Clinical Decision Support Systems (CDSS) within Behavioral Healthcare Settings

Netsmart’s commitment to supporting clinicians in improving outcomes and reducing costs

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Dennis Morrison, Ph.D.
Chief Clinical Officer, Netsmart
ABOUT NETSMART

Netsmart helps health and human services organizations transform care through the collaborative, coordinated management and exchange of clinical data across the care spectrum and through effective practice management that improves revenue cycle management. Netsmart's complete range of solutions and services, designed specifically for this industry, includes three ARRA-certified EHRs, as well as mobility features that put healthcare data right into the hands of clinical decision-makers wherever they may be, and provide the latest tools to address emerging clinical requirements.

More than 20,000 client organizations, including 350,000 care providers and more than 40 state systems, use Netsmart solutions to help improve the quality of life for tens of millions of people each year. Netsmart clients include mental health and substance use treatment agencies, psychiatric hospitals, private and group mental health practices, public health departments, social services and child and family health agencies, vital records offices, and managed care organizations.

Netsmart's solutions are full-featured information systems that operate on a variety of operating systems, hardware platforms, and mobile devices, and offer unlimited scalability. Netsmart provides the solutions and expertise that help clients meet all the criteria for Meaningful Use of an Electronic Health Record (EHR) under the American Recovery and Reinvestment Act (ARRA) of 2009. Netsmart clients can also create a complete connected care environment encompassing e-prescribing and order entry, sharing clinical information and lab results, and using Web portals to provide secure and private consumer access to care information.

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Kansas
7007 College Blvd.
Suite 550
Overland Park, KS 66211
913.327.7444

New York
3500 Sunrise Highway.
Suite D122
Great River, NY 11739
631.968.2000

Ohio
570 Metro Place North
Dublin, OH 43017
614.764.0143
SUMMARY

There is a compelling need for Clinical Decision Support Systems (CDSS) in electronic health records (EHRs). Not only it is a requirement to achieve Meaningful Use and receive incentives, it is arguably the only way for clinicians of all types to take full advantage of the knowledge available to them. While literature and studies support CDSS, behavioral healthcare has lagged behind primary care in the use of such systems. The reluctance of behavioral healthcare to embrace these technologies is due, in part, to the lack of clear standards of care and quantifiable indicators used by behavioral healthcare providers, whereas medical providers have had a wealth of measurement tools available to them which can be automated into “order sets” and CDSS.

As the healthcare industry evolves to a pay-for-performance model, we are seeing increased demands for clinical accountability in behavioral healthcare. There is a wealth of data about clinical effectiveness in our industry. Those who have historically tried to oppose these trends on the grounds that behavioral healthcare is “an art not a science” will fail. These trends will lead to more measurement and more standardization of treatment. Ultimately, they will generate the need for CDSS.

A simple definition can be found on OpenClinical:

Clinical Decision Support Systems are "active knowledge systems which use two or more items of patient data to generate case-specific advice" [Wyatt J, Spiegelhalter D, 1991].

Netsmart’s commitment to clinical innovation enables organizations to have standardized and consistent internal processes that lay the groundwork for documenting improved outcomes. These tools provide increased access to consumer information, clinical decision support and improved medication management via EHRs.

For more information about how Netsmart’s experience, industry leadership and innovative solutions and services can help clinicians across health and human services achieve success, visit www.ntst.com or call 1.800.472.5509.
Clinical Decision Support Systems and Their Impact on Healthcare in the Era of Accountable Care

Clinical decision support systems (CDSS) systems improve healthcare delivery by providing clinicians, staff, consumers, and other individuals involved with a consumer’s care with background, knowledge and consumer-specific information that is filtered in an intelligent manner and presented at appropriate times. There is growing recognition that CDSS, when designed and implemented well, can offer significant benefits to improve overall quality of care, increase care efficiency and reduce healthcare costs. While electronic health records (EHRs) are the foundation for consumer safety and health care quality improvement, CDSS are essential elements in fully realizing these goals.

In general, CDSS can do many things, but the most common are listed and then discussed in greater detail below:

- Alerts and Reminders
- Diagnostic Assistance (Diagnostic Decision Support Systems - DDSS)
- Prescription Decision Support (drug-drug interactions etc.)
- Information Retrieval
- Image Recognition and Interpretation
- Therapy Critiquing and Planning (CPOE monitoring, variance from best practices)

(http://healthinformatics.wikispaces.com/Clinical+Decision+Support+Systems)

Alerts and Reminders

These are the simplest of the CDSS interventions and include routine alerts and reminders regarding drug interactions, as well as risk management concerns such as suicide alerts or averting adverse drug events, etc.

One of the challenges for all EHR developers is determining how the alert system should look to the provider. This is a subject that is difficult to discuss in a one-dimensional medium like this paper. Nonetheless, this is where we can learn from our medical counterparts, due to behavioral health’s time lag behind primary care. That sector has a wealth of experience in the look, feel and utility of CDSS prompts. Generally, we suggest you look at three levels of feedback to end-users:

- Information
- Important
- Critical

Initially, Netsmart will first build “Important” and “Critical” into alerts. “Information” that does not meet these criteria can be brought to end-users’ attention in other, more routine ways. This is important because CDSS systems will fail if they are used for trivial reasons. Providers
experience “alert fatigue” when bombarded with too many alerts or with alerts that don’t tell them something important. If everything is important, then nothing is. In this case, less is more.

The look of the alert will depend on the level (Important or Critical). It will also depend on how the EHR will be used. In an ideal world, all clinicians would do concurrent charting so the alerts that show up on screen would be acted on immediately. The reality is that, so far, only a small number of clinicians practice this way. It will likely be necessary to devise other ways of alerting, such as through e-mail or text messaging.

**DIAGNOSTIC ASSISTANCE**

Diagnosis is often considered a perfect place to start with decision support but it does present unique challenges.

There are competing schools of thought in behavioral healthcare about the relevant merit of getting an accurate diagnosis versus focusing on objectively measured functional changes. One side contends that improving the accuracy of diagnosis will improve care. This side includes physicians or others who follow a medical model. Others argue that diagnosis doesn’t contribute much to what one actually does in treatment. Indeed, many have argued that the “golden thread” that links the four important parts of clinical care and documentation (Functional Assessment – Diagnosis – Intervention – Outcomes) are best done in that order. Others would argue that the correct order is Diagnosis – Problem ID – Intervention – Outcomes. The difference is not trivial.

In the first sequence, the clinical focus is on helping the individual with those areas of life that are not working as well as they could. These are usually areas that are readily observable to both the provider and the consumer such as inability to hold a job or interpersonal problems. In this sequence, diagnosis follows and is used to describe why those functional impairments are occurring. Since the functional deficits are the focus of treatment, differential diagnostics are less important.

In the second scenario, the diagnosis must be made accurately since it will be the focus of treatment and the functional impairments will be secondary. This way of thinking is clinician-centric while the first model that focuses on impairments is consumer-centric. In both cases, some form of assessment may be used to determine the level of functional impairment or diagnosis. The key word here is “may.” Clinicians may rely on client self-reporting to determine problems in functioning in the first scenario and clinicians may use their own diagnostic interviewing skills to make a diagnosis in the second scenario.

Each type of evaluation would be enhanced through the use of objective assessments. There are a variety of tools that perform this type of assessment, including the Daily Living Assessment (DLA) and the CANS/ANSA tools. Diagnostic assessment is harder to do using objective instruments. This is in part due to the time it takes to work through the branching logic needed to rule out all the various iterations of diagnoses. For example, the Structured Clinical
Interview for Depression (SCID) can take 30 minutes or more to arrive at a correct differential diagnosis. The SCID is often used in clinical trials when accuracy and high inter-rater reliability are needed, but clinicians rarely use this instrument in provider settings.

**PRESCRIPTION DECISION SUPPORT**

Netsmart already has CDSS in their secure, Web-based e-prescribing and medication management solutions InfoScriber and OrderConnect. An enhancement to the traditional prescription-based CDSS (drug-drug and drug-food interactions) would be to expand the functionality into Drug-Lab interactions because some labs are only or frequently ordered when certain conditions are present for which certain drugs are used. The alerting system would be "smart" enough to know the relationship between the lab test, the condition for which it is ordered and the drug(s) commonly used for that problem. Then, the traditional drug-drug interaction engine could be activated to trigger the alert even though one of the drugs wasn’t actually prescribed. This technology is already present in some CDSS systems.

**IMAGE RECOGNITION AND INTERPRETATION**

We are already seeing expert image processing systems capable of interpreting clinical images such as x-rays, MRIs and CT scans. The applicability of this technology in behavioral healthcare may be closer than imagined especially if/when we begin collaborating with clinical researchers. It is not unrealistic to imagine Functional Magnetic Resonance Imaging (fMRI) being used to diagnose mental health problems in the near future. This technology is in its infancy in clinical settings, but it is a very popular line of research.

**THERAPY CRITIQUING AND PLANNING**

Not surprisingly, this is the CDSS functionality that most clinicians hear about and it is also the one that causes them the most concern. Organizations using software with real CDSS imbedded in it sometimes need help convincing clinical staff that CDSS will enhance rather than threaten their implementation of care by helping them make decisions even more effectively. Partners like Netsmart can help with this through training and by coaching an organization’s clinical leadership about how to make this a positive message. An example of such a message would be, “We believe you want to be a better clinician tomorrow than you are today. The EHR can help you do that.” It is probably helpful to start CDSS implementations with less threatening and more immediately helpful types of feedback, including those centered on risk management issues (suicide alerts or averting adverse drug events, etc.). Concurrently, clinical and administrative leadership need to know not to use this in a punitive fashion and to avoid linking CDSS compliance to performance reviews. In general, the core message to clinicians is that this is an aid to help inform their decision making, not a decision making tool meant to supplant a clinician’s judgment.
In an ideal world, we want commonly-used CDSS tools that end users can choose to use or not use, are built into the EHR and include a user-configurable capability that allows clinicians to build CDSS functionality using data elements in their own system.

Ultimately, we also want to incorporate information from external sources that integrate into the CDSS system. As seen below, those external sources include Clinical Research databases to inform clinicians about the most efficacious treatments; Practice-Based Evidence databases that accrue comparative information from providers within and outside the organization to demonstrate models of clinical effectiveness; and interoperability with Personal Health Records (PHRs) and other consumer-facing tools that give consumers access to some/all of the information in their EHR and the ability to add content to the record through PHRs or consumer portals.

![Ideal EHR with CDSS](image-url)
EXCEL

As we look at the user interface (UI) of how to configure CDSS, we might consider Microsoft Excel® as a model. If the logic of CDSS looks familiar, it should. In many ways, the conditional formatting used in Microsoft Excel is similar. As shown below, the logic involved in these formatting tools mirrors closely what we are building into Netsmart solutions except, instead of the result of the activity being a formatted cell, it is the generation of an alert or a message to a clinician.

Figure 1 Formatting Rule Window in Excel (1)

Figure 2 Formatting Rule Window in Excel (2)
NETSMART’S COMMITMENT TO CLINICIANS TO TRANSFORM THE INDUSTRY

Through innovative and interactive solutions and services, Netsmart leads our industry in transforming the way care is delivered. Our expertise in helping organizations navigate their way through Meaningful Use and Accountable Care shows our commitment to partnering with organizations of all sizes to ensure they have the technology and know-how they need to deliver the highest level of care to those they serve. Healthcare today is an ever-changing, rapidly-evolving world. Organizations must seek technology partners who understand their current needs and have their pulse on the industry to envision how needs can be met in the future. Our obligation is to guide our clients through this rapidly changing environment by providing them with solutions and services that help improve outcomes and reduce costs. We will help each of our clients adapt to these changes so that they can reach their goals and improve the health of the populations they serve.

At Netsmart, we are at the forefront of healthcare innovation and moving forward at the speed of thought. We continue to evolve our services and solutions to meet the needs of our clients today and in the future. We are committed to ensuring that our clients in behavioral health, public health, substance abuse and addiction services emerge from the healthcare reform era as leaders in their respective fields of specialization.

ABOUT THE AUTHOR

Dennis Morrison, Ph.D., is Chief Clinical Officer for Netsmart, the leading provider of clinical solutions for health and human services organizations nationwide. Morrison leads the Netsmart clinical team in transforming clinical care in behavioral health by focusing on evidence-based practice, recovery- and research-based care, coordinated care planning, and the integration of behavioral and primary care.

Dr. Morrison has worked in the behavioral health field since 1969. Academically, he holds Masters degrees in Psychology and Exercise Physiology from Ball State University. His doctorate is in Counseling Psychology also from Ball State University. He is co-inventor on a patent for a behavioral healthcare outcomes software product.

Prior to joining Netsmart in 2012, he served as the CEO of the Center for Behavioral Health (CBH) and CEO for Centerstone Research Institute (CRI).

For more information or to talk one-on-one to a Netsmart representative about how Netsmart’s solutions can help you provide the highest level of clinical outcomes, visit www.ntst.com or call 1.800.472.5509.