



Practice Efficiency Improvements Resulting from the Use of Medtronic CareLink® Network Remote Monitoring Service

On behalf of Medtronic, Inc., Human Factors International conducted a comparative analysis at four cardiology clinics in mid-2004, measuring average times required for in-office device checks versus remote follow-ups with the Medtronic CareLink® Network, an Internet-based remote monitoring service in clinical use since 2002.*

Objectives

To determine the efficiency increases associated with adoption of the Medtronic CareLink Network for routine ICD and CRT-D checks in four U.S. clinics. Specific objectives included:

- Measure the time differential between in-office device checks versus remote device follow-ups with the Medtronic CareLink Network
- Observe clinic effectiveness practices
- Use statistically relevant samples to assess resulting clinic efficiency

Participants

Four clinics were chosen from across the United States. Selection ensured that each clinic had a large number of both Medtronic CareLink Network patients and in-office device patients. The clinics ranged in size and type.

The participating clinics were:

- Cardiology Consultants (Newark, Delaware)
- Cardiac Diagnostics (York, Pennsylvania)
- Mid-Ohio Cardiology (Columbus, Ohio)
- Northwest Florida Heart Group (Pensacola, Florida)

Methods

Times were recorded for a total of 27 in-office visits and 30 remote follow-ups, each organized into seven process steps: pre-visit, check-in, initial screen, triage, charting, checkout, and physician procedures for in-office visits; pre-visit, batch selection of patients and reports, batch printing, data review, charting, patient calls, and physician procedures for Medtronic CareLink transmissions.

Results

On average, Medtronic CareLink remote follow-ups took 7.8 minutes versus 22.2 minutes for in-office visits (see Figure 1), an average efficiency increase of 65% for all sites. In every case, Medtronic CareLink transmissions were processed more quickly than in-office visits. The efficiency increases ranged from 44% to 80%, as is shown in the table below.

Patient Type	Percent Efficiency Increase when Using Medtronic CareLink Network
All Patients	65%
Patients with Episodes	44%
Patients without Episodes	77%
Single Chamber	70%
Dual Chamber	71%
CRT Patients	80%

If only routine Medtronic CareLink follow-ups are considered (not patients with episodes) the average efficiency increase is 77%. Efficiency gains were greatest (80%) for CRT patients and least (44%) for patients presenting with episodes (see Figure 2). Time savings were greatest for the initial screening and triage stages

(see Figure 3).

Conclusions

At all four clinics, across all patients and clinical situations reviewed, overall processing time for remote Medtronic CareLink transmissions was significantly faster than for in-office checks. A measurable increase in clinic efficiency was consistently documented. Physician procedure time was similar for in-office checks and Medtronic CareLink follow-ups.

Medtronic CareLink transmissions are significantly faster to process than in-office checks

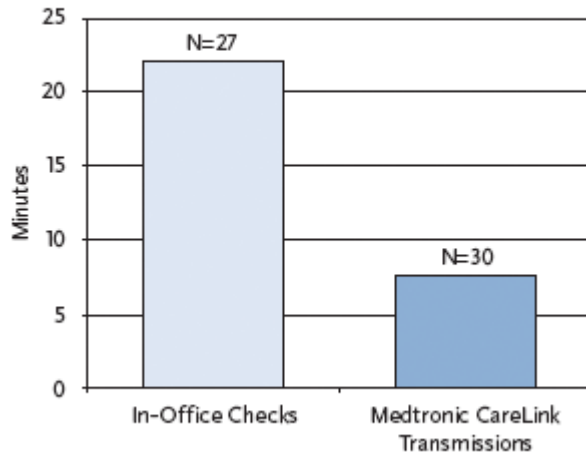


Figure 1: On average, traditional in-office device check appointments lasted 22.2 minutes. In comparison, processing Medtronic CareLink patients was significantly faster, taking only 7.8 minutes.

Efficiency increase is greater for patients presenting without episodes

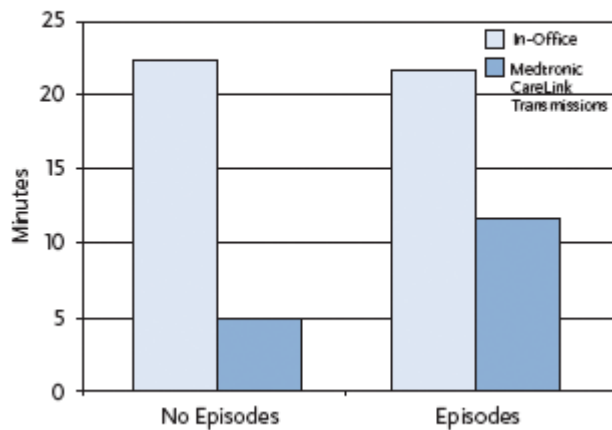


Figure 2: The efficiency provided by the Medtronic CareLink Network diminishes somewhat when patients present with episodes.

Medtronic CareLink Network is more efficient at various stages of the device check process

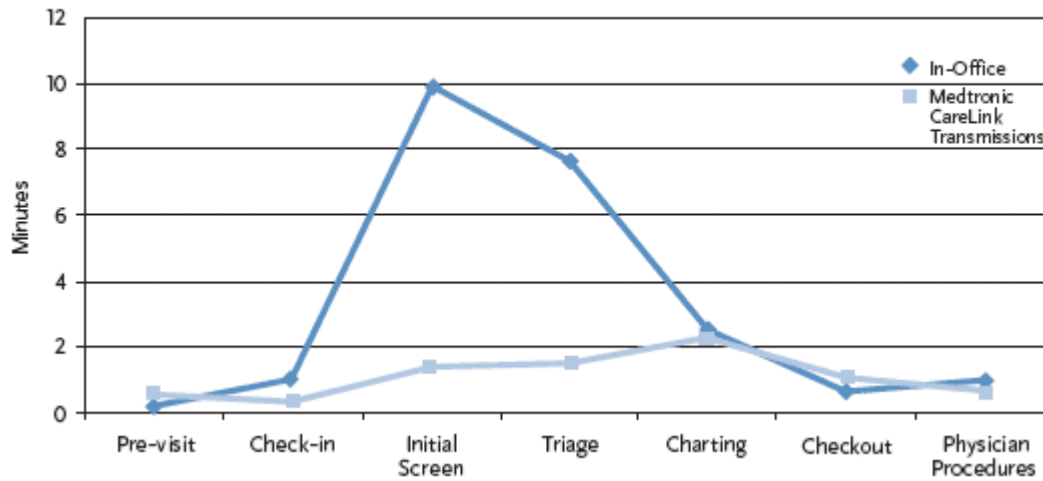


Figure 3: Patient processing time with the Medtronic CareLink Network is equal to or more efficient than in-office patient processing for each step. The greatest time savings occur at the initial screening and triage stages.

Reference

* Falk D, Straub K. Practice efficiency improvements resulting from the use of Medtronic CareLink Network remote monitoring service. Fairfield, Iowa: Human Factors International, July 2004.

Brief Statement: Medtronic CareLink® Monitor/Medtronic CareLink® Network

Intended Use

The Medtronic CareLink Monitor and the Medtronic CareLink Network are indicated for use in the transfer of patient data from some Medtronic implantable cardiac devices based on physician instructions and as described in the product manual. These products are not a substitute for appropriate medical attention in the event of an emergency and should only be used as directed by a physician.

Contraindications

There are no contraindications for the Medtronic CareLink Monitor.

Warnings and Precautions

The Medtronic CareLink Monitor must only be used for interrogating compatible Medtronic implantable devices. The Medtronic CareLink Monitor is intended for use within the prescribing country.

See the device manual for detailed information regarding the instructions for use, indications, contraindications, warnings, precautions, and potential complications/adverse events. For further information, please call Medtronic at 1 (800) 328-2518 and/or consult Medtronic's website at www.medtronic.com.

Caution: Federal law (USA) restricts this device to sale by or on the order of a physician.