Handheld Computers in Clinical Practice: Implementation Strategies and Challenges

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EXECUTIVE SUMMARY

Purpose

This study was designed to explore experiences with handheld computer use in clinical practice from the perspectives of both organizations and practicing physicians. The goal of this study was to develop a rich and useful understanding of organizational strategies for the use of handheld computers, and of the needs and concerns of physicians using these devices for patient care.

Research Questions

1. What specific applications and uses exist for handheld computers in the clinical setting?
2. What strategies and tactics are hospitals using to integrate handheld computers into their patient care delivery practices?
3. What are the attitudes, expectations, and needs of physicians with respect to the use of handheld computers in clinical practice?

Project Overview

Our comprehensive study included eight organizational case studies, nine focus groups, and an integrative review of the literature in order to answer our research questions. We held interviews with 67 organizational representatives as part of our case studies, and our focus groups included 55 physicians as well as 15 other clinicians (physician assistants, dieticians, physical therapists, and pharmacists) and 10 additional organizational informants (a total of nearly 150 respondents over the course of this study).

Key Findings and their Implications for Decision Makers

- **Finding 1:** ***Uses of Handheld Computers in Clinical Practice*****:** There is a diverse and growing list of possible uses for handheld computers in clinical practice. Commonly cited uses include: 1) patient data access, 2) pharmaceutical reference, 3) guideline dissemination, 4) medical calculator functions, and 5) scheduling and appointment reminders. Innovative new uses may include: 1) collection of information about medical errors and near misses; 2) data acquisition through questionnaires or surveys; 3) distribution of databases such as formularies, consultant physician information, pharmacy phone numbers; 4) provider-directed patient education; and 5) clinical uses beyond physicians (e.g., nurse practitioners; nurses; dietary; physician assistants; pharmacy; inventory)

  Implications: ***For Senior Management, Information Technology (IT) Directors, Clinical Managers, Researchers, Quality Improvement Directors:*** As handheld computers become more widely utilized, administrators can leverage their use in a variety of ways to improve both care and service to patients. Administrators can work with interested clinicians to devise creative ways to collect data about patient care and outcomes, as well as appropriately provide information to health care providers in the form of databases, guidelines, and patient education materials. Beyond physicians, opportunities to use handheld computers are also expanding, although these applications may require institutional purchase of devices and software to support new endeavors.

- **Finding 2:** ***Handheld Computer Use Patterns and Characteristics*****:** We were able to categorize handheld computer users into four different groups: 1) non-users (including former users); 2) niche users (restricted to a single application); 3) routine users; and 4) power users.

  Implications: ***For Senior Management, IT Directors, IT Trainers, Clinical Leadership***
  Training and support of handheld computer use is best tailored to the needs and aptitudes of individual physicians. Different strategies are appropriate for different groups. Non-users may need to overcome fear and inexperience with computer technology while power users can be utilized (as peer champions) to help niche users and routine users maximize the benefits of handheld computers.

- **Finding 3:** ***Organizational Implementation and Support Strategies:*** We found three main approaches to organizational support: 1) active promotion, facilitation and support for broad-based applications and devices; 2) active support for niche applications; and 3) passive support for individual users.

  Implications: ***For Senior Management, IT Directors, and Residency Directors***
  Depending on the selected organizational approach to supporting handheld computer use, requirements for investment in capital and information technology support will vary. In addition, the greater the level of support, the more likely handheld computer use can be leveraged for organizational purposes (e.g., access to clinical data; procedure documentation; medical education documentation; patient education; medical error reporting; reducing drug costs). A level of basic support is expected by all physicians, but not all organizations choose to move beyond this level. Interestingly, all eight of our focus groups included incidents when power and/or routine users were able to share tricks and capabilities of the handhelds with their physician peers. For organizations interested in active promotion and support, leveraging the enthusiasm of power users in similar open forums will likely be effective.

- **Finding 4:** ***Barriers Hindering Handheld Computer Use*****:** Both device and personal barriers, including both physical and perceptual constraints, can affect physicians' adoption and use of handheld computers in clinical practice.

  Implications: ***For Senior Management, IT Directors, and Medical Directors***
  While device issues are difficult to address, providing organizational support can help physicians overcome perceptual barriers to use such as comfort with technology and comfort with the device, as well as show dedication to serving physicians.

- **Finding 5:** ***Physician Attitudes*****:** Our study suggests that our physician handheld computer users are largely satisfied, even with limited use. The majority of physician respondents appear interested in leveraging handheld use. They often commented on how they felt they were not utilizing the handhelds to their greatest degree, and would like to gain additional benefit from the technology.

  Implications: ***For Senior Management, IT Directors, Medical Directors***
  Organizations can look for opportunities to expand handheld use for both clinical and administrative processes. Participant physicians suggested that organizations can promote handheld computer use by providing training and re-training to extend user knowledge, user support, and advice to build confidence in this and other information technologies.

- **Finding 6:** ***Physician Needs:*** Commitment to handheld computers requires low capital investment but a strong level of support; physicians particularly desire non-threatening, one-on-one support.

  Implications***: For Senior Management, IT Directors***
  Budget to support handheld computer use should include training, 24x7 help desk, and re-training. Nurse informaticists in IT work particularly well to support physicians one-on-one.

- **Finding 7:** ***Physician Concerns*****:** Physicians are concerned about both device reliability and dependence on the device.

  Implications: ***For IT Directors, Clinical Leadership, Residency Directors***
  Availability of user support through IT may reduce physician anxiety about the device itself. Concern about dependence on the device may need to be acknowledged in the context of medical education and ever-increasing demands for medical knowledge and precision.

- **Finding 8:** ***Physician Expectations:*** Both organizational and physician participants expect handheld computers to become more useful and more common in the future.

  Implications: ***For Senior Management, IT Directors, Medical Directors Residency Directors***
  Newly trained physicians are expected to be more and more comfortable with handheld computers, raising an expectation for organizations themselves to become more handheld-friendly. Developing strategies to leverage handheld computer use such as providing mobile access points to essential point-of-care information will help attract and retain providers who will also be effective users of other clinical information technologies.

Conclusions: For organizations interested in supporting and promoting information technology solutions to improve clinical practice, understanding the implications of our work on handheld computers can help them in other technology implementation projects. In particular, the critical role of clinical change agents can be leveraged to promote and expand technology diffusion among physicians often uninterested in new information technologies. Further, findings from our study show how the relatively inexpensive option of accommodating handheld computers can successfully facilitate both organizational and individual change as organizations attempt to bring more IT to the point of care and support a digital patient care environment.