

The Evolution of Goal-Negotiated Care

Donna Rochon^{1,2}, David S. Buck^{1,2}, Kallol Mahata², James P. Turley³

¹ Department of Family and Community Medicine, Baylor College of Medicine, Houston, Texas, USA

² Healthcare for the Homeless—Houston, Texas, USA

³ School of Health Information Sciences, University of Texas Health Science Center at Houston, Texas, USA

ABSTRACT

Objectives: The objective of this case study was to implement goal-negotiated care (GNC), an innovative health-care model, on handheld technology and evaluate its overall effectiveness in improving patient engagement. **Background:** Homeless individuals face numerous barriers that make it difficult for them to access health-care services. While this can create feelings of powerlessness, increasing self-efficacy can reduce risk and improve health outcomes. **Methods:** A heuristic process was used to develop and revise GNC to facilitate patient engagement and create an efficient workflow for clinicians. Because technology was needed to drive the program, different types of handheld platforms were tested to determine which one was best-suited to the GNC model. **Results:** Although personal digital assistants proved inadequate for the task, tablet personal computers allowed clinicians the freedom to navigate back and forth between the clinical encounter and goal setting. The providers could track patient goals and address patient needs directly, shifting the paradigm from a problem-based focus to a solution-oriented one. Decreased time spent charting notes meant that clinicians could spend more time engaging patients and building successful relationships. Patients were receptive to the technology and seemed to benefit from the increased interaction time with providers. **Discussion and conclusions:** Based on their experiences during field testing of the program and the technology, clinicians felt that GNC increased patient engagement and self-efficacy. This has implications for the structure of health care within both the clinician-patient relationship and the health-care system. Further, the success of GNC with homeless patients may be an indication that it could work well with other hard-to-reach patient populations.

Keywords:

Patient-centred care, homeless, handheld computers, tablet PCs

INTRODUCTION

This case study describes an improved model of patient-centred care to enhance patient engagement and continuity-of-care. The current implementation is designed for the homeless and uses custom-designed software for Tablet Personal Computers (TPCs). In addition, this lightweight electronic medical record (EMR) has the potential to be used with other populations who have a need for episodic care with limited long term follow-up, such as those in emergency situations and disasters.

BACKGROUND

Boyce [1] suggests that the tendency toward victim blaming, particularly of homeless individuals, has created structural influences and constraints on the participation of these groups in the health-care process. In general, the rules, values, attitudes, and activities of health-care and service organisations are designed to limit the input of the individual consumer by placing him or her in a position of passivity and powerlessness in relation to that of the service provider. This learned helplessness and resulting disengagement may be an anticipated result of homelessness and the

simultaneous loss of hope, which creates a self-perpetuating cycle of hopelessness, low self-efficacy, low self-esteem, and depression [2]. Similar responses have been seen in those who have experienced traumatic disruptions in their lives [3]. By intervening in the cycle of hopelessness, the health-care professional can help restore self-efficacy, raise self-esteem, and ease depression [2].

The theoretical construct of self-efficacy has been used widely in public health programs and interventions [4, 5] and more recently in medical practice [6, 7]. The premise behind the construct is that greater confidence in performing a particular behaviour makes it possible for an individual to change unhealthy or risk-taking behaviour (i.e., reducing fat intake or stopping cocaine use) and become more engaged in the health-seeking process. Self-efficacy Theory suggests that any such change made by the individual will lead to an improvement in health outcomes. Goal-negotiated care (GNC), a locally-based implementation driven by Self-efficacy Theory and patient-centred care, was developed for the homeless and entails more than simply changing a homeless person's risky behaviour. GNC engages homeless patients in a different way. With the addition of self-efficacy as a guiding principle, GNC is the first effort to focus on the homeless patient's need to experience success working with others and to reinforce his or her efforts to reengage with society.

Further complicating the care of homeless patients is the perceived need of many homeless persons to remain independent and to protect their space. This perception often keeps them from going to shelters or clinics or from forming affiliations with any organisation or small group. Such a transient lifestyle makes the homeless very difficult to evaluate and track over time in terms of adequate health-care provision. In an effort to provide basic health care to homeless patients and to develop a trust relationship, providers need to meet their patients' primary health-care needs through outreach on the streets [8]. For this reason, medical street outreach has become a common feature of numerous community health service programs. Clinicians provide basic or triage care to homeless individuals in settings as diverse as soup kitchens, on the streets under bridges and overpasses, and in shelters [9]. This outreach is undertaken to improve the health of homeless patients and to encourage the utilisation of human services and health-care resources. Other high-risk populations have shown a similar need to be "met on their own turf" [10].

Handheld Technology

There are plenty of examples in the medical and technology literature about the merits of handheld computers, or personal digital assistants (PDAs), in medical practice [11, 12]. PDAs offer greater mobility and flexibility and can improve the efficiency and accuracy of clinical tasks [11].

Eliminating the need for the transcription of notes into patient files means that clinicians can spend more time in direct patient care, which could lead to an improvement in the quality of care that patients receive [13, 14]. Two-way synchronization allows the creation, update, and deletion of patient records from any location [15]. The researchers are aware of only two programs in Boston, MA, and Pittsburgh, PA, in which PDAs are being used for any data collection on the streets with the homeless. Neither site has invested in software loaded with an innovative model of care.

Moving beyond PDA technology, we are just beginning to see the movement toward newer devices in the form of TPCs. These are similar to a laptop computer but the user can write directly on the screen with a special pen. TPCs have been evaluated for Blue Cross/Blue Shield by Boston University Graduate School of Management [16]. According to Fujitsu Limited [17], the decision to choose the TPC over a notebook computer rests on whether or not the user has to work while standing or walking around. A pen tablet has a significant advantage over a notebook because it permits mobility. Obviously, "walk around" technology is needed when conducting outreach and working with street homeless outside the clinic setting.

METHODS

Development of the GNC Program

Past outreach efforts on the streets of Houston, TX, by Healthcare for the Homeless—Houston (HHH), a provider of free health care for the homeless, involved handing out lunches and encouraging homeless individuals to seek health care at established clinic sites. This impersonal approach did nothing to encourage patients to seek future care or to return for follow-up care with the van. The medical director of the program, a member of the research team, drew on his clinical experiences during medical outreach to develop goal setting with patients. Working with the clinical team and a software developer, the GNC model was conceptualised and operationalised into a program for handheld computers. The PDAs became a convenient mechanism for initiating GNC as the standard of care during street outreach. Using a collaborative approach to goal setting, the outreach team toured the streets van to increase goal setting, engagement, and self-efficacy among the street homeless through a more efficient workflow. In addition, clinicians attempted to remove care barriers and empower homeless patients to make decisions regarding their own health by negotiating goals. The ultimate benefits of the technology were the ability to track and follow up on goals negotiated with each patient, as well as the capability to share information among clinicians.

During the first stage of the project, the physicians and family nurse practitioners (FNPs) that provided the outreach services were able to record the entire encounter on-site, including demographics, patient history, medical diagnosis, and goals. Upon completion of the clinical encounter, the clinicians negotiated goals with the patients that would meet their particular health-care needs. All follow-up encounters included goal assessments from previous encounters to determine if goals were completed. Unfortunately, after two and a half years of collecting data on the streets, the PDAs proved incapable of storing the large database and the use of this technology was discontinued [18]. However, repeated discussions with the clinical staff throughout the development process helped to define the GNC workflow for various settings. Staff meetings were held regularly to understand what information relating to goal completion was most vital to the clinicians. Content analyses of the copious goal data provided the initial structure for the GNC logic. The original goals database (n = 3,048) was collapsed into 15 goal categories based on similarities in terms of type of goal set during the encounter. The multiple categories were eventually reduced to seven core goals to become the final framework of GNC.

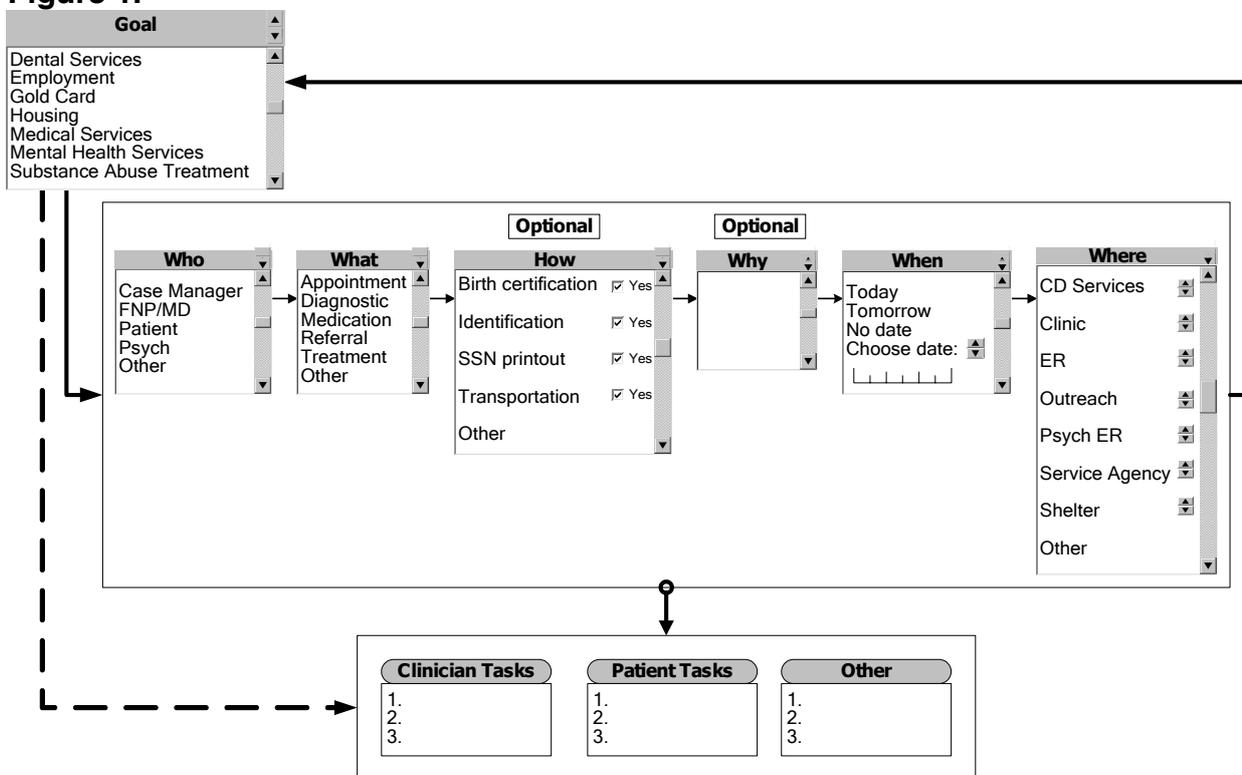
Redeveloping GNC

Although the PDAs proved to be ineffective, the positive feedback from the pilot study [18] led to a change in strategy in 2004 to developing a TPC platform. The researchers enlisted the services of a senior class from the Information Systems Program at Carnegie Mellon University (Pittsburgh, PA) to redesign the software program, this time to conform to a TPC platform (Model LE 1600 from Motion Computing, Inc.). This meant that the visual display could be larger (30.73 cms), with each screen containing more fields. The students were able to provide a functional interface that allowed for the collection of basic demographic and clinical data; they did not have the time or capacity to build the GNC interface.

Since then, the availability of the LS800 Mini TPC, from Motion Computing, Inc., has led to reprogramming for the smaller screen (21.34 cms); weighing only 0.997 Kgs, it is easier to use, stow, and transport than other TPCs currently available today. The LS800 easily fits in a large lab coat pocket or purse. The TPC version of GNC has now undergone extensive fine-tuning, not only

to fit the smaller screen size of the LS 800 but to improve the encounter workflow and data collection. HHH’s FNP’s have been actively involved in a heuristic process, providing regular feedback based on their experiences during medical street outreach. The core of the program—the GNC logic model—was subsequently developed by the research team in collaboration with a doctoral student in Computer Science. Regular meetings over several months to brainstorm the program logic led to the creation of a schematic representing every foreseeable permutation of the care process. What emerged through this iterative process was a prototype based on the five “W’s”: who, what, why, when, and where (see Figure 1). The team then generated a logic spreadsheet for the doctoral student to write the GNC program for the TPC. Because of the peculiarities of the Texas health-care system and the difficulties that indigent patients face when negotiating through the complex health-care system, the logic table was an extremely detailed and comprehensive. The new GNC allowed clinicians to easily navigate through a care encounter.

Figure 1.



In a traditional, problem-based clinical encounter, the clinician tends to move linearly from patient history to diagnosis and treatment; tasks for patient and provider occur as the outcome of the encounter. The most attractive feature of the updated GNC model is the ability to navigate between goals and tasks in a bidirectional manner. One approach, using GNC within a traditional care encounter, involves identifying the problem, formalizing goals with the patient, and assigning tasks for both. For example, a patient presents complaining of lower back pain, the clinician collects a brief history, completes the exam, and demonstrates some pain reduction exercises; a date is then set for a return visit.

With the alternative approach, the clinician uses the patient goal as the starting point then moves backward *or* forward through the who, what, how, why, when, and where components; the system identifies the required tasks as the need arises. The value of the system is the flexibility it gives the clinician and patient to change approaches “on the fly.” To illustrate, the patient begins by saying he

wants to obtain employment, but lower back pain prevents him from holding a job; the clinician demonstrates some pain reduction exercises and makes an appointment for the patient to see the case manager about job opportunities. The TPC program reminds the clinician to schedule a follow-up appointment in addition to generating a reminder for the patient about his appointment dates. The entire process becomes much more interactional for both clinician and patient, empowering and building the patient's self-efficacy by addressing his/her specific goals and tasks.

RESULTS

Despite the early technological failures, the pilot project provided the researchers with sufficient evidence to support continuing development and implementation of the GNC program. Although much of the feedback is still anecdotal, there are definite indications that Houston's homeless are benefiting from the GNC care model. For instance, clinicians feel that the inclusion of self-efficacy theory has improved the clinician-patient relationship as well as the quality of care. They feel that the menu-prompted platform facilitates goal setting and engagement with patients. It also makes history-taking more efficient and provides direction about goal negotiation. Patients seem more engaged in the process of care and are more likely to return for follow-up [18].

Clinical information can now be accessed by multiple providers, assisting coordination between colleagues seeing the same patient at other sites. Clinicians have access to other needed information at their fingertips (i.e., bus schedules, clinic hours, eligibility determinations). Because of the shared information, patients do not have to repetitively answer questions regarding their medical history and providers do not have to recreate documentation. The resulting increase in encounter time means patients can be treated more appropriately for complex or long-term issues. More notable, patient engagement has increased and clinicians can focus on building relationships with homeless.

The patients' attitudes toward and acceptance of the technology and GNC proved to be surprising. The researchers assumed this population would be anxious about the use of technology, feeling either intimidated by it or, in the case of patients with personality disorders, viewing it suspiciously as a personal threat. On the contrary, patients seemed nonplussed by its use and in fact, many were flattered that such "high-tech" methods were being used with homeless patients. Through participant observation, it has also become obvious that patients enjoy the increased time spent with clinicians and that their levels of engagement with the care process have increased.

Perhaps the greatest strength of the GNC program has been the iterative development process, which allowed the research and clinical teams to periodically revisit the effort and determine what improvements were needed. During this time, we have continued to conduct field tests of the software at various stages of its design. In addition, the FNPs have supplied the researchers with extensive details on what variables and fields should be added or changed in the program to refine the encounter flow. They also helped structure the pick lists to default to the most common outcomes, with other choices following in alphabetical order, to decrease data collection time. The FNPs have used the GNC-enabled TPCs with patients on the street and at a soup kitchen. These *in vivo* situations have confirmed the usability, practicality, and acceptance of the system.

DISCUSSION

The FNPs and physicians have been very enthusiastic about the launch of the TPCs, particularly the smaller model. During the field tests, they readily adopted its use on the street and find that patients continue to be tolerant of the technology. The clinicians recognize the benefits of an efficient EMR since the program allows them to easily switch between clinical encounter and goal setting. This is

important because the patients often lose focus during an actual encounter. Based on experience during field testing, the FNP's believe that once the program is fully operational, the quality of care delivered will continue to improve. Clinicians will be able to spend more time focusing on patient engagement, addressing patient health-care needs, and dealing with barriers to care rather than spending time charting notes. The use of TPCs equipped with a GNC model of care will help the clinicians track goals which should improve continuity-of-care between clinicians and patients.

On an individual level, goal negotiation shifts the paradigm from a problem-based focus to a solution-oriented one. As found in the PDA study [18], this type of encounter appears to build self-efficacy and provide support as patients learn to cope with the many steps involved in successfully accessing health care. With this knowledge, we can begin to intervene at a structural level to enhance communication and service, both in the clinician-patient relationship and within the health-care system. Since GNC helps build self-efficacy and positively reinforces success, it is particularly well-suited to the needs of disenfranchised and disengaged patient populations. Consequently, the effectiveness of GNC with homeless patients can serve as a model for other populations. GNC makes patient-centred care the focal point of all clinician-patient encounters. The goals and tasks collected during previous encounters drive the subsequent meetings. In an environment where health care is episodic and fragmented, this is the core needed to improve longer-term health outcomes. We believe that the adoption of GNC will prove to be a model for other similarly disenfranchised groups, such as people without health insurance and those recovering from natural and manmade disasters.

ACKNOWLEDGEMENTS:

Funding for this project was provided by Healthcare for the Homeless—Houston. Special thanks to Lynn Kelly, F.N.P., and Loretta King, F.N.P., for their invaluable contributions to this project and for their dedication in serving the homeless.

Address for Correspondence:

Davis S. Buck, M.D., M.P.H.
Department of Family and Community Medicine, Baylor College of Medicine
3701 Kirby Dr., Suite 600
Houston, TX USA 77098
Telephone: 713-798-7718; Fax: 713-798-7940; Email: dbuck@bcm.edu

References:

1. Boyce WF. Disadvantaged persons' participation in health promotion projects: Some structural dimensions. *Soc Sci Med* 2001; 52(10): 1551-64.
2. Tollett JH and Thomas SP. A theory-based nursing intervention to instil hope in homeless veterans. *ANS Adv Nurs Sci* 1995; 18(2): 76-90.
3. Classen C and Koopman C, Spiegel D. Trauma and dissociation. *Bull Menninger Clin* 1993; 57(2): 178-94.
4. Parcel GS, Simons-Morton B, O'Hara NM, Baranowski T and Wilson B. School promotion of healthful diet and physical activity: Impact on learning outcomes and self-reported behavior. *Health Educ Q* 1989; 16(2): 181-99.
5. Sheeska JD, Woolcott DM and MacKinnon NJ. Social and cognitive theory as a framework to explain intentions to practice healthy eating behaviors. *J App Soc Psychol* 1993; 23(19): 1547-73.
6. Brekke M, Hjortdahl P and Kvien TK. Self-efficacy and health status in rheumatoid arthritis: A two-year longitudinal observational study. *Rheumatology (Oxford)* 2001; 40(4): 387-92.
7. Clarke DO. Physical activity efficacy and effectiveness among older adults and minorities. *Diabetes Care* 1997; 20(7): 1176-82.

8. Blankertz LE and Cnaan RA. Principles of care for dually diagnosed homeless persons: Findings from a demonstration project. *Res Soc Work Pract* 1992; 24(4): 448-64.
9. Morse GA, Calsyn RJ, Miller J, Rosenberg P, West L and Gilliland J. Outreach to homeless mentally ill people: Conceptual and clinical considerations. *Community Ment Health J* 1996; 32(3): 261-74.
10. Jack S, DiCenso A and Lohfeld L. Opening doors: Factors influencing the establishment of a working relationship between paraprofessional home visitors and at-risk families. *Can J Nurs Res* 2002; 34(4): 59-69.
11. Chen ES, Mendonca EA, McKnight LK, Stetson PD, Lei J and Cimino JJ. PalmCIS: A wireless handheld application for satisfying clinician information needs. *J Am Med Inform Assoc* 2004; 11(1): 19-28.
12. Fischer S, Stewart T, Mehta S, Wax R and Lapinsky SE. Handheld computing in medicine. *J Am Med Inform Assoc* 2003; 10(2): 139-49.
13. Pipas CF, Carney PA, Eliassen MS, Mengshol SC, Fall LH, Olson AL, Schifferdecker KE, Russell MT, Peltier DA and Nierenberg DW. Development of a handheld computer documentation system to enhance an integrated primary care clerkship. *Acad Med* 2002; 77(7): 600-9.
14. Wang SJ, Middleton B, Prosser LA, Bardon CG, Spurr CD, Carchidi PJ, Kittler AF, Goldszer RC, Fairchild DG, Sussman AJ, Kuperman GJ and Bates DW. A cost-benefit analysis of medical records in primary care. *Am J Med* 2003; 114(5): 397-403.
15. Penn State Milton S. Hershey Medical Center. Wireless technology may help doctors treat patients. 2003: Accessed 2003 November 12 at: http://www.pdacortex/penn_state.htm.
16. The Secretary's Work Group on Ending Chronic Homelessness. Ending chronic homelessness: Strategies for action. Washington, DC: U.S. Department of Health and Human Services. 2003.
17. Glaser J. Analyzing information technology value. *Healthc Financ Manage* 2003; 57(3): 98-100, 2, 4.
18. Buck DS, Rochon D and Turley JP. Taking it to the streets: Recording medical outreach data on personal digital assistants. *Comput Inform Nurs* 2005; 23(5): 1-6.