

## Diabetes Telehealth and Computerized Decision Support Systems: A Sound System with a Human Touch Is Needed

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### Abstract

Telehealth holds the promise of improved consistency and fast and equal access to care, and will have great impact on future care. To enhance its quality and safety, computerized decision support systems (CDSS) have been launched. This commentary focuses specifically on the impact of telehealth and CDSS on diabetes patient management. Ideally, clinical information should be linked to evidence based recommendations and guidelines in the CDSS to provide tailored recommendations at the moment of care. However, technical support such as CDSS is not enough. The human touch is essential. A named healthcare provider *with access to telehealth and CDSS* seems to promise a way of providing both patient-centered and evidence-based care.

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“Telehealth” has been launched as an overarching concept for nonvisit care by the American Nurses Association. Telehealth holds the promise of improved consistency and fast and equal access to care, and it will have a great impact on future care such as improved decision making, remote/rural area care, and collaborative arrangements for real-time management.<sup>1</sup> The concept thus includes telemedicine, telecare, telenursing, video conferences and consultations, and e-health. All these are expanding services in the western world. In the United Kingdom, for example, NHS Direct provides 24-hour care over the phone, the Internet, and digital television. Telehealth is not only a way of responding to increased demands for fast access to health care, it is also a way of economizing when financial resources are limited and chronic illnesses such as diabetes are reaching epidemic proportions. Good telehealth programs support, rather than replace, health care services. It has

been suggested that telehealth works best with patients who need the most frequent health care contacts, such as those with longstanding illnesses, e.g., diabetes<sup>2</sup> or congestive heart failure. To enhance the quality and safety of telehealth, computerized decision support systems (CDSS) have been launched. This commentary focuses specifically on: (1) if and how telehealth and CDSS can impact diabetes patient management, and (2) why we need to blend CDSS with customization and human interaction to improve diabetes management by telehealth.

What then is a CDSS? According to Osheroff and colleagues,<sup>3</sup> clinical decision support provides clinicians, staff, or patients with knowledge and person-specific information that is intelligently filtered or presented at appropriate times to enhance health and healthcare. Klonoff and True<sup>4</sup> argue that a decision support system for clinical use should include some or all of the following

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**Abbreviation:** (CDSS) computerized decision support systems

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components: standardized formats for data presentation, computerized alerts, a validated database, order sets, patient data, documentation templates, workflow tools, a method to incorporate new and updated information about treatment, assessment tools, and a method for scaling benefits of co-morbidities. When implementing such technical aids in health care, it is not self-evident that doctors, nurses, or patients will agree on their benefits. However, technology adoption is not possible without the buy-in of these groups. It has been shown repeatedly in different settings that health professionals acknowledge the benefits of different types of decision support. They seem, however, more enthusiastic in theory than in clinical practice,<sup>5</sup> worrying about how time consuming it might be.<sup>6</sup> However, a Dutch study comparing two primary care practices with and without decision aid systems for general telephone triage found that call length differed only slightly and that longer call length with the use of CDSS is compensated for by fewer general practitioner contacts.<sup>7</sup> This would possibly hold true also for CDSS used in telehealth diabetes management.

When it comes to telenurses' experiences with using CDSS in general, they seem to have mixed feelings and experiences of CDSS as simultaneously inhibiting and improving quality.<sup>8</sup> There is also a risk that CDSS might undermine the nursing process<sup>9</sup> and the individualized care nurses wish to give. A review found that CDSS improved practitioner performance; however, improvement in patient outcomes was less than expected.<sup>10</sup> According to Schnipper and colleagues,<sup>11</sup> "the challenge is to build a decision support system with sophisticated content that blends seamlessly into a clinician's workflow and is easy to use." It is important that the CDSS is evidence based and scrutinized by experts before implementation. However, a scientific and medically sound base is not enough. To enhance usability and user friendliness, the base also needs to be updated and adopted to local practices and organization,<sup>8,9</sup> otherwise it might be overruled or manipulated. The CDSS also needs to be speedy and incorporated into the patient's medical record, otherwise it will not be used.<sup>5</sup>

Having discussed mixed feelings and experiences with CDSS among doctors and nurses, what then about feasibility? When searching for literature on CDSS for diabetes telehealth, it is not easy to find published papers. I agree with Klonoff and True<sup>4</sup> that CDSS seems to be a missing element for diabetes telehealth. However, several studies have been conducted to test different telehealth systems for diabetes care. Examples of such studies

include the impact of a teleassistance system on the metabolic control of type 2 diabetes patients,<sup>12</sup> which supported the general practitioner in their follow-up of patients. Farmer and associates<sup>13</sup> studied if telemedicine support can improve glycemic control in type 1 diabetes patients and found that the system was feasible but did not significantly improve glycemic control. They concluded that access to real-time decision support would be needed. Chumbler and coworkers<sup>14</sup> suggest that daily telemonitoring reduced mortality among veterans with diabetes. Farmer and colleagues<sup>15</sup> also conducted a systematic review of telemedicine interventions in diabetes in 2005. They emphasized the importance of educational and self-management interventions, not only feasibility. Another review two years later<sup>16</sup> established that teleconsultation programs, including daily monitoring of clinical data, education, and personal feedback, were found to be most successful. In a study on telehealth practice recommendations for diabetic retinopathy,<sup>17</sup> the authors state that sound medical judgment or traditional clinical decision making cannot be replaced by telehealth systems. Disappointingly, advice via televisits compared to regular nurse management did not decrease cost in type 2 diabetes care.<sup>18</sup>

Regardless of whether CDSS is used or not used, it is of utmost importance that the health care provider and the diabetes patient have identified common goals for care and treatment. Otherwise, it might be unnecessarily difficult for them to work together, and the risk for misunderstandings is considerable.<sup>19,20</sup> The patients' different phases in life<sup>21</sup> and differing socioeconomic status, health literacy, and working conditions create different challenges and opportunities to achieve treatment goals. Information and treatment need to be integrated into an individual's life in unique ways for every person. Many CDSS are currently structured for a "standard patient." Those patients are more common in textbooks than in real life. Ideally, clinical information should be linked to knowledge of evidence-based recommendations and guidelines in the CDSS to provide tailored recommendations at the point of care.<sup>5</sup> It is particularly noteworthy that a CDSS provides *recommendations* for care and treatment, not compulsory actions.<sup>4</sup>

As argued here, the design of the CDSS and its ability to be integrated into a given clinical setting are crucial for best clinical outcome.<sup>22</sup> Human factors have great impact on how a CDSS or protocol is used.<sup>22</sup> The health professional needs to trust the clinical efficacy of the CDSS, and the implementation process is important. Why, how, and by whom is the CDSS introduced? Was it implemented

top down (“you need to conform to this protocol”) or bottom up (“we need to improve consistency and efficiency at our clinic”)? Furthermore, the health professional worker is human and can only handle a limited amount of data or processes at the same time, even if he or she is an experienced clinician who has learned multitasking the hard way. If the CDSS require many interruptions or extensive data management or input, there might be noncompliance from the professional, often unintended, of course. Hence human factors are at play, and errors are distressingly common.<sup>5</sup> This risk should be minimized, but cannot (at least to date) be erased. Hence mandatory use of CDSS for health care professionals seems to create better outcomes than on-demand use.<sup>23</sup>

The underlying idea behind a number of CDSS is that decision making in medicine and nursing, whether face-to-face or by telehealth, is a mechanical and linear process moving from A to B. In real life, however, the process is much more complex, as is the kind of knowledge needed. *Techné*, which could be described as scientific knowledge, formal, explicit, and certain, is evidently needed. In the context of telehealth, *techné* can be exemplified as standard measurements and laboratory metrics built into a CDSS. These should be refined, individualized, and incorporated as a tool for enhanced treatment and learning about living with diabetes. When personalized advice is given by health care professionals to patients with diabetes, patient history, comorbidities, family history, laboratory results, and personalized tips about overcoming barriers should be included.<sup>24</sup> In addition, personalized care for diabetes patients might also include genetic information about the patient in the future.<sup>25</sup>

However, medical and caring practices also demands *phronesis*, actions based on contextual experience, judgment, and wisdom. This kind of knowledge hence requires a skilled professional. Doctoring and nursing requires relational and communicational skills. The relationship determines what will be disclosed by the patient and talked about. Consequently, competence in communication is also essential for telehealth. Patients with diabetes have emphasized the importance of having a named health care professional at the moment of contact. This seems to be particularly important during the first six months of diagnosis.<sup>21</sup> Hence, technical support such as CDSS is not enough. The human touch is essential. This means that we need to blend CDSS with customization and human interaction. A named health care provider with access to telehealth and CDSS seems to promise a way of providing both patient-centered and evidence-based up-to-date care. To conclude, telehealth

is here to stay in diabetes care management and CDSS would be a powerful tool for improving care. However, reflective patient education will also, in the future, be necessary to make patients experts on their illness and bodies. Technology will complement this. The CDSS that can be adjusted and individualized for each unique patient and current complaint through their medical record would indeed prove beneficial for both health care professionals and patients with diabetes. The ultimate goal would be reduced hospitalization, healthier and self-managing patients, and improved outcomes of care that also lead to cost savings. The latter is yet to be proved.

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