MyCareTeam Internet Site for Home Peritoneal Dialysis Patients

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In 1997 more than 360,000 people in the United States were diagnosed with end-stage renal disease (ESRD) resulting from one of three primary diseases: diabetes, hypertension, or glomerulonephritis. There were approximately 58,000 deaths attributed to ESRD and more than $15 billion spent (both public and private funds) to treat the disease. Of the more than 360,000 patients with ESRD, about 61 percent utilize some form of dialysis, but only about 7.5 percent use peritoneal dialysis (PD)[1].

The MyCareTeam Internet Site for patients with ESRD is an extension of our telemedicine for hemodialysis project, Project Phoenix. Patients on hemodialysis travel to a hemodialysis center an average of three times a week; 4 to 5 hours of hemodialysis are performed at each session. Patients on PD perform dialysis in their own homes every night for between 8 and 12 hours. They can do this while they are sleeping and therefore are free during the daytime to carry out their normal routines.

Patients performing PD are responsible for performing scheduled cycles of PD and delivering prescribed volumes of peritoneal fluid. Since these patients provide their own dialysis, they are at increased risk for infection or other occurrences that might not be recognized right away. Patients' compliance with the PD prescription and recognition of initial stages of complications are critical to their continued success and health maintenance.

PD patients routinely visit the clinic once each month. If problems are encountered between visits, they can contact their clinicians or wait until their next visit. With the improvements in technology and advances in home communications, the technology exists to better monitor these patients and ensure they are delivering the proper prescriptions. MyCareTeam provides a stronger link between the patient and the care team without additional burden to the patient.

The MyCareTeam Web site, developed by the Imaging Science and Information Systems Research Center at the Georgetown University Medical Center, focuses on improving the health outcomes of patients with chronic diseases, specifically patients with ESRD currently on PD. This is accomplished through improved disease management, self-management, and education.

The self-monitoring tools, educational resources, and online support communities available at the MyCareTeam Web site help people with ESRD take control of their health. The mechanisms provided for improving health outcomes include:

- Improved patient compliance through education
- Prevention of complications through swift and effective intervention
- Provision of a full continuum of care
- Integrated data management

Our unique approach to chronic illness management is shown in Figure 1. The unique features of the site are that it:

- is a patient-centric Web design,
- is an interactive Web site,
- improves access to the clinical care team, and
- provides secondary support activities.

This site provides secure personalized information to patient participants. Patient data are displayed at the request of the patient and include PD parameters and clinical data acquired from the PD dialyzer (as shown in Figure 1); analysis of the PD parameters and clinical data; lab values; current PD prescription; and reminders of appointments, tests, and other scheduled needs of the patient. There is also a range of educational and training information provided, such as details on nutrition and exercise, as well as e-mail communication capabilities with the care team and other MyCareTeam PD patient members.

Three HomeChoice Pro PD devices were installed for three different patients. New telephone lines were installed in their homes so that the use of the HomeChoice Pro and Internet access would not interfere with their normal telephones. The operational protocol for this project is that patients perform their PD as required using the HomeChoice Pro device.

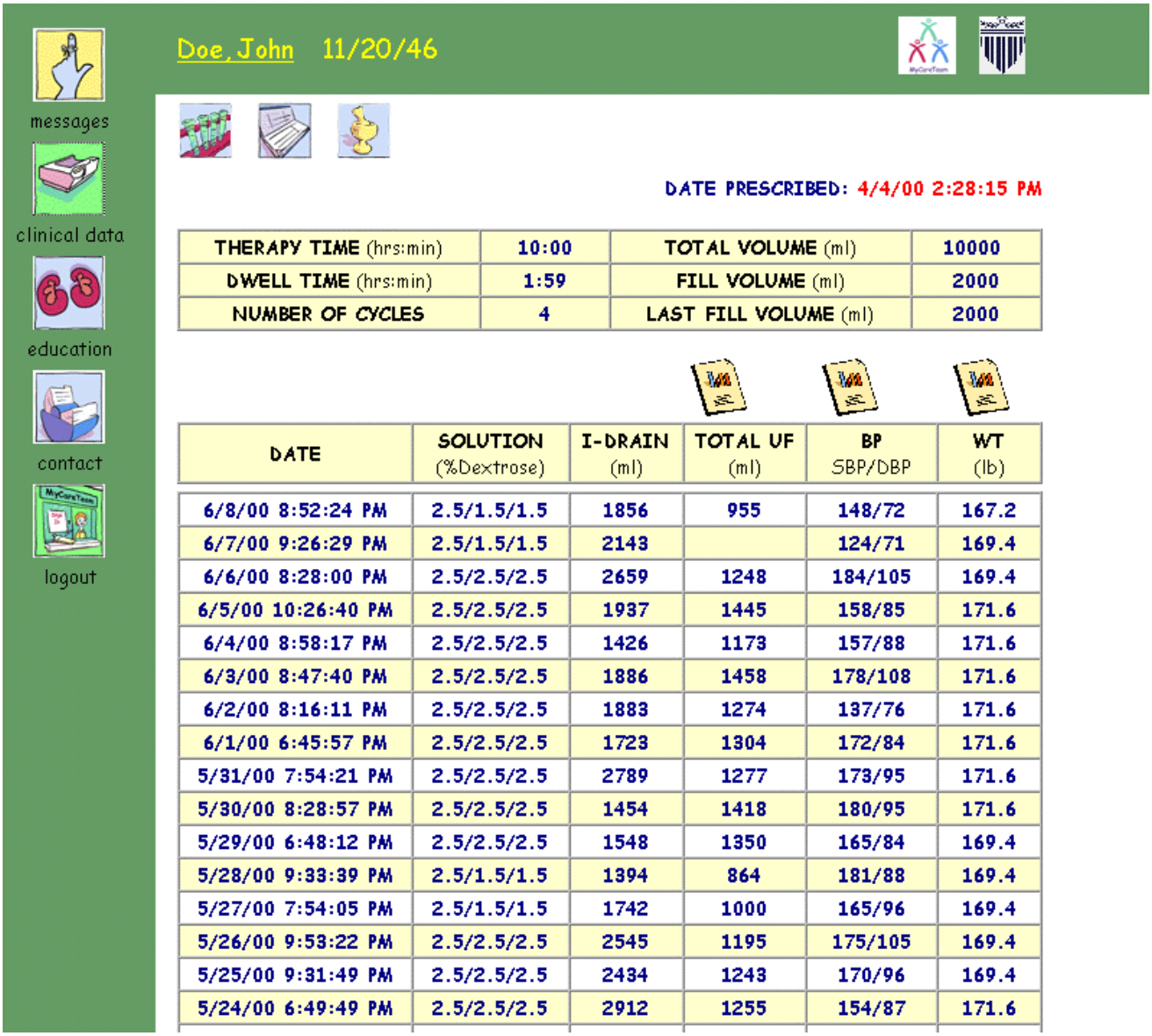
The patients conduct their individual sessions as follows:

- Before starting each dialysis session, the HomeChoice Pro device prompts them to enter their predialysis weight and blood pressure.
- Once the dialysis session is completed, patients disconnect themselves from the device and set the device in "modem-connecting" mode.
- Once the device is set in modem-connecting mode, PD nurses can capture data anytime

within an 8-hour period. There is no need for the patient and nurse to coordinate capture of the data.

- The parameters are downloaded to a database maintained by Baxter Healthcare software and transferred to the MyCareTeam secure database.

The benefit of using the HomeChoice Pro rather than standard PD dialysis devices is that the HomeChoice Pro device uses a flashcard to store the PD parameters from each session. The flashcard can hold about 60 sessions or about 2 months worth of data. Standard dialyzers require patients to maintain a paper log of the parameters from their dialysis sessions, including tracking their predialysis weights and blood pressures. The HomeChoice Pro can track all that for patients, who no longer have to remember to bring a paper log to their clinic visits. The care team has daily access to the PD parameters if needed.



THERAPY TIME (hrs:min)	10:00	TOTAL VOLUME (ml)	10000
DWELL TIME (hrs:min)	1:59	FILL VOLUME (ml)	2000
NUMBER OF CYCLES	4	LAST FILL VOLUME (ml)	2000

DATE	SOLUTION (%Dextrose)	I-DRAIN (ml)	TOTAL UF (ml)	BP SBP/DBP	WT (lb)
6/8/00 8:52:24 PM	2.5/1.5/1.5	1856	955	148/72	167.2
6/7/00 9:26:29 PM	2.5/1.5/1.5	2143		124/71	169.4
6/6/00 8:28:00 PM	2.5/2.5/2.5	2659	1248	184/105	169.4
6/5/00 10:26:40 PM	2.5/2.5/2.5	1937	1445	158/85	171.6
6/4/00 8:58:17 PM	2.5/2.5/2.5	1426	1173	157/88	171.6
6/3/00 8:47:40 PM	2.5/2.5/2.5	1886	1458	178/108	171.6
6/2/00 8:16:11 PM	2.5/2.5/2.5	1883	1274	137/76	171.6
6/1/00 6:45:57 PM	2.5/2.5/2.5	1723	1304	172/84	171.6
5/31/00 7:54:21 PM	2.5/2.5/2.5	2789	1277	173/95	171.6
5/30/00 8:28:57 PM	2.5/2.5/2.5	1454	1418	180/95	171.6
5/29/00 6:48:12 PM	2.5/2.5/2.5	1548	1350	165/84	169.4
5/28/00 9:33:39 PM	2.5/1.5/1.5	1394	864	181/88	169.4
5/27/00 7:54:05 PM	2.5/1.5/1.5	1742	1000	165/96	169.4
5/26/00 9:53:22 PM	2.5/2.5/2.5	2545	1195	175/105	169.4
5/25/00 9:31:49 PM	2.5/2.5/2.5	2434	1243	170/96	169.4
5/24/00 6:49:49 PM	2.5/2.5/2.5	2912	1255	154/87	171.6

Figure 1. A MyCareTeam Flow Sheet for a Peritoneal Dialysis Patient

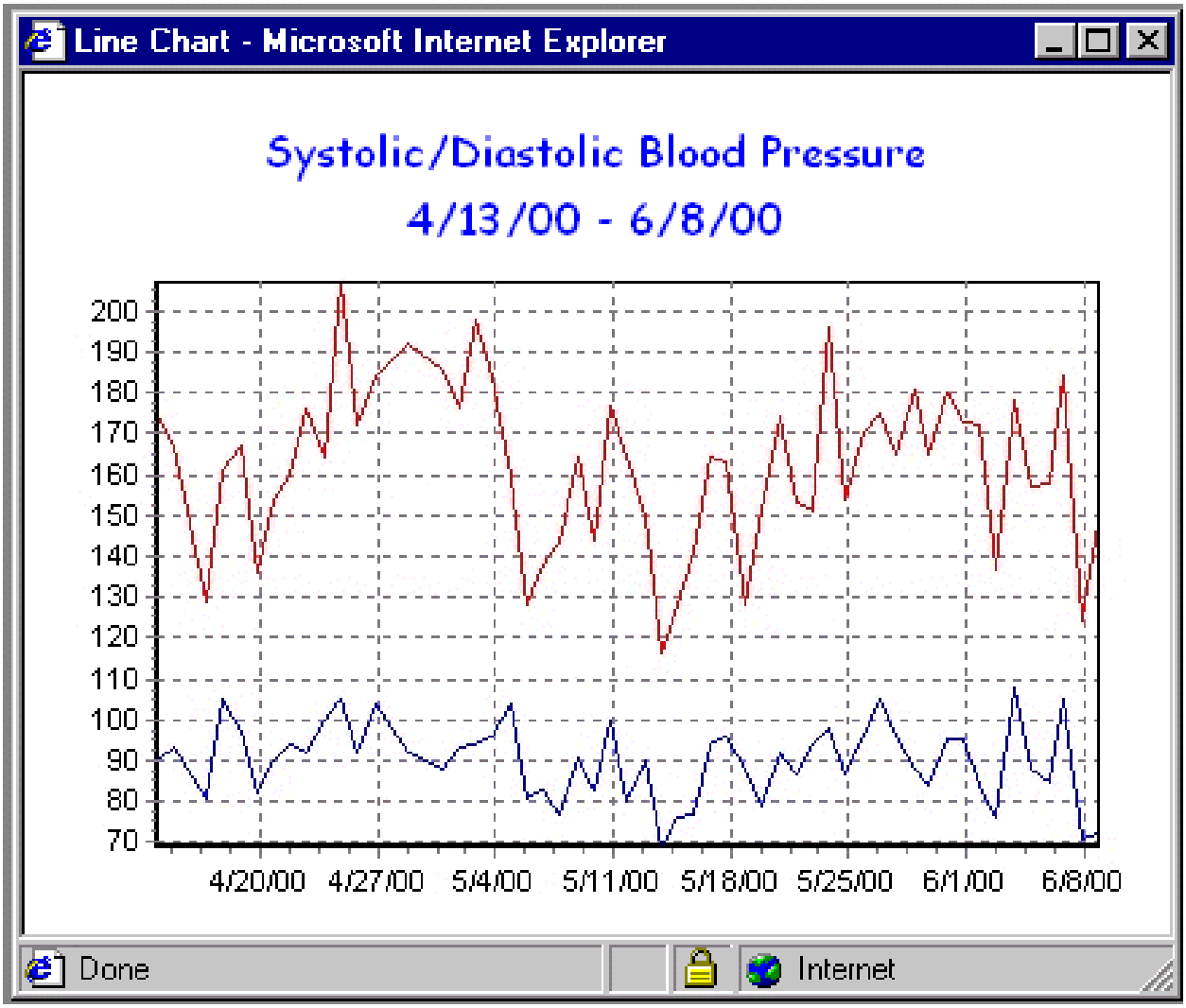


Figure 2. Blood Pressure Graph for a Peritoneal Dialysis Patient

Once the data have been downloaded, the patients have access to their PD and other clinical data, including lab results, using standard Web browser technologies. Graphical and statistical representations of their vital signs and PD data highlight areas of concern and identify patterns in patient data (see Figure 2). Patients are automatically notified of lab values, PD parameters, and vital signs that are outside of identified target ranges. The site is interfaced to the Baxter HomeChoice Pro software and thus allows the nephrologist and PD nurses to have access to the patient data in either system and evaluate the patient's condition between scheduled office visits. This allows for the identification of areas of concern before they become serious problems.

SUMMARY

The site has been active since May 2000, and we continue to capture data for our PD patients. We have received positive feedback from the patients and the clinical care team. The patients have stressed that they feel more comfortable knowing that someone is evaluating their PD sessions between office visits. They also feel a sense of relief from manually documenting their PD sessions, since this information is collected automatically.

REFERENCE

1. *United States Renal Data System 1999 Annual Data Report.* National Institute of Diabetes and Digestive and Kidney Diseases, National Institutes of Health, U.S. Department of Health and Human Services, 1999.

ACKNOWLEDGMENT

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