

## Tasks and Key Lessons:

Excerpts from *Improving Outcomes with Clinical Decision Support: An Implementer's Guide, 2<sup>nd</sup> Ed.*<sup>1</sup>, published by HIMSS © 2013; used with permission.

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## Chapter 1: Basic Concepts and Approach

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### Tasks

- Establish a strong, shared foundation for yourself and your team around basic concepts such as the broad CDS definition and toolkit and the 'CDS Five Rights' framework. Use this foundation to underpin your efforts to develop a successful CDS program and target-focused CDS interventions. (Worksheet 2-2)
- Begin building a shared vision among all those who will be touched by your CDS efforts about the role of CDS efforts in enhancing clinical, operational and financial performance.
- Consider critical goals driven by internal and external forces that can inform strategic victories to be pursued and claimed as a centerpiece of your CDS program. Recognize that these drivers increasingly require measurable performance improvement, so include measurement (such as before and after CDS interventions) as a foundational element in your CDS approach. (Worksheet 2-1)
- Become familiar with resources for information about CDS literature and best practices such as those provided by ONC, AHRQ and HIMSS.

### Key Lessons

- Clinical Decision Support is a process for ensuring that health-related decisions and actions are informed by pertinent patient information and clinical knowledge to enhance health and healthcare delivery.
- CDS should be used as a strategic tool for achieving priority care delivery objectives. These objectives are driven by external forces such as payment models and regulations related to improving care quality, safety and costs, as well as internal needs for better efficiency and other performance enhancements.
- Think of CDS broadly, not narrowly - it can involve different kinds of information that can be provided to many different care delivery participants in a variety of formats through different channels into various points in workflow. Addressing these collective information delivery dimensions appropriately to drive targeted improvements is referred to as 'the CDS Five Rights.'
- Be aware of situations where CDS has been shown to be of value, such as improving appropriate medication dosing, enhancing process measures related to preventive care, and decreasing mortality by increasing deep vein thrombosis prophylaxis.
- Appreciate the limits of evidence about when and how CDS is most useful, and supplement this with best practices and insights from your peers.
- Be familiar with known and sometimes unanticipated CDS pitfalls, such as failure to adequately address change management issues, and 'alert fatigue' from excessive or inappropriate alerting.

## Chapter 2: Organizing a Successful CDS Program

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### Tasks

- Determine and document the CDS program approach and activities, addressing key dimensions including why, what, how, who, and when. (Worksheets 2-1, 2-2)

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<sup>1</sup> Osheroff JA, Teich JM, Levick D, Saldana L, Velasco F, Sittig DF, Rogers KM, Jenders RA. *Improving Outcomes with Clinical Decision Support: An Implementer's Guide*, 2nd ed. Chicago: HIMSS. 2012.

- Integrate the CDS program with overall operations governance, and especially with quality and HIT planning and execution.
- Document a plan for prioritizing CDS-mediated improvement goals, based on internal/external drivers (e.g. Meaningful Use, Patient Centered Medical Home Certification, clinical quality measures, value-based purchasing). (Worksheets 2-1, 5-1)
- Establish CDS Team, including clinical champion(s), technical resources and administrative support. Ensure availability of staff, consultants, and/or vendor personnel to fill essential roles needed for CDS program success, including those related to program governance as well as intervention design, development, implementation and evaluation.
- Approach CDS as a shared effort with intervention recipients as part of a collaborative improvement culture. Engage all key stakeholders in the CDS program in a way that each recognizes personal advantages from the CDS activities.
- Establish oversight and communications mechanisms for key strategic and tactical decisions and activities, such as initiating, deploying and monitoring CDS interventions to achieve priority goals and objectives. (Worksheet 2-2)
- Identify primary champions representing “a collection of respected figures in various positions, such that everyone else will listen to at least one of them” and richly engage them in processes related to CDS program and intervention development.
- Consider how you will measure and report CDS program results, and address these issues in your CDS program charter as appropriate.

### Key Lessons

A comprehensive CDS Program should include all of the following to ensure success:

- Support for the program comes from all levels of the organization.
- Key stakeholders are involved.
- A clinically oriented leader guides the effort and is able to form an effective bridge between improvement requirements and system and organizational capabilities.
- A multidisciplinary CDS committee includes supporters and potential resistors because CDS is a “team sport” regardless of size or type of organizations.
- CDS program goals are aligned with strategic goals of the organization.
- There’s an ongoing commitment to bi-directional communication about the CDS efforts with all levels of the organization.
- The target audience for CDS interventions and other stakeholders are involved and engaged: do CDS with them and not to them.
- There are staff and mechanisms in place to ensure strong support and rapid problem resolution before, and especially during, early intervention implementation.
- There is emphasis on measuring CDS program effects in an ongoing fashion from the earliest stages of program development; this is necessary to make the program’s value clear and compelling to stakeholders, and to enhance this value over time over time.

## Chapter 3: Other Key CDS Program Building Blocks: Systems, Workflow and Measurement

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### Tasks

#### Systems

- Prepare an inventory of the information technology assets in your organization relevant to delivering CDS interventions. (Worksheet 3-1)
- Assess your HIT systems’ CDS capabilities and compatibility with standard vocabularies.
- Develop a roadmap for acquiring and enhancing information technology systems to meet your organization’s CDS goals.

#### Workflow

- Make sure you have the capability to carefully map clinical workflows to be enhanced by CDS—both current and desired future state. (Worksheet 3-2)

- Think broadly about who are the stakeholders in key workflow processes. Ensure your CDS team has the skills needed to meticulously document what actually happens in these processes through direct observations, instead of relying on interviews and written policies and procedures alone.

#### *Measurement*

- Make sure you have the capabilities and resources for assessing intervention effects as core components of your CDS program. (Worksheets 9-1, 9-3)
- Align your approach to measuring intervention performance against organizational goals and objectives with broader initiatives to track and improve clinical, operational and financial performance.
- Leverage CDS governance processes to establish reasonable measurement goals and expectations for improvement.

### **Key Lessons**

#### *Systems*

- Reliable, fast, and usable information technology infrastructure is essential for robust CDS interventions.
- CDS depends on access to structured (coded) data, use of standard vocabularies, and ability to aggregate information from multiple sources.

#### *Workflows*

- What CDS intervention developers and others think is happening as care processes unfold is often quite different from what is actually happening. Effective CDS interventions require knowledge of the latter, which depends on direct observation supplemented by interviews and other data-gathering tools.

#### *Measurement*

- Many organizations do not allocate enough time or resources to build adequate capability to address CDS intervention effects, but increasing global drivers for measurable healthcare performance improvement make this essential.
- Appropriately evaluating positive and negative CDS effects requires both quantitative and qualitative approaches.

## **Chapter 4: Knowledge Management for Clinical Decision Support Programs**

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### **Tasks**

- Put CDS knowledge management governance structures and processes in place – for example, to make decisions about how you will acquire, monitor and maintain CDS interventions.
- Use this governance system to create and execute an explicit approach for managing your CDS content portfolio's life cycle. This includes ensuring that CDS interventions have an appropriate scope to achieve improvement goals, are current with evidence-based best practices and are internally consistent.
- Catalog your CDS interventions and their key attributes, and use this documentation to monitor and maintain your CDS content portfolio. (Worksheet 4-1)
- Document important decisions and actions related to managing your CDS intervention assets so that you can build on this learning, and justify knowledge management activities if needed.

### **Key Lessons**

- A systematic, cyclic process for managing your CDS knowledge assets is essential and includes people, procedures and information systems.

- Knowledge management activities are an important subcomponent of your CDS program activities, and leverage decision making and management approaches and tools from those broader activities.
- A knowledge management infrastructure should be established before beginning any CDS implementation.
- External support for knowledge management activities may be available from vendor personnel or consultants, and should be used to supplement internal staff efforts as needed.

## Chapter 5: Foundational Considerations for Effective CDS Interventions

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### Tasks

- Solidify your organization's foundational understanding of CDS concepts, including the 'CDS Five Rights' framework, to prepare for choosing and configuring CDS interventions.
- Narrow the high-level improvement goals identified in Chapter 2 (Worksheet 2-1), selecting those that have the most organizational support and are most likely to succeed. Start small and build to more complex goals with experience. (Worksheet 5-1)
- Identify specific CDS objectives to achieve each high level goal. From these objectives, choose those that have the highest potential for impact and for which CDS interventions will be most practical and effective. Gather baseline data about performance on selected objectives, and work closely with stakeholders on all these activities. (Worksheets 5-1 through 5-4)
- Familiarize yourself with the wide range of CDS intervention types. Keep these in mind as you select your objectives, recognizing that any objective may be addressed through a single CDS intervention or through a package of interventions.

### Key Lessons

- The CDS Five Rights approach provides a framework for considering the what, who, how, where, and when dimensions in configuring effective CDS interventions. This framework should underpin the CDS team's efforts, including collaboration with stakeholders.
- For many important objectives, using more than one CDS intervention (a CDS package), triggered at different points in the clinical workflow for different end user types, will produce a greater impact.
- CDS interventions can be grouped into ten different types. Understanding these intervention types, their advantages and disadvantages, and how they can work together to optimize care processes, is critical in selecting and designing optimal CDS approaches to accomplish specific objectives.
- There are several steps in the CDS intervention lifecycle after determining which goals and objectives to address; these include selecting, configuring, vetting, testing, implementing, and measuring effects. We delve into these in greater detail in subsequent chapters.

## Chapter 6: Selecting Interventions to Deliver Targeted Improvements

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### Tasks

- Use results from your objective-related care process mapping to build a shared understanding with stakeholders about the workflows – and related decision support needs and opportunities - pertinent to your selected improvement objective(s).
- Understand the five CDS Core Actions that help link your objective to specific intervention types and specific steps in the workflow that are likely to be effective in addressing it.

- Consider which Core Actions apply to your objective, and for each that does, examine intervention types and workflows to see which are relevant to objective-related care processes. Use Figures 6-1 through 6-3 for details and examples. (Worksheet 6-1)
- Chose specific interventions to address your objective based on implementation factors: ease of implementation, acceptability and impact – balancing these factors based on your organization’s CDS experience and resources. (Worksheets 6-2 and 6-3)

### Key Lessons

- Five CDS “Core Actions” – recognizing patterns, formulating a plan, executing the plan, monitoring and responding to events, and communicating – broadly cover care delivery activities, and the ways in which information systems can augment this work. One or more Core Actions can be identified for a given clinical objective, and each Core Action is associated with CDS intervention types that can facilitate that action.
- Additionally, the Core Actions typically take place at different workflow points. If you understand which Core Actions drive performance on your objective, then you can identify not only some likely CDS intervention types to apply, but you can also identify when they should be applied.
- The better you understand how current care processes affect performance on your target objectives, the better able you will be to provide CDS interventions that improve outcomes. Often, the causes of high or low performance are multi-factorial, and in those cases a package of two or more interventions applied at different times can improve effectiveness more than just a single intervention.
- Each intervention type has its characteristic properties, such as how easy they are to implement, how acceptable users find them, and how effective they are at improving outcomes. When choosing among several intervention types that can address a given objective class, different organizations will have different optimal choices based on these properties.
- At this intervention selection stage, as at the subsequent stages outlined in the next chapters, it is vital to communicate your actions to key stakeholders and get their input into the planning and decisions.

## Chapter 7: Configuring the Interventions

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### Tasks

- Define the core components, parameters, and logistical details for each chosen intervention to optimize stakeholder acceptance, ease and cost of implementation, workflow effects, and benefits. Document these specifications (Worksheet 7-1).
- Ensure that critical elements are present to permit the user to fully understand the information presented and to take appropriate action.
- Run through likely intervention use cases to ensure that the intervention configurations will perform as intended.
- Validate the proposed CDS interventions with appropriate stakeholders and obtain necessary approvals; maintain continuous and effective communication with stakeholders throughout the process to increase chances that the intervention design will deliver desired results (Worksheets 7-2 and 7-3).
- Provide mechanisms to make sure that the interventions continue to work as expected in a complex and dynamic environment. This includes procedures to detect and handle changed circumstances, such as a modified code’s for a laboratory test or medication in a CDS or CIS database. (See Chapter 4 and 9 for more on maintaining interventions.) Consider backup and failsafe contingencies in case information system components that inform or deliver the intervention fail.

### Key Lessons

- There are many logistical details about an intervention that need to be carefully established to ensure that it leads to the desired benefit.

- There are core structural parameters for each intervention type, including triggering, logic, supporting data, notification (including acknowledgement and escalation), presentation, and action items. You must optimize these to make your interventions easy to use, specific and helpful for the issue at hand, and effective in achieving objectives.
- Workflow issues are again central in configuring interventions, as they were in selecting them. In particular, strive to improve user workflow (or at least avoid introducing significant new work), and to provide all the information and tools that users need to take action.
- Make sure that CDS users and clinicians - not the computer - control care processes. The intervention should not introduce any new policies without prior stakeholder consensus, and likewise should not totally restrict any clinical behavior except when there are definite and severe patient risks.
- Intervention configuration doesn't end with launch. Robust plans for gathering and responding to feedback from those receiving or affected by the interventions are needed to keep the material relevant, accurate and valuable. Continue rich stakeholder dialog about the intervention details all the way through the intervention lifecycle – before, during, and after implementation until it is retired (see Chapter 4 and Chapter 9).

## Chapter 8: Putting Interventions into Action

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### Tasks

- Develop and implement an intervention rollout plan that addresses user communications, training and feedback, as well as responsibility for monitoring implementation status (Worksheets 8-1 and 8-2).
- Confirm that you have anticipated and prepared for altered workflows and care delivery needs related to the interventions; for example, increasing capacity to provide more procedures, testing or medications that may result from successful CDS interventions.
- Before launch, test the planned CDS intervention content, mechanics, and logistics (Worksheet 8-3); consider ways the intervention could fail, and plan remedial actions (Worksheet 8-4).
- Consider how you will phase CDS intervention releases (Worksheet 8-5).
- Gather, document and address user feedback before, during, and after intervention rollout (Worksheet 8-6); make sure your CDS team has adequate capacity to obtain and respond to this feedback.

### Key Lessons

- It is essential to carefully and completely test all new CDS functionality – as well as other affected CDS and CIS systems and workflows - to ensure that the planned interventions perform as expected. Testing details depend on the CDS intervention type, the nature of the clinical content, and the underlying technology used to create the CDS intervention.
- Everyone who will use, or might be affected by, the new CDS functionality must be well informed about project status and upcoming events to minimize unintended
- Consequences and optimize their constructive participation.
- Anticipate users' training needs and provide training opportunities that fulfill them as conveniently as possible for the users.
- Consider the nature of both the CDS intervention and the clinical and technical environment when determining the speed, scope and order (that is, which interventions or units go first) for rolling out new CDS interventions.

## Chapter 9: Measuring Results and Continuously Refining the Program

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### Tasks

- Develop for each intervention a plan for identifying, tracking and addressing on an ongoing basis: availability, use and usability, unintended behavior and effects, and outcomes (Worksheets 9-1 through 9-3);
- Develop a plan for reporting intervention effects to pertinent stakeholders and supporting continuous monitoring and improvement (Worksheet 9-3);
- Track victories and exceptional efforts, frequently communicating and leveraging them to sustain performance and set up enthusiasm for future CDS interventions;
- Identify owners or responsible parties for all your CDS interventions and their content, and implement tools and processes to maintain and update intervention periodically and as needs arise (Worksheets 4-1, 9-4);
- Apply what you learn from evaluation to continually enhance your CDS program's interventions and increase their value to users and their impact on organizational goals and objectives. (Worksheet 9-5)

### Key Lessons

- Stakeholders and organizational leadership can help establish reasonable measurement intervals and expectations for improvement. Evaluating intervention effectiveness requires both quantitative and qualitative approaches.
- Log files and other approaches to tracking intervention use can be helpful for monitoring intervention effects. Details of interest include: when and how the intervention was invoked, where the user and patient were at the time, when in the workflow it happened, and how the information delivered was handled and applied.
- It is critical to iteratively refine interventions to improve their use and benefits. Improvement opportunities emerge from evaluation efforts, in concert with evolving capabilities in your CIS infrastructure and available CDS tools, new clinical knowledge, and the changing healthcare delivery environment.