care have emerged, such as the establishment of retail clinics in pharmacy chains (Costello, 2008). An intraorganizational intervention might be to change patient flow through a system to enhance a patient's experience or outcomes.

Self-management is a major focus for chronic care interventions and was the second recommendation

of the USDHHS (2010). Self-management refers to “the ability of the individual, in conjunction with family, community, and health care professionals, to manage symptoms, treatments, lifestyle changes, and psychosocial, cultural, and spiritual consequences of health conditions” (Richardson et al., 2014, p. 261). In particular, Schulman-Green et al. (2012), on the basis of their meta-analysis, identified three processes that are critical to self-management: understanding and focusing on illness, identifying and activating appropriate resources, and coping/adjusting to life with chronic disease. While care coordinators can make frequent contact with these high-risk patients, patients are still responsible for managing their own care the majority of the time that they are at home. Patients with chronic illness and particularly those with more than one chronic condition require instruction and support to self-manage, which care coordinators can provide.

Tools that enable providers to deliver chronic care was the third recommendation of USDHHS (2010). Education and training tools should be available to ensure that providers have comprehensive knowledge of the effects of multiple diseases as well as multiple treatments on an individual patient (Parekh, Kronick, & Tavenner, 2014). Evidence-based guidelines should be updated regularly to guide care of individual disease and multimorbid states in the context of the population’s community (Moskowitz & Bodenheimer, 2011). Finally, team structures and clinical information systems with decisions support are necessary tools for providers who care for populations with chronic illness (Wagner, 2011).

The final recommendation of USDHHS (2010) related to chronic care is ongoing research. Ongoing evaluation of research findings is critical for providers to understand how patients address and deal with multimorbid conditions on a daily basis. A research agenda for multimorbidity, its definition, effects across the lifespan, interventions, and measures has been proposed by the Society for Academic Primary Care and Scottish School of Primary Care (Mercer,

Smith, Wyke, O’Dowd, & Watt, 2009). In addition, USDHHS (2010) proposed research on increasing external validity of trials, estimating the incidence and prevalence of multimorbidity, studying the impact of patient’s health over time, and investigating health disparities. Interventions during the Population Care Coordination Process should focus on addressing systemwide issues, self-management training and support, review and location tools, and evaluating research from a population and individual perspective.

## Evaluation

The final step in the Population Care Coordination Process is evaluation. Given that the purpose of the Population Care Coordination Process is to improve patient outcomes, the process must revisit data analysis again. How will you determine progress toward goals? How will you determine compliance with your subpopulation care coordination process? It is important that these metrics directly measure what you intend them to measure. In addition, the measurement tools selected should be deemed reliable and valid prior to use. Measures can be found at the National Quality Forum, Centers for Medicare & Medicaid Services, Agency for Healthcare Research and Quality, The Joint Commission, as well as several professional organizations (Agency for Healthcare Research and Quality, 2014; American Nurses Association, 2012; Centers for Medicare & Medicaid Services, 2015; National Committee for Quality Assurance, n.d.; National Quality Forum, 2012; The Joint Commission, 2015).

After data are collected and analyzed and statistics reviewed, the team must decide what the next steps are. What do the data tell them? Has sufficient progress been made toward goals? Do the goals need to be updated or modified? What changes need to be made to the care plan or office practices to reach the original or modified goals? Should the care plan be continued with or without modification to the interventions?

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## Individualization

Once the team has created a subpopulation care plan with all problems, needs (common and data-driven), goals, interventions, and measures in place, it is time to consider the individual members within the subpopulation. To be most effective, the entire care coordination process must be repeated for each member. Each individual's care plan should be patient-centered and address the individual's needs, problems, and barriers to care. Each patient may have many if not all of the problems and needs identified for the subpopulation. However, some patients' needs and problems may be unique. The individual patient's holistic needs, including language, culture, literacy, personal goals, psychosocial needs, and medical needs, should be taken into consideration for the care plan to be effective.

## A POPULATION CASE EXAMPLE

An example demonstrates how the Population Case Coordination Process might be applied. Suppose you are working as a care coordinator in a family practice, which is a Patient Centered Medical Home. In the analysis phase, you would review the practice's EMR and registry data and conclude that your asthmatic patients are your highest risk subpopulation, based on the number of patients involved, the severity of disease, and frequency of utilization.

A comprehensive assessment of the asthmatic subpopulation members should include demographics, social determinants of health, ability to self-manage, severity of disease, asthma knowledge, medication adherence, asthma triggers, etc. What do the aggregated data of the subpopulation reveal in terms of patterns or commonalities? Is there evidence of adherence to established evidence-based guidelines on asthma and documentation of deviations, existing referral processes, models of care, and office practices? In the larger community, what are the existing local, state, and federal laws and other relevant factors related to the environment, health policy, community resources, school resources, educational programs, materials, or access to care of asthmatic patients? The two most pressing problems identified by the team might be lack of knowledge related to asthma and lack of recommended primary care follow-up on the part of the patient.

In the planning phase, the care team might set a numerical goal for education of a 20% increase in the number of subpopulation members who were correctly able to identify their asthma triggers. A directional goal for the lack of follow-up might be that there will be an increase in the percentage of the subpopulation, who received follow-up care at the

recommended time. The team might choose to implement the care plan within the EMR. The communication route would also be secure e-mail with phone calls for urgent concerns. The roles and responsibilities of each team member should be included.

When developing interventions for an asthmatic subpopulation, the care team should develop a list of options available to providers interacting with asthmatic patients over time. In practice, all interventions related to asthma management should be included, but for this example only a sample of interventions related to the two problems will be included (see Table 1). The plan could include specific modifications or adjustments to each intervention that may arise as the plan is implemented for subpopulation members. If you have a large number of patients who speak Russian in your population, you might include educational materials in Russian. Another example might relate to community specifics, such as the development and dissemination of a list of local restaurants that allow smoking, so that asthmatic patients are able to avoid a known trigger.

The next step requires evaluation of the process. Change in knowledge level of asthmatic patients might be evaluated with the Asthma Knowledge Questionnaire for Consumers (Kritikos, Krass, Chan, & Bosnic-Anticevich, 2005). The questionnaire could be administered prior to a specific educational intervention, then again after the intervention to assess for improvement. The results of each subpopulation member's scores should be aggregated to see how the entire subpopulation has changed. To assess improvement in the percentage of the asthma-affected subpopulation who attended scheduled follow-up appointments, the team could focus on measuring the number of patients who attended a follow-up appointment (based on documentation) divided by the total number in subpopulation who had a recommended follow-up appointment.

As mentioned previously, the process should be repeated for each patient. This is a process with which most care coordinators are familiar. In brief, care coordinators gather data on the patient, select what aspects make him or her high-risk, assess for problems and needs, plan care, implement interventions, and evaluate. Some key steps for individualization will be the assessment, care planning, and implementation. As with the population, assessment of an individual patient is a critical step. Most patients will come with more than one comorbid condition that will need to be factored into the care plan. In addition, unique circumstances need to be considered. For example, if a patient has low

**TABLE 1**  
**Sample Asthmatic Subpopulation Interventions**

<b>Problem Addressed With Goal</b>	<b>Subpopulation Interventions</b>
<b>P = problem</b>	
<b>G-goal</b>	
P: Knowledge deficit	Literacy assessment
G: The subpopulation will have an increase in their knowledge related to asthma.	<ul style="list-style-type: none"> <li>Review of literacy assessment tools</li> <li>Select health literacy tool for use in practice</li> <li>Assessment of asthma knowledge               <ul style="list-style-type: none"> <li>Review options for asthma knowledge assessment</li> <li>Select option to use</li> </ul> </li> <li>Assessment of available educational programs</li> <li>Review of available evidence</li> <li>Evidence-based programs available through               <ul style="list-style-type: none"> <li>Professional organizations</li> <li>Government</li> <li>Local</li> </ul> </li> <li>Implementation of selected formal asthma education program including disease process, symptoms, triggers, management, medications, nebulizers, peak flow meters, action plans</li> <li>Delivery formats:               <ul style="list-style-type: none"> <li>One on one</li> <li>Group education courses</li> <li>Written materials</li> <li>Videos</li> <li>Referral to existing community educational program</li> </ul> </li> <li>Community resource referral               <ul style="list-style-type: none"> <li>Health Insurance Portability and Accountability Act (HIPAA) approved process</li> <li>School programs if member is a student</li> </ul> </li> </ul>
P: Lack of follow-up	Assessment of barriers
G: The percentage of the subpopulation who attends scheduled follow-up appointments will increase.	<ul style="list-style-type: none"> <li>Unable to get off work to get to appointment</li> <li>Transportation</li> <li>Cost</li> <li>Forgetting appointments</li> <li>Redesign office practices               <ul style="list-style-type: none"> <li>Create a formal procedure for addressing follow-up</li> <li>Extend hours</li> <li>Reminder phone calls</li> </ul> </li> <li>Social work consult               <ul style="list-style-type: none"> <li>Transportation arrangements (make a list of options)</li> <li>Insurance (Department of Social Services Referral when appropriate; review of benefits)</li> <li>Childcare</li> <li>Social determinants</li> </ul> </li> </ul>

literacy, then educational interventions will need to be modified with materials written at appropriate literacy level or provided in their preferred learning style. In terms of care planning, the patient and family should be fully involved to ensure a patient-centered approach.

## **IMPLEMENTATION OF THE POPULATION CARE COORDINATION PROCESS**

The Population Care Coordination Process has broad applicability to many care settings spanning from a primary care clinical to a specialty clinic or from a

single practice to a more complex system such as an accountable care organization. While a full discussion on implementation is beyond the scope of this article, there are a few items to consider. The scale to be implemented is important. Will the organization start small with one subpopulation and expand, or will the entire population served be included? What is the long-term plan for scale? An organization also will need to decide who will assume the role of the care coordinator. Most commonly, it is a case manager, social worker, or nurse with case management experience. However, registered nurses, nurse practitioners, physician assistants, and physicians also may assume the role with training. Will care coordinators implement the process as part of their existing responsibilities, or does a new role need to be created within the organization?

The ability to collect and analyze data also should be considered. Is a searchable EMR available (and interlinked for larger organizations)? Will registries need to be created first or an EMR purchased? A final consideration is the degree to which the organization wants to be interlinked with other members of the system as whole. This may include partnering with members of the medical neighborhood, community organizations, or payers.

## CONCLUSION

Population care coordination is a complex process that seeks to improve health outcomes of both populations and individuals simultaneously. The steps of the process are outlined, but it can be tailored to meet the needs of any population and its members. This is important because, while there are similarities among populations within our health care systems, many elements are unique to communities or organizations. The Population Care Coordination Process allows for both a population-centered and patient-centered approach, while meeting the needs of each.

## REFERENCES

- Agency for Healthcare Research and Quality. (2014, October). *Care coordination*. Retrieved January 11, 2014, 2014, from <http://www.ahrq.gov/professionals/prevention-chronic-care/improve/coordination/>
- American Academy of Pediatrics. (2014). Patient- and family-centered care coordination: A framework for integrating care for children and youth across multiple systems. *Pediatrics*, *133*(5), e1451–e1460. doi: 10.1542/peds.2014-0318
- American Nurses Association. (2012). *The value of nursing care coordination: A white paper of the American Nurses Association*. Retrieved from <http://www.nursingworld.org/carecoordinationwhitepaper>
- Berwick, D. M., Nolan, T. W., & Whittington, J. (2008). The triple aim: care, health, and cost. *Health Affairs (Millwood)*, *27*(3), 759–769. doi: 10.1377/hlthaff.27.3.759
- Betancourt, J. R., Corbett, J., & Bondaryk, M. R. (2014). Addressing disparities and achieving equity: Cultural competence, ethics, and health-care transformation. *Chest*, *145*(1), 143–148. doi: 10.1378/chest.13-0634
- Burton, R. (2012). Improving care transitions. *Health Affairs [Health Policy Brief]*. Retrieved from [http://www.healthaffairs.org/healthpolicybriefs/brief.php?brief\\_id=76](http://www.healthaffairs.org/healthpolicybriefs/brief.php?brief_id=76).
- Centers for Medicare & Medicaid Services. (2015). *Quality measures and performance standards*. Retrieved February 5, 2015, from [http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Quality\\_Measures\\_Standards.html](http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Quality_Measures_Standards.html)
- Costello, D. (2008). A checkup for retail medicine. *Health Affairs (Millwood)*, *27*(5), 1299–1303. doi: 10.1377/hlthaff.27.5.1299
- Craig, C., Eby, D., & Whittington, J. (2011). *Care coordination model: Better care at lower cost for people with multiple health and social needs*. Cambridge, MA: Institute for Healthcare Improvement.
- Davis, K., Stremikis, K., Squires, D., & Schoen, C. (2014). *Mirror, mirror on the wall: How the performance of the U.S. health care system compares internationally* (pp. 32). Washington, DC: The Commonwealth Fund.
- Edwards, S. T., & Landon, B. E. (2014). Medicare's chronic care management payment–payment reform for primary care. *The New England Journal of Medicine*, *371*(22), 2049–2051. doi: 10.1056/NEJMp1410790
- Fani Marvasti, F., & Stafford, R. S. (2012). From sick care to health care—reengineering prevention into the U.S. system. *The New England Journal of Medicine*, *367*(10), 889–891. doi: 10.1056/NEJMp1206230
- Ford, E. S., Zhao, G., Tsai, J., & Li, C. (2011). Low-risk lifestyle behaviors and all-cause mortality: Findings from the National Health and Nutrition Examination Survey III Mortality Study. *American Journal of Public Health*, *101*(10), 1922–1929. doi: 10.2105//ajph.2011.30016710.2105/ajph.2011.300167
- Forrest, C. B., Shadmi, E., Nutting, P. A., & Starfield, B. (2007). Specialty referral completion among primary care patients: Results from the ASPN Referral Study. *Annals of Family Medicine*, *5*(4), 361–367. doi: 10.1370/afm.703
- Forster, A. J., Murff, H. J., Peterson, J. F., Gandhi, T. K., & Bates, D. W. (2003). The incidence and severity of adverse events affecting patients after discharge from the hospital. *Annals of Internal Medicine*, *138*(3), 161–167.
- Goins, R. T., Williams, K. A., Carter, M. W., Spencer, M., & Solovieva, T. (2005). Perceived barriers to health care access among rural older adults: A qualitative study. *The Journal of Rural Health*, *21*(3), 206–213.
- Healthy People 2020. (2015, January 10). *Social determinants of health*. Retrieved January 11, 2015, from <http://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health>
- Horvath, T. V., & Pomeranz, H. (2013). Chapter 41: Population-based health. In R. Ballweg, E. M. Sullivan, D. Brown, & D. Vetrosky (Eds.), *Physician assistant: A guide to clinical practice* (5th ed.). Philadelphia, PA: Elsevier, Saunders.
- Institute for Healthcare Improvement. (2015). *The IHI triple aim*. Retrieved February 4, 2015, from <http://www.ihl.org/engage/initiatives/TripleAim/Pages/default.aspx>



- Institute of Medicine. (1999). *To err is human: Building a safer health system*. Washington, DC: National Academies Press.
- Institute of Medicine. (2000). *Crossing the quality chasm: A new health system for the 21st century*. Washington, DC: Institute of Medicine.
- Institute of Medicine. (2003). In K. Adams, & J. M. Corrigan (Eds.), *Priority areas for national action: Transforming health care quality*. Washington, DC: National Academies Press (US) Copyright 2003 by the National Academy of Sciences.
- Kindig, D. A. (2007). Understanding population health terminology. *Milbank Quarterly*, 85(1), 139–161. doi: 10.1111/j.1468-0009.2007.00479.x
- Kripalani, S., Jackson, A. T., Schnipper, J. L., & Coleman, E. A. (2007). Promoting effective transitions of care at hospital discharge: A review of key issues for hospitalists. *Journal of Hospital Medicine*, 2(5), 314–323. doi: 10.1002/jhm.228
- Kripalani, S., Theobald, C. N., Anctil, B., & Vasilevskis, E. (2014). Reducing hospital readmission rates: Current strategies and future directions. *Annual Review of Medicine*, 65, 471–485. doi: 10.1146/annurev-med-022613-090415
- Kritikos, V., Krass, I., Chan, H. S., & Bosnic-Anticevich, S. Z. (2005). The validity and reliability of two asthma knowledge questionnaires. *The Journal of Asthma*, 42(9), 795–801. doi: 10.1080/02770900500308627
- Lewis, M. (2013). How to get paid for complex care coordination. *Medical Economics*, 90(6), 51.
- Li, J., Young, R., & Williams, M. V. (2014). Optimizing transitions of care to reduce rehospitalizations. *Cleveland Clinic Journal of Medicine*, 81(5), 312–320. doi: 10.3949/ccjm.81a.13106
- Mercer, S. W., Smith, S. M., Wyke, S., O'Dowd, T., & Watt, G. C. (2009). Multimorbidity in primary care: Developing the research agenda. *Family Practice*, 26(2), 79–80. doi: 10.1093/fampra/cmp020
- Moskowitz, D., & Bodenheimer, T. (2011). Moving from evidence-based medicine to evidence-based health. *Journal of General Internal Medicine*, 26(6), 658–660. doi: 10.1007/s11606-010-1606-4
- Nash, D. B., Reifsnnyder, J., Fabius, R. J., & Pracilio, V. P. (2011). *Population health: Creating a culture of wellness*. Sudbury, MD: Jones & Bartlett Learning.
- National Committee for Quality Assurance. (n.d.). *HEDIS and performance measurement*. Retrieved February 6, 2015, from <http://www.ncqa.org/HEDISQualityMeasurement.aspx>
- National Quality Forum. (2012). *NQF endorses care coordination measures*. Retrieved February 4, 2015, from [http://www.qualityforum.org/News\\_And\\_Resources/Press\\_Releases/2012/NQF\\_Endorses\\_Care\\_Coordination\\_Measures.aspx](http://www.qualityforum.org/News_And_Resources/Press_Releases/2012/NQF_Endorses_Care_Coordination_Measures.aspx)
- Owens, M. K. (2010). Costs of uncoordinated care. In P. L. Yong, R. S. Saunders, & L. A. Olsen (Eds.), *The healthcare imperative: Lowering costs and improving outcomes: Workshop series summary* (pp. 131–140). Washington, DC: National Academies Press.
- Parekh, A. K., Kronick, R., & Tavenner, M. (2014). Optimizing health for persons with multiple chronic conditions. *JAMA*, 312(12), 1199–1200. doi: 10.1001/jama.2014.10181
- Rice, T., Rosenau, P., Unruh, L. Y., Barnes, A. J., Saltman, R. B., & van Ginneken, E. (2013). United States of America: Health system review. *Health System in Transition*, 15(3), 1–431.
- Richardson, J., Loyola-Sanchez, A., Sinclair, S., Harris, J., Letts, L., Macintyre, N. J., ... Martin Ginis, K. (2014). Self-management interventions for chronic disease: A systematic scoping review. *Clin Rehabil*. doi: 10.1177/0269215514532478
- Schroeder, S. A. (2012). Chapter 5: Socioeconomic issues in medicine. In: *Goldman's Cecil medicine* (24th ed.). Philadelphia, PA: Saunders.
- Schulman-Green, D., Jaser, S., Martin, F., Alonzo, A., Grey, M., McCorkle, R., & Whittemore, R. (2012). Processes of self-management in chronic illness. *Journal of Nursing Scholarship*, 44(2), 136–144. doi: 10.1111/j.1547-5069.2012.01444.x
- The Joint Commission. (2012). *Transitions of care: The need for a more effective approach to continuing patient care*. Retrieved January 2015, from [http://www.jointcommission.org/assets/1/18/hot\\_topics\\_transitions\\_of\\_care.pdf](http://www.jointcommission.org/assets/1/18/hot_topics_transitions_of_care.pdf)
- The Joint Commission. (2015). *Core measures sets*. Retrieved February 6, 2015, from [http://www.jointcommission.org/core\\_measure\\_sets.aspx](http://www.jointcommission.org/core_measure_sets.aspx)
- U.S. Department of Health and Human Services. (2010). *Multiple chronic conditions: A strategic framework. Optimum health and quality of life for individuals with multiple chronic conditions*. Washington, DC: Author.
- U.S. Food and Drug Administration. (2014, December 2). *Menu and vending machines labeling requirements*. Retrieved February 10, 2015, from <http://www.fda.gov/Food/IngredientsPackagingLabeling/LabelingNutrition/ucm217762.htm>
- Wagner, E. H. (2011). Chapter 12: Comprehensive chronic disease management. In: *Goldman's Cecil medicine* (24th ed.). St. Louis, MO: Saunders.
- Ward, B. W., Schiller, J. S., & Goodman, R. A. (2013). Multiple chronic conditions among US adults: A 2012 update. *Preventing Chronic Disease*, 11, E62.
- Young, T. K. (2004). *Population health: Concepts and methods* (2nd ed.). New York, NY: Oxford University Press.

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