

Section 3.7 Design

Technology Tools and Optimization for CCC

This tool describes a variety of technology tools and how they may be optimally used to support a community-based care coordination (CCC) program.

Time needed: 3 hours

Suggested other tools: Resource Checklist for CCC; Approaches to Patient Communications; Remote Patient Monitoring; Workflow and Process Analysis/ Redesign/ Optimization for CCC tool suite

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How to Use

1. **Review** the contents of this tool to understand and assess what technology exists today and how it may be used or modified for use in a community-based care coordination (CCC) program.
2. **Actively engage** the CCC program steering committee in any discussions surrounding new technology adoption in order to represent CCC program needs and considerations.
3. **Recognize** that not all the desired technology may yet be available; but, using the checklists included in this tool, determine what technology is available to the CCC program now and what is needed, and begin to explore options for addressing the technology needs.
4. **Ensure optimal** use by reviewing associated workflows, refreshing training, and sharing tips with other users.

Overview of Technology for CCC

Technology for a community-based care coordination (CCC) program is evolving rapidly. Some technology is “tried-and-true” while some might be classified as experimental or “not yet ready for prime time.” In considering which technology to use, the CCC program must consider both their capacity to support the technology and patients’ ability to use them. One should not assume, however, that newer technologies are more difficult to learn to use. In fact, many new technologies applicable to a CCC program have been made very simple to use. Barriers to adopting newer technologies more frequently lie within the healthcare system, whose legacy architectures, budget, or staff may not be able to support the new technologies.

Classes of Technology for CCC

To make it easier to understand and select technology for a CCC program, some technologies are sufficiently unique and are included in separate tools within the CCC Toolkit, or in other Toolkits available at: <http://www.stratishealth.org/expertise/healthit/index.html>.

This tool describes:

- Customer relationship management software
- Directories
- Patient communications
- Health information exchange
- Electronic health records
- Registries
- Data analytics

Technologies addressed more in-depth in a separate tool include:

- Patient action plans
- Personal health record
- Remote patient monitoring

Customer Relationship Management (CRM)

CRM software helps manage a company’s interactions with current and future customers. One may not think about using CRM software in a healthcare environment; however, care coordination is all about tracking and addressing patient (i.e., “customer”) needs. Unless there is registry software available to help track patient needs, CRM software is a good option to consider.

Use the following checklist to identify what CRM functions you need, and whether these are available to you via software that already exists in your CCC program, available in healthcare software you are contemplating acquiring, or whether CRM software might be a potential solution. Note that the terms commonly used in CRM software are used to describe the functionality, and, as applicable, descriptions that translate generic CRM functions into those needed in a CCC program are provided.

CRM Functionality Checklist

Functionality	Already available (Identify software, e.g., MS Outlook)	Other software being considered (e.g., Registry)	Consideration for CRM software (Y/N)
Appointment scheduling Used to schedule CCC calls/visits, set up recurring CCC calls, track appointments patient has with providers/community resources, etc.	<input type="checkbox"/>	<input type="checkbox"/>	
Relationship management Tracks types of contacts needed with patients, identifies patient communication needs and preferences, links preferred specialists and community resources to patients, documents results of contacts, triggers contacts based on documented needs	<input type="checkbox"/>	<input type="checkbox"/>	
Opportunity management/forecasting May support risk stratification as patient needs change in order to change frequency/nature of contacts with patients	<input type="checkbox"/>	<input type="checkbox"/>	
Technology utilization May link to an automated phone call or other contact center	<input type="checkbox"/>	<input type="checkbox"/>	
Sales force automation Enables care coordinator to scan all new patients in population served that may be candidates for CCC services; aids in initiating patient recruitment calls	<input type="checkbox"/>	<input type="checkbox"/>	
Other Specify other needs, e.g., links to existing email, links to patient portal, links to social media, track key performance indicators for productivity reporting, etc.	<input type="checkbox"/>	<input type="checkbox"/>	

Directories

A *directory* is a tool that provides contact and other information about specific types of resources. More sophisticated directories include links to the contacts' websites. Directories may be limited in scope or as broad as a "telephone book."

The best directory for any given type of project or program is one that includes all resources desired. Ideally it should support personalization, such as the ability to add to and delete contacts and to keep notes – perhaps on the quality, cost, or other information about the resource.

For a CCC program, a good directory might include all of the community's providers, including its physicians, hospitals, nursing homes, home health agencies, ambulance services, dentists, behavioral health specialists, and other provider types as well as all community resources, such

as transportation services, meals-on-wheels, etc. and other useful contacts such as the organizers of the CCC program, vendors who support the CCC program, and others. (See *Resource Checklist for CCC*.)

In general, a CCC program will most likely need to compile its own directory or utilize a set of directories online. For example, a hospital may have a directory of all physicians, and possibly other providers. This would be a good starting point for a CCC program to expand upon.

A few states have vended directories for community services. MinnesotaHelp, for instance, provides the public links to resources within Minnesota for seniors, disabled persons, homeless people, refugees, troubled youths, and others. It also includes links to transportation services, immediate help (e.g., shelter, food, healthcare, financial crisis, etc.), tools about healthcare privacy and security, the Minnesota Department of Health, etc. Available at: <http://www.minnesotahelp.info/public/>

If a CCC program is totally without directory resources or needs to merge several directories, this can generally be done by importing existing directory information into a spreadsheet or database.

The following list identifies the key types of information such a directory should include:

- **Type of resource.** See *Resource Checklist for CCC* for the variety of types of resources to which a CCC program most likely needs access and use these as a starting point for building categories.
- **Contact information**, including name, address, telephone number, fax number, email address, and other applicable demographic information.
 - For providers, it may be desirable to include specialty type.
 - Additional useful information depending on the type of contact may be hours of operation, emergency contact information, geographic distance, cost of services, etc.
- **Link** to the resources' website.
- **Place to put notes.** This may be as simple as a place to type free-form narrative, or may include some categorization of data – such as first contact date, last contact date, personal observations, reports from patients, etc. A rating system might be helpful.

Although a physician's office practice management system (PMS) may have some directory functionality, it typically is limited to the providers in the practice, its patients, and sometimes providers to whom the office typically refers patients. A CCC program working with multiple different types of providers and other community resources will need something less tethered to a given setting and with additional features. An IT staff person or contractor familiar with spreadsheet or database design should be able to help the CCC program build what is needed.

Patient Communications

With respect to technology, patient communications refers to the ability to effectively:

- Conduct phone calls using automated dialing functionality, messaging, etc. Utilize the Internet (Voice over IP (VoIP)) for making low or no cost calls and other messaging with patients
- Conduct email, potentially using a secure portal
- Do instant messaging or text messaging
- Chat online
- Engage in social media
- Directly exchange physiological monitoring information and reminders

Patient communications technology within a CCC program includes both contact management (Who is the population served? What are individual preferences for communications?) and linking contact information with the actual communication connection.

In the context of a CCC program, patient communications technology may also support automated forms of personalized communications. Some of these communications systems may be available directly through a telephone company or Internet Service Provider (ISP); others may be a part of a CRM system, or may be a purchased service from a call center.

Depending on the size of the community served, the types of patient communications technology needs will vary. All CCC programs, however, will benefit from modest communications support.

In order to make use of patient communications technology it may be necessary for CCs to help their patients get low cost or free smart phones through Medicare, Medicaid, and some other insurers. Review current findings about smart phone use in different populations in *Profiles of Medicaid Outreach and Enrollment Strategies: Using Text Messaging to Reach and Enroll Uninsured Individuals into Medicaid and CHIP*, available at: <http://kff.org/medicaid/issue-brief/profiles-of-medicaid-outreach-and-enrollment-strategies-using-text-messaging-to-reach-and-enroll-uninsured-individuals-into-medicaid-and-chip/>. See also the following website on obtaining free government cell phones, at: <http://www.freegovernmentcellphones.net/free-government-cell-phones-expanding-into-internet-smartphones>. Browse the web for “free smartphones” and you will be amazed at the possibilities.

[Note: A study conducted by PwC recently found that Medicaid patients were the most active text-message senders of any class of insured or uninsured, with 79% of Medicaid recipients with phones considered active texters. It also found that many providers and patients are interested in engaging patients and doing physiological monitoring, but only if they do not have to pay for it. However, many providers cited lack of integration with EHRs as a barrier as well. Interestingly, more men than women, and more well patients vs. chronically ill patients, seem interested in using mobile technology to connect with providers. See: <http://www.amednews.com/article/20101004/business/310049963/2/>]

With a cohort of Medicare patients, it is also important to help the patient select a phone that is designed with seniors in mind. These should include apps such as those using Blue Button

technology (see: http://en.wikipedia.org/wiki/The_Blue_Button) to access health information on Medicare, the VA, or Aetna, as well as an increasing number of providers.

Registries

The Agency for Healthcare Research and Quality (AHRQ) defines a registry as

*“An organized system that uses observational study methods to collect uniform data (clinical and other) to evaluate specified outcomes for a population defined by a particular disease, condition, or exposure, and that serves a predetermined scientific, clinical, or policy purpose(s).”*¹

AHRQ also notes that the “registry database” is the file or files derived from the registry. In general, most use “registry” and “registry database” synonymously, including this tool.

Registry vs. Electronic Health Record (EHR)

There are several key differences between a registry and an EHR. These include:

- A registry is generally *external* to any given healthcare organization. There are several reasons for this:
 - A registry used to conduct research needs to have sufficient data about a population that valid research can be performed. Most healthcare organizations will not have the size or diversity of population to support such research.
 - A registry is often used to exchange data with different organizations. For example, an immunization registry is used by providers, schools, and public health departments. A diabetes registry may be used by providers, pharmaceutical manufacturers, and others (with applicable permissions). Such registries generally are created and managed by a state or federal government, research associations, academic medical centers, or vendors.
- A registry is comprised of *data about many different individuals* within a specific population, and this population generally crosses many different healthcare organizations.
 - An EHR is a suite of applications that creates separate files about individuals.
- A registry will only contain a *small subset of all the data about each person* in the specified population.
 - An EHR contains all data about a person that is compiled at one location or within one organizational governance structure. Although the goal has been to achieve a “longitudinal” EHR about a person from “birth to death,” organizational governance structures have precluded this to date.
- A registry is *built on technology that supports analytics*. This means that a registry is easily able to produce lists of certain types of patients. These lists can be used as the basis for recall reminders. Such a registry may be local to the healthcare organization or based in a health information exchange organization (see below). A registry can also be used to mine data about populations of patients, with various sophisticated analysis techniques being applied. Such registries tend to be larger, national or international registries. Clinical research is often conducted using such registry data. Tumor registries, for

example, have existed for many years. They may be tapped, for example, to evaluate the effectiveness of a chemotherapy agent across many patients.

- An EHR is built on technology that supports “transaction processing.” This means that it is really good at entering a lot of data and providing clinical decision support alerts specific to the patient being viewed. It does not do as well in generating lists of all patients, and is not intended to perform analytics across all patients in a population.
- A registry *receives data through a variety of processes*. Some registries derive their data from reports made explicitly to it – such as an immunization registry or tumor registry. There is generally no charge for participating in this type of registry, although there may be a cost associated with acquiring and/or implementing software used to compile and submit data to these registries. Registries may derive their data from claims sent to payers. Quality improvement registries, such as those required by The Joint Commission, Medicare, and others, may support retrieval of data from claims and/or direct entry by the provider organization, such as through a portal or even paper record submission. Many healthcare organizations, however, compile the data needed for submission to such registries (again, using special software to do so) and then pay for a service to “clean” and submit the data to such registries. In this way, potential errors are caught in advance and the service retains the data and can perform analysis on it for more immediate feedback to the healthcare organization and/or for more sophisticated analytics. Users of such registries (e.g., researchers) may pay a fee, and must have appropriate permissions to access the registry data.
 - An EHR is compiled through clinician data entry and from source systems, such as laboratory information systems, radiology information systems, etc.

Registry Functionality in an EHR

Some healthcare organizations use a separate registry service (usually managed by a vendor) to manage populations of their patients. For example, a healthcare organization may submit data to a diabetes registry and receive daily patient recall lists. In order to gain the benefit of the reminder list functionality of a registry without having a separate process, some EHRs have been designed with a limited amount of “registry functionality.” The sophistication of registry functionality in EHRs varies, although is continuously improving.

The following are some registry functions that may be available in an EHR:

- **Produce lists** of specified types of patients, such as all diabetics who need a reminder in the next two weeks that they are due for their HgA1c measurement.
- **Print patient letters, generate an electronic file** for staff to work, or provide for an automated call dialer process (a form of communications technology).
- **Display reminders** at the time a person is accessing a given patient’s record. In some of these, preferences can be set by users, such as a mammography reminder, which will appear when a nurse accesses a patient’s record, and a reminder for depression screening, which will appear when a provider accesses a patient’s record. Workflow

- considerations are important here. Some providers prefer to see preventive screening reminders at the start of a visit, others at the end of the visit. Some providers want their staff to do all preventive screening reminders.

Registry vs. Health Information Exchange (HIE)

Some HIE organizations (HIOs) are providing registry services for their participants. Such a registry may be one that supports an accountable care organization (ACO) or a CCC program. For example, it may provide risk stratification on patients in the population and supply recruitment lists to applicable healthcare organizations. Some of these registries may be used directly by CCs to receive reminders about patient appointments, follow up calls/visits, etc. The registry may house or have associated with it a community resource directory. It is also possible that local registries may be used to submit required data to the Centers for Medicare and Medicaid Services (CMS) for ACOs that are in Medicare Shared Services Plans or other plans required to submit quality data to CMS.

Electronic Health Record Components Related to CCC

As noted above, a directory in a given provider's PMS and registry functionality in a given provider's EHR – as robust as they may be – rarely are able to serve a CCC program fully that is comprised of multiple providers. In this case, the CCC program generally turns to some form of integrated resource, whether home grown or vended, or an HIO that can integrate multiple resources.

However, it is still helpful to appreciate the types of technology tools an EHR should have to support care coordination at the local level. These include:

- ❑ **Patient-specific instruction/education generation** – The ability to give patients educational information about their health condition is a requirement of the federal meaningful use (M.U.) of EHR incentive program. However, EHRs may vary with the extent to which the educational material is personalized, that instructions for multiple care needs are integrated, and have other tailoring functions to meet patient needs (e.g., translation, large-size font, and other accessibility needs). The CC may be able to work with the providers in the CCC program to standardized and improve upon their offerings, especially if there is an HIO that has the ability to support this.
- ❑ **Patient-specific clinical summary generation** – The ability to generate a patient-specific clinical summary is also a requirement of the M.U. program. While there is some standardization for what is included and general formatting, the clinical summary may not include all of the information desired for care coordination. In fact, CCs may wish to work with their community providers to help them determine any additional information needs for both their patients participating in the CCC program and the CC who should also have access to this summary.
- ❑ **Patient-specific action plan generation** – The ability to generate a patient action plan varies with the EHR. In general, this function is much less common than the generation of educational material and clinical summaries. It may be necessary to build this into any CRM, directory spreadsheet/database, or registry being built. (See *Patient Action Plan*.)

- ❑ **Digital dashboards** – A digital dashboard is "an easy to read, often single page, real-time user interface, showing a graphical presentation of the current status (snapshot) and historical trends of an organization's key performance indicators to enable instantaneous and informed decisions to be made at a glance."² These are quite common in either or both PMSs and EHRs, especially where these are integrated. However, they tend to focus on a given provider's needs with respect to the provider's panel of patients. (See *Patient Empanelment*.) Once again, in a CCC program where patients will cross multiple provider entities, using a given PMS and/or EHR may not be satisfactory. However, dashboard functionality is a desirable feature of any CRM, directory spreadsheet/database, or registry being built.
- ❑ **Portals** – A portal refers to software that enables persons for whom permission has been granted to securely access either a customized view or full functionality of some of an organization's software. In healthcare:

 - *Provider portals* enable providers to access the hospital's EHR remotely – giving them the ability to view updates on their patients, enter orders into a computerized provider order entry (CPOE) system, and perform other functions.
 - *Patient portals* enable patients to securely exchange email with their providers, access recent lab results, request or make an appointment, pay bills, request a prescription renewal, view their EHR, view educational material, update contact information, download and complete forms, etc. Although functions that can be performed using a portal vary significantly by vendor, as the M.U. incentive program increasingly requires patient access to their health information, hospitals and physician offices are adopting portal technology to, at a minimum, provide such access. (See *Personal Health Record*.)
 - CCs can also use portal technology to access needed patient information. Most likely this access would be similar to that of a provider's access, but with less functionality. For example, a CC should be able to view a patient's record but not enter information into a patient's EHR. The challenge at this time is that portals offered by EHR vendors are well integrated with that EHR, but there are few third-party portals that support integrating data across EHRs or with other software that supports a CCC program, such as CRM software. The result is that data obtained from accessing a given organization's portal must be re-keyed into other software. In addition, most HIE is not yet at the level of sophistication that all information needed by a CC is accessible.
- ❑ **Medical device integration** – The ability for medical devices to exchange data directly with information systems, such as an EHR or other software used in healthcare organizations. There are a growing number of physiological devices for home or remote monitoring on the market. Some are able to transmit data to a receiving device, such as another smart phone, but not as many are able to move the data from a smart phone to an information system. Although the devices are still very useful, it would be ideal for them to be able to transmit directly into an EHR so that the data can be processed against other data in the EHR for more robust alerting functionality. (See *Remote Patient Monitoring*.)

Data Analytics

Data analytics is defined as the discovery and communication of meaningful patterns in data. These are especially valuable when the data can be analyzed in real time and delivered to users in a visual way (e.g., graphs, maps, plots, models, etc.). Data analytics generally is performed on a very large amount of data so as to be sufficiently valid to return information to users quickly. Data analytics can more easily be performed on structured data, but there are new methods being found to perform such functionality on unstructured data as well.

Depending on the size of the CCC program, an individual program may not perform data analytics itself, but can significantly benefit from the results of such analytics. A service operated by a vendor or HIO would be a likely opportunity for most CCC programs. Benefits range from having better administrative information for billing and risk stratifying patients for recruitment into the CCC program to the underpinnings for clinical decision support in an EHR, and to track patient handoffs within a healthcare organization, across multiple organizations, and, ultimately, in the home. Much like detecting when there is fraudulent use of your credit card, data analytics can remind a patient about healthy lifestyle, provide alerts for medication administration, and support other patient wellness activities.

Optimization of CCC Technology

As with any technology, there is a learning curve that must occur prior to becoming sufficiently proficient, and before being able to identify the needs for optimization. Optimization refers to the process in which the efficiency and effectiveness of technology is reviewed and improved.

Some of the scenarios one finds when taking time to assess optimal use of technology include that the technology is being used for *basic* functionality, but:

- Additional functionality has not been explored for use or adopted
- It is not saving the time anticipated
- It is not returning an investment in quality improvement
- Other organizations that have implemented similar technology report greater satisfaction
- Primary or secondary users are asking about additional features and functions

Any of the above scenarios should trigger an assessment for optimal use of technology.

A technology optimization assessment may be performed:

- By the **primary user** or “system owner.” Time must be set aside to formally conduct an optimization assessment, which may include:
 - *Review of the functional requirements specifications* used to acquire the technology. Are there functional requirements that were requested and/or acquired, but are not in use?
 - *Review of the owner’s manual or other resources on the vendor’s website.* This may spark identification of functionality that was not even considered when first acquired, or provide an explanation for doing something that was obscure or not previously considered.

- *Review of the workflow* surrounding use of the technology. Use the *Workflow and Process Improvement* toolset to map current workflow with the technology and identify opportunities for even minor changes that may make its use more efficient or effective.
 - *Review the outputs from use of the technology.* These may be patient reminder lists, contact information in a directory, a daily schedule, or others. Are these outputs helping you? Are there additional elements desired? Would reformatting help? It may be found that just one additional piece of data in the reminder lists or a field to categorize something in the directory is all that is needed to help make better use of the technology.
 - *Identify the results of use of the technology.* The results of the technology use should relate to the overall goals of the CCC program. Are the right patients recruited into the program? Are patients being kept out of costly healthcare services? Are patients being referred within a “narrow network” of providers who have proven their ability to render cost effective and high quality care? Are patients’ lifestyle changes making a difference? While there is not a direct one-to-one correlation between such outcomes and use of technology, a review of the results can help you think through what technology changes may be of value to you.
- ❑ With an **internal workflow and process improvement specialist**. This individual already may be available to EHR and other technology users from a health informatics department. This individual also may come from the health information management department, process improvement office, or other internal resource. A workflow and process improvement specialist is often able to pinpoint needed changes that the users themselves are not able to visualize. In addition, workflow and process improvement specialists recognize that the parts of the process that are most visual are often not those that are most important. Rather, “thought flow,” or how technology changes how humans interact with data and information, must be considered. This may entail fine-tuning the software so that the right data – which probably already exists – is provided at the right time, to the right people, in the right format, and in the right manner.
- ❑ By the **technology vendor**. There is some risk in bringing in the vendor to help optimize existing software. However, vendors who recognize that optimization of existing technology probably does more to sell additional products and services than a hard sales pitch, can be helpful. The vendor should provide an experienced analyst to perform such an assessment. This analyst knows the product inside and out and should be able to lead users to undiscovered functionality. Vendor analysts may be able to “tweak” the software on the spot so that a new field can be added or new report field generated.

[Note: Be aware that such adjustments to software are actually use of internal tools to make desired changes, not changes in the underlying software, which generally will not be performed without a formal change management approval process and fee paid above and beyond the consultation fee for the optimization review. Not all software will have sophisticated internal tools to support such adjustments. Changes to the underlying software should not be taken lightly, as they have an impact upon your

organization's ability to manage subsequent upgrades and to interface one system with another. However, requests for such changes, even if not fulfilled, can lead to modifications to the software in subsequent upgrades for all customers. Hence, there is value in making such requests, or at least providing the vendor formal input into product development.]

- ❑ By a **workflow and process improvement consultant**. Though this may be the most expensive option, it may be the most effective. It is well-known that it often takes someone from the outside looking in to both see opportunities and effectively convince others to make changes. Such an individual should be able to perform all the assessment aspects as described above, with the possible exception of changes specific to software – but can work with your vendor to ensure appropriate changes are made.

As part of the optimization process, it can be helpful to document what potential changes were identified and what changes were made. Over time, review the changes that were made to determine that they are still in place and are producing the desired results. Return to the list of opportunities to see if they are still good candidates for further improvement.

Workflow and process improvement should be a continual process. As the environment changes – perhaps a broader scope of patients in the population served by the CCC program, changes to fee structures, new research, and others – use of technology and its associated workflows and processes should also change. Reviewing the documentation also helps to ensure you are not returning to “old ways” of doing things.

References

¹ *Registries for Evaluating Patient Outcomes: A User's Guide*. Available at: <http://effectivehealthcare.ahrq.gov/index.cfm/search-for-guides-reviews-and-reports/?productid=1897&pageaction=displayproduct>

² Digital dashboard: <http://en.wikipedia.org/wiki/Dashboard> (management information systems)

For support using the toolkit

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