

SI 622

Evaluation of Systems and Services

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Personas and Scenarios

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1. Overview

We have developed archetypical personas and scenarios for physicians, nurses, and other staff who use CareWeb, the electronic medical system of the University of Michigan Health System (UMHS). The staff at the hospitals and clinics that comprise UMHS all have access to CareWeb, which is the main interface to the Central Data Repository (CDR). CareWeb allows its users to:

- Search for individual patient records and caregivers
- Access clinic and caregiver schedules
- View, create, edit, and sign free-text patient encounter notes
- View lab results, including EKG's and radiology reports
- Organize patient records into lists

CareWeb's complex functionality must be understood within the context of actual users' workflows. With personas and scenarios that bring life to these users, our group as evaluators can better understand the target audience's needs and goals.

2. Personas & Scenarios

This document details the personas and scenarios developed as part of the evaluation of CareWeb. In order to obtain a range of user profiles, our group has interviewed six members of the University of Michigan Hospital staff holding a variety of job positions. Our interviewees included a doctor of internal medicine, a kidney transplant consultant, one inpatient and one outpatient experienced nurse, a newly registered nurse, and a social worker. In the interviews our aim was to gain an understanding of the details of each user's specific job profile within the hospital, their usage of CareWeb, and the general workflow. All personas in this report are based on the characteristics of people represented by our interviewees, and all scenarios are based on our understanding of potential CareWeb usage, current solutions and frustrations, the general hospital workflow, and relevant relationships with other users.

All images for the personas were obtained as a result of Google image search.

Our group's compiled interview notes are presented in Appendix A.

1

The confident transplant consultant

Dr. Jack Shephard Kidney Transplant Consultant



"CareWeb helps me keep on track."

Personal Profile

Dr. Jack Shephard received his MD degree from the University of Pennsylvania Medical School, and went on to specialize in transplant surgery. He has been working at the University of Michigan Hospital for the past 14 years as a kidney transplant consultant. His job is demanding; transplant patients require careful monitoring and cautious decision-making.

Dr. Shephard works closely with transplant surgeons in caring for his patients. He spends most of his days in clinics and working with in-patients. He needs to keep a close watch on lab results and transplant evaluations to keep track of each patient's progress. Kidney transplant patients often get referred from

other clinics and hospitals for surgery and treatment, so he needs to make sure he gets all patient history information from these outside facilities in order to provide the best care.

Dr. Shephard finds his job very rewarding, and after so many years on the job he feels the same enthusiasm and energy as he did when he first started out. He believes that morale is very important for patients in getting through their difficult condition and does his best to keep their spirits up. He usually has a hectic schedule, so in his free time he likes to rest at home and spend time with his family. He has an interest in foreign and independent movies, and enjoys the French cuisine and an occasional glass of red wine at dinner. He likes playing golf in the summer.

Biographical:

- Grew up in Colorado Springs and went to Cornell University as an undergraduate
- 48 years old
- Wife, Sarah, is a psychologist
- Has a son who started college and a daughter in high school
- Likes animals, has a cat named Sammie
- Self-confident and energetic
- Soft-spoken and taciturn

Computer Literacy and Access:

- Fairly confident with computers, uses most of the basic applications

- Uses the Web to search for medical information and newly published journal papers to keep up-to-date
- Has a computer in his office at the hospital
- Uses laptop at home for e-mails and access to CareWeb

Needs:

- Quick and easy access to patients' lab results and transplant evaluation notes
- Patient information from other providers, such as the physicians in cardiology and radiology
- Access to patient documents from outside hospitals and clinics

Goals:

- To collaborate with others on the nephrology and transplant teams, as well as providers in other medical departments, to try and make the best decisions for the kidney transplant candidates and patients who have undergone transplant, according to their current condition and daily progress
- To make the transplant process go as smoothly as possible for the patients and their families by keeping their morales high

2 The new RN

Mary Ann Lynd Inpatient RN



“CareWeb is more of a reference.”

Personal Profile

In her third year in college, Mary realized that she wanted to care more for children instead of teaching them so she switched from elementary ed to nursing. Mary recently passed her boards and received a generous offer to join the nursing staff at C.S. Mott Children’s Hospital.

The past three weeks has been insane, but she loves it. She picked Mott Hospital because of their focus on child care and the opportunity of working in the neonatal unit. So far she has been managing only 2 patients – she is pestering the chief nurse to assign her more; it’s always a treat for her to hear the kids say ‘thank you.’

The training sessions have been a little taxing for Mary so the 2 hour session on the hospital’s electronic record system – Careweb – was a welcome reprieve. She finds

the system intuitive and thinks it’s funny that some of the other nurses have complaints about it. She has noticed that it would be a pain in the neck when she has more patients, since switching between patients records can be one too many clicks. She, however, likes the fact that she can access her patients’ medical histories; although she would like it better if the careplans were also available in CareWeb.

Her friends call her ‘Mal’ because it’s an acronym for her full name...and she likes to tell stories of disgusting things that happens at work. She enjoys hanging out with them, which makes her dread the night shifts which the newbies get stuck with once orientation is over. She is considering signing up for one of those 12 hour shifts for 3 days a week programs so she can keep in touch with her friends.

Biographical:

- 27 year-old, single woman
- BSN from College of Nursing, Michigan State University. Licensed for practice in Michigan
- Rents 2 bedroom apartment close to downtown; no roommate
- Completed 3 marathons
- Self described ‘prankster’
- Caring & sympathetic
- Able to take orders and give them

Computer Literacy & Access:

- Comfortable with computers
- Uses Instant Messaging to keep in touch with friends at home

- Participates in online scrap-booking and gardening forums

Needs:

- Easy to use system
- Single place to look up patient information (both current and past history)

Goals:

- Provide better care for her patients by being as informed as she can about their conditions and treatment plan
- To maximize contact time with patients
- To become a member of the neo-natal unit nursing team

3

Senior RN

Katherine Mason [Clinical Nurse II, Transplant Administration]



“CareWeb has everything I need, but sometimes the information is outdated.”

Personal Profile

It has been 14 years since Kathy came to University of Michigan Hospital after she got her nursing certificate. Despite the brisk winter, she loves Ann Arbor and never thought about leaving it. She currently works in the transplant department.

Kathy spends most of her working hours visiting patients and reviewing their files. You can find her trotting between the nursing station and clinic rooms all the time. She keeps track of the patients’ physical condition and treatment history, before and after the surgery. “We need to make sure that the new organ is functioning without being rejected by patients’ body” said Kathy. In addition to the inpatients, she also regularly

calls on outpatients to check how they are doing after surgery.

Kathy is very cautious about the accuracy of information. Although Kathy likes the fact that CareWeb contains all the information that she needs, she has noticed that sometimes it provides outdated data. Because of that, her department has developed another database system called OTIS¹ “Now we use both OTIS and CareWeb, one for reviewing the lab results and doctors’ notes, the other for patient demographics and our own notes” said Kathy.

Kathy is very flexible in doing her tasks. She knows there will always be work-around methods to use. There was one time when the computer system crashed and there were no medical records available. Kathy solved the problem by running to each of the departments to get paper copies of the documents. “As long as the data is right, it doesn’t matter how I get it” said Kathy.

When off duty, Kathy goes to a Tai-Chi class once a week. “Tai-Chi helps me relax both physically and mentally, and prepares for the following busy week” said Kathy.

Biographical

- 40 year-old female, married woman with a 7 year-old kid
- Graduated from School Nurse Certificate program, University of Illinois
- Lives in a house 1.5 miles away from the hospital
- 14 years experience as a nurse

Computer Literacy & Access

- Uses the medical record system a lot in her job
- Feels comfortable with the computer system of the hospital
- Checks emails and sometimes reads news on the internet
- Needs help when installing new software or when the computer crashes

Needs

- Real-time updates of lab results
- Accurate patients’ demographics
- Clear layout of lab results (in spreadsheets)
- Single database for all the current information

Goals

- To be able to monitor patients’ physical conditions
- To be able to locate medical records easily

¹. OTIS (Organ Transplant Information System) is the database system used only in transplant department

4

Time-pressed social worker

Nancy Anderson

LISCW [Kidney Transplant]



“CareWeb helps me monitor my patients’ medical situation and document my own interactions.”

Personal Profile

Nancy Anderson, LISCW, has been a social worker in the University’s transplant group for the past eight years. Lately, Nancy works mostly with the kidney transplant group but has rotated through various transplant groups including liver and heart. Nancy is an active member of the caregiving team and becomes involved with initial assessment of the patient’s preparedness for the transplant and stays involved with out-patient care after the transplant to help ensure that the patient’s lifestyle gives the best chance of survival for their new organ.

On a day-to-day basis, Anderson works as a bridge between the medical situation, patients’ behavior, and such practical matters as patients’ insurance status. Most days, she finds this to be high on job satisfaction – she likes working with people,

and for many of her patients, a new organ is a huge relief from their current situation. Some days can be particularly frustrating, though, such as when she has to work with a noncompliant patient or someone who has lost access to insurance coverage.

She is constantly using CareWeb – “it feels like it’s all I do!” she says – to access other caregivers’ notes, add documentation of her own, to look up patient demographics, and to organize her patient lists.

Nancy also has been having more and more trouble keeping her job separate from her home life. In her position, she must work with the patients and their families to be successful, and can become caught up in the emotions they go through. When a patient has a problem, she is not always able to leave it at work.

Her husband, who works at a local marketing company, has noticed this. He’s noticed that she takes more work calls at home, and two or three nights a week, Nancy will bring her laptop into bed to finish making some patient notes.

When Nancy gets a lot of time away from work, she and her husband like to travel. Over the past few years, they have been making a tour of European capitals, but still have a few more to go. For everyday downtime, though, Nancy enjoys running (she used to help coach her son’s cross country team) or going out to eat with friends.

Biographical

- Originally from outside of Pittsburg, PA
- 52 years old
- Husband, Sam, works in print and interactive marketing
- Two kids, both in college
- Gregarious and outgoing
- Quick to laugh, and makes everyone feel at ease

Computer Literacy & Access

- Uses laptop at home for primarily for e-mail and CareWeb.
- Lately has been using Flickr and other tools to keep in touch with her children and extended family
- She has a computer in her office, but during clinic days, uses computers in hallways in the clinic or waits to access CareWeb until she is back at her office or home.

Needs

- Quick and easy access to patients’ labs and other caregivers’ notes
- Information that is not purely medical: what about the patient’s behavior and lifestyle and life situation will help the transplant succeed in the long term?

Goals

- Access the information she needs to help patients and their families make the best of the transplant experience.
- Provide the doctors and nurses with information that will help them provide the best possible treatment.

5 autonomous resident

Tina Lee, MD

Instructor in Internal Medicine, University of Michigan Medical School



"I take pride in my decisions that lead to others' well-being."

Personal Profile

Tina just finished her three-year residency at the University of Michigan. She has recently begun a full-time hospitalist appointment with the University of Michigan Health System, which means that she spends 6 months of the year in the inpatient ward, 2 months in outpatient consult, and 50 half-days in clinics.

As an internal medicine physician, she likes the regularity of seeing the same patients in a primary care clinic, yet she finds pre-operative clinics interesting and challenging as well. In a pre-operative clinic, Tina assesses the patient's readiness for a scheduled operation and determines risk factors based on the patient's health and high-percentage complications of the

procedure. In the pre-operative clinic, patients are scheduled for 45-minute time slots instead of 30-minute slots, so she has a little bit more time to prepare and see the patient. As the oldest of four children, Tina enjoys the one-on-one interaction, and the autonomy of making decisions for others' care.

In general, Tina doesn't find CareWeb, the electronic medical record, very difficult to use, except when she is attempting to compare lab results or has to wait to see notes just entered show up in the system. However, she wishes she could spend less time on the computer, and more time with patients.

Tina grew up on Long Island to parents who owned a takeout Chinese restaurant. She excelled in the sciences early on, later spent her undergraduate years studying at the library to get into medical school. Tina and her husband, who is also a physician at the University of Michigan, have lived in Ann Arbor for the past three years. She enjoys cooking, and works out at the local YMCA twice a week.

Biographical:

- 32 year-old female
- Education: MD, State University of New York at Stony Brook
- Currently a senior staff resident at University of Michigan Health System
- Married to a podiatrist at the university
- First generation Chinese who grew up on Long Island, NY

- Known to her co-residents for her grace under pressure

Computer Literacy and Access:

- Not as technologically experienced as peers until she went to SUNY Stony Brook for undergrad and was regularly exposed to computers
- Currently uses her desktop at home for email and online shopping, in addition to accessing CareWeb to prepare for patient visits and write notes
- Has to use features on her own herself a few times before mastering them

Needs:

- Real-time updates of lab results and notes
- Easy way to navigate and compare notes and results from variety of departments

Goals:

- To make sure that her encounter with the patient is recorded soon after the visit
- To assess the patients' condition and readiness for a procedure from the medical record and asking the patient

Scenario 1: Dr. Shephard's good news to Mrs. Moore

Dr. Shephard begins his workday around 7:00am. He comes into his office and logs into CareWeb to go over patient profiles to refresh his memory. He values the quiet time to consider his patients' progress so he can make better decisions. Today he is particularly concerned about one of his patients, Mrs. Moore, who was recently transferred to the University of Michigan Hospital from Saint Joseph Mercy for a right kidney transplant. Mrs. Moore is 47 years old and her sister, Betsy, has already been confirmed as her potential donor by earlier tests. However, Mrs. Moore's health condition now requires careful assessment before the transplant team can go ahead with the surgery.

Among other things, Dr. Shephard needs to consider Mrs. Moore's medical history, her physical exam, blood tests, cardiac evaluation, chest X-ray, EKG, and Mantoux test for tuberculosis. Potential transplant patients need to be free of infections and cancer since the immunosuppressants used for the transplant will worsen both. Mrs. Moore is over 40 years old, so Dr. Shephard will need to consider her most recent mammography results, as well as the results of her Pap test and pelvic exam. He knows that he can find some of this information in documents from Saint Joseph Mercy that were scanned and could be viewed at Imaged Documents in CareWeb. He easily finds her mammography, Pap test and pelvic exam results from these documents, reviews them again, and is happy that the results will not affect the transplant. Dr. Shephard then goes into his Results Inbox and searches for the results of the Mantoux test, which had been ordered for Mrs. Moore two days ago, by using her registration number to locate her file. He finds that the lab test for TB is in, and that it is negative. He then goes into Rad/Nuc Results in CareWeb to view her X-ray results. He clicks on the "requisition number" to get to the written interpretation of the test, and finds that everything looks okay for a transplant. However, Dr. Shephard's biggest concern is the results of the cardiac evaluation, because Mrs. Moore is diabetic. He finds that the results of this particular evaluation are not in yet, so he decides to begin his daily rounds before checking back into CareWeb later in the day.

Dr. Shephard spends the morning visiting his patients and returns to his office after lunch to check back into CareWeb to see if the cardiac evaluation results for Mrs. Moore are in, and whether there are any notes from Cardiology pertaining to her condition and the possible transplant. This time the results are in. After going through several notes, he locates Dr. Wilson's note about Mrs. Moore's condition. Dr. Wilson has written some precautions and personal feedback on the cardiac evaluation. They will need to be careful, but the transplant can move forward from Cardiology's point of view. Dr. Shephard is happy and wants to put his own notes regarding Mrs. Moore's latest evaluation into CareWeb. The word processing in CareWeb is not very good, so he usually writes everything in FileMaker and then cuts and pastes into CareWeb. He finds this a little annoying, but he does like to use the spell-check and auto-complete options in other word processors as he tends to be very detail-oriented and organized. However, he is happy today because he can now give some good news to Mrs. Moore and her family.

Goals:

- To make sure that the transplant candidate meets all criteria through various tests and evaluations before the decision to move forward with the transplant can be made.
- To locate the necessary results and notes by using the various features of CareWeb.

Scenario 2. Mary takes over Nurse Betty's patients

This morning is hectic, as usual. Mary just picked-up an extra shift via her GroupWise email account – there was also a notice about a National League for Nursing rep speaking at lunch, which she reminded herself to attend later.

Nurse Betty called in sick so Mary got 3 of her patients – 2 boys and a girl. Mary spent 20 minutes of the morning taking care of her patients – telling stories, taking temperature and administering medications. She then went to see nurse Betty's patients.

Since she had not had any contact with these kids, she spent some time going through their careplan, which had notes on what she needed to do with them. To get a better understanding, she went to the staff room to look up the patients' CareWeb files. The room was full and the computers were occupied, so she found another one out in the hall way and looked up their general patient and medication history. The lab results for the girl showed a positive for type 1 diabetes.

This saddened Mary. She made a note not to pass the girl candy like she does with her other patients. According to her watch, she was running slightly behind so she logged out and went to the 4th floor where Betty's patients were.

Goals:

- Provide better care for her patients by being as informed as she can about their conditions and treatment plan
- To maximize contact time with patients
- To become a member of the neo-natal unit nursing team

Scenario 3: Kathy wants to send Mr. Anderson home

It was 9:15 in the morning. As busy as always, Kathy trotted into the nurse station and logged into OTIS and CareWeb. Before she could review the patients she was going to visit today, she needed to copy her notes for a patient, Jennifer B. Moore, from OTIS to CareWeb so that Dr. Shephard could read it. Kathy opened her note in OTIS and copied it into CareWeb.

Kathy searched for the patient record in CareWeb and checked to see if there were any new lab results added into the system. Then she checked her notes in OTIS. According to her notes, Mr. Anderson was supposed to have the ultrasound test of the transplanted kidney at 9:00AM but he didn't show up. Kathy switched to the CareWeb window and looked for Mr. Anderson's phone number in "Patient Demographic" section. She called the number in Mr. Anderson's record and found that his number was no longer in service. "Again?", Kathy said. She thought that Mr. Anderson probably had moved, but CareWeb only had the contact information he provided the first time he came in.

Kathy went to the file room and tried to look for any recent forms that Mr. Anderson might have written his contact information on. However, she didn't find any. She felt a bit upset but there was nothing she could do.

Fortunately, Mr. Anderson came at 10:20AM. Kathy asked him to have the ultrasound test and come back for the result.

10 minutes later Mr. Anderson came back. Kathy clicked on "lab results" on CareWeb, but the report had not been added yet. Kathy went to the Radiology Department and checked the test result because she knew that it would take around 15~20 minutes before the test result was updated on CareWeb. Kathy got the result and it looked fine. Therefore, Kathy let him go home and continued reviewing the patients' records.

Goals:

- To be able to add the notes to both CareWeb and OTIS at once
- To retrieve correct information of patients' demographic information
- To get real-time updated information of lab results

Scenario 4. Nancy reads between the lines and feels that something is missing

Nancy is in her office, reviewing a patient's latest notes on CareWeb in preparation for an appointment. She notes the medical information and is surprised to see that the patient has been noncompliant with her medication. This seems very surprising for a patient who has been handling his transplant very responsibly.

The note on CareWeb does not contain any more information, but reading between the lines, Nancy decides something else must be going on with the patient. She looks up the contact information for the RN who entered the note and pages her.

A few minutes later, the nurse, Kathy Mason, calls back from the staff room. She does not immediately recall the details of the patient's visit, and asks Nancy to hold on for a moment. On the other end of the phone, the Kathy moves to an open computer in the staff room. She clicks to log the previous user out while making small talk with Nancy. Once the system is logged out, Kathy logs herself into the computer and opens CareWeb. She searches for the patient and reads her note to refresh her memory. It takes a few moments, but she eventually recalls the visit.

“Oh, right... this is a sad one. He'd been paying for medication with his wife's insurance, but she was laid off a few months ago and the COBRA benefits just expired. He's still taking his medication, but took it upon himself to decided to ration it out to save on money since he has to pay out of pocket now.”

Nancy asks a few more quick questions while making some notes to herself. She thanks Kathy and hangs up. Nancy takes a few minutes to look at her file on the patient and brainstorms a few alternative insurance options for the patient. When she calls him, she is ready with a few suggestions, and reminds the patient that it is important that he not only take the medication but also take it at the prescribed dosage. At the end of the call, the patient agrees and says he will look into the other options. Nancy tells him to call if he has any questions, hangs up, and opens her patient list to prepare for her next call.

Goals

- Nancy: Understand not only that the patient has been non compliant with his medication but also understand *why*.
- Nancy: Know enough background to have suggestions ready for the patient when she calls him.
- Kathy: Document the relevant medical details of each visit.
- Kathy: Not clutter up the patient's CareWeb record with too many extraneous details.
- Kathy: Be able to quickly recall details of a patient's visit in case someone has questions.

Scenario 5. Tina reviews CareWeb documents in a pinch

Tina rarely runs late, and this afternoon was no exception. She had already spent an hour reviewing the records on CareWeb for her five patients; two were scheduled for knee surgery, two for bypass surgery, and one for a hip replacement.

She brings her new laptop to the Taubman Outpatient Center, where she has a half-day afternoon pre-operative clinic. She arrives at the Area B staff room on the third floor of Taubman at a few minutes before her start time at 1pm. Six residents and two staff are on duty, and she was the only pre-operative physician working that shift. Blair, a third-year resident, notices her new Dell, and says, "That must be new, Tina. Usually you and I are fighting over these staff room dinosaurs!" Tina laughs, setting her laptop down on a crowded table.

Tina checks the schedule on the wall for the five patients she will be seeing. She turns to her computer, waiting patiently for her wireless connection. She logs into CareWeb, and notices that her first patient, an elderly man having knee surgery, was not a record that she had seen on her CareWeb patient list. The patient is already waiting in the room. Tina glances at her watch. Three critical minutes until the physician's assistant is done with the patient. Tina clicks on the documents tab, spends twenty seconds reviewing each of the following notes: the most recent one, the last few orthopedic notes, a discharge summary from an inpatient hospital stay from one year ago. She scrolls down many screens of nurses' notes to get to the critical hospital admissions note. She decides to skip over it, knowing that the author, Dr. Kollman, had a penchant for writing particularly terse and unhelpful notes.

Tina has about thirty seconds left. The last EKG is a normal result after several abnormal results. Frustrated that she can't compare the EKG's side by side with the documents from the dates they were taken, Tina realizes she has run out of time, and resolves to ask the patients more questions to assess his risk for cardiac complications. Once she sees the patient, she will make a decision about his cardiac readiness, perhaps after requesting another EKG and ordering more tests, such as the heart catheterization or stress test.

Goals

- Optimize the time that a doctor has to spend reviewing a patient record by making it as fast as possible
- Make the documents that provide crucial information about a patient's readiness for an operation easy enough to locate
- Have a computer to be able to check CareWeb and dictate notes

3. Conclusion

The practice of developing personas and scenarios to define the target audience enabled our group to understand that wide range of CareWeb users and their goals. Some goals cut across specialties, such as the need to view documents from certain timeframes and departments, while others varied based on the users' role, such as the physician's need to sign his or her own notes appearing in their inbox. Some functions that we detailed in our Generalized Transition Network (ie., Manage Proxies) were not actually used by staff we interviewed, whereas others that we decided to skip for the sake of brevity (ie., Patient Lists) were on the staff's list of features used most often. We gained a holistic understanding of what was possible with the GTN, but now we had anecdotal evidence for what CareWeb users need for their daily routines.

Appendix A. Interview Notes

Interview Protocol

We followed a semi-structured interview protocol for our inquiry. This protocol is reproduced below. During the interviews, though, we found it necessary to deviate substantially because each caregiver had a very different role and different needs from CareWeb.

Job Description

Would you tell us a little about your typical workday?

Background/Computer Use

How comfortable are you with computers in general?

How many hours do you typically use a computer for work/personal use?

Tell me about the programs you are familiar with.

CareWeb & Tasks

How long have you been using CareWeb?

How do you use CareWeb in a typical workday? (scenarios of usage?)

How often do you login in a day?

Which functions do you use most?

Do you use CareWeb mostly at work? How often do you access it off-site?

Generally speaking, what do you like about it?

Generally speaking, what do you dislike about it?

Which aspects/features do you like and/or use the least?

Which features do you find to be easy to use?

A.1. MD, Internal Medicine

Interview date: February 1, 2007

- Physicians, nurses and admins use CareWeb
- CareWeb is used in three distinct situations: Admittance, treatment period, discharge
 - Admittance: Through clinic, ER or transfer from other healthcare facility.
 - If a transfer patient, patient is asked name and birth date, and is given a CPI (identification #). Sometimes people get two different CPI's by mistake because they may have middle initials; may receive a CPI for (first name + middle initial) or (first name + middle name) etc.
- Patient records are permanent
- There are also standalone databases, e.g. OTIS in nephrology.
- CDR—central data repository. Not all queries are allowed. For example, you can't ask for "all patients who have had "x"," because of ethical reasons.
- Centricity- contains data recorded during surgery
- Documents from outside sources are always kept on paper, either with the patient or in storage. "Imaged documents" feature in CareWeb will be of use (scanned outside documents)
- Ordering medicine for patients doesn't happen through CareWeb.
- "(In CareWeb) I look at the lab results. What the plan is for the patients."
- CareWeb works with Internet Explorer, but not other browsers. There are some navigation issues. Too many steps to go from one patient information to another.
- Vital signs and medicines- some are entered into CareWeb by doctors. Nurses first make a note of these on paper. Doctors look at these records on paper, if they think some parts are important they put that information in, or a summary. There is no flagging system for important notes.
- Occasionally there are login problems in CareWeb. It is normally a single step to login to the computer & CareWeb, but sometimes this doesn't work.
- "Context sharing business is sometimes tricky. For example, if I want to compare one patient's info with another patient's, I need to open them in separate windows, look at one of them in one window and the other in another window, but when you try to switch back, sometimes the system will get confused and show one patient's name with the other's data.

- Problem Summary- shows current problems, not a historical overview. This can be frustrating because it always reflects the last caregiver's preferences for how much detail to include.
- A document travels in this path: Create Doc ---- Notifications ---- Edit/Sign ---- Medical Docs
- In Edit/Sign, the author can be a resident doctor but the signer is always the attending physician. Only one person signs (at the VA there is co-signing)

A.2. MD, Kidney Transplant Consultant

Interview date: February 6, 2007

- Uses CareWeb for clinics and in-patient stuff, to locate patients, look at labs from a particular day, keep track of patients and their lab results, transplant evaluations (all in Notes). Radiology and cardiology information.
- Populates new patient lists.
- Spends ½ to 1 hr. on CareWeb on a typical day.
- “Correcting dictations take the most time, ~10 min per dictation.”
 - “Word processing in CareWeb is not very good, no MS Word-like capabilities. No way to set-up realistic templates.”
 - “Initially Fellows used to write notes. Writing notes takes a long time. Labor-intensive. The notes used to appear in the system around 8pm-12am (could take up to 12 hrs after patients were seen). Not good, therefore they started dictating notes instead. It takes about 2-3 times more to edit the notes than to dictate them. So, Fellows and residents started calling each other on the phone a lot to give recommendations/directions, which of course takes even more time.”
 - “People have time to put in the information but not for making templates. One doctor writes everything in FileMaker and then cuts and pastes into CareWeb. Lack of word processing functions is a problem.”
- “You can’t see more than one window at a time. Therefore, if you’re typing a note you can’t see the lab results or notes from other providers. Need to open up CareWeb in multiple browser windows. People are now both writing the notes and transcribing them into CareWeb.”
- “Computer literacy varies. Interface needs to be as straightforward as possible. There may be a steep learning curve to use CareWeb, but people know how to use it basically. No time to set things up (customize). No training for CareWeb.”
- Positive side: “CareWeb pulled systems together, therefore made things much easier. It was ok until they decided to make electronic notes. The “notes” component is not efficient. I use only some of the functions.”
- “Personalizing screen by setting defaults wastes a lot of time.”
- “Loading time of login is too long”
- “There are more providers than computers. A lot of time is spent signing people in and out. Some people bring their own laptops. There are a bunch of computers in patient rooms. In the future they want to have one in each patient’s room. I don’t know if this will be useful because it takes more time to take a note *and* talk to a patient at the same time.”

- Current procedure: Get paper record of patient from bedside, and sign in to CareWeb to add notes after the visit
 - Problem : sign-in before visit and sign-in again after visit → 2 sign-ins per patient]
- OTIS--- transplant system, more relevant and has documents from outside hospitals. They print out things from OTIS (blood tests etc).
- “No detailed data charts, visualizations (e.g. cholesterol profile superimposed on standard cholesterol levels -things like that would help). No data flags, though some critical levels may be highlighted in red. Also, the system doesn’t alert the physician to the fact that 4 out of, say, 20 patients, have critical levels, it would help the physician to prioritize.”
- Names lists chronologically (e.g. Feb 3rd)
- There is a CareWeb Clinical Advisory Committee. (Usually older doctors who see fewer patients now, so they don’t really understand the problems)
- “MCIT doesn’t know why CareWeb is not useful. They don’t understand the workflow. Updates are slow.”
- “Patient profile comparisons are not available. It would be nice to get aggregate info and look at, for example, average blood counts of admitted patients etc.”
- Problem Summary--- “*Everything’s* there, which is a problem. What is the latest problem? What’s critical? – can’t get the info immediately. Overstates problems that people have because there are too many things. Not really reliable.”
- “The system is not vocabulary sensitive, e.g. with medical names. Doesn’t recognize similar/same drugs because names are put in differently. They’re dictated with different names. There’s also no differentiation of why a certain condition arose, e.g. anemia, what’s the cause? Is it secondary? Is it due to a specific problem?”
- “Notes are not indexed in a certain way, e.g. which team is it from? What is it about?”
- “One gets duplicate copies of lab results from different departments. Usually 2-3 per patient. So always stacks of paper are used everyday but only a few of them are useful.”
- No plots of lab results. Results only listed in tables.
- “No notifications if there is any unusual/critical lab result. Will be helpful if they add this.”
- “Document imaging is very important for nephrology because they get a lot of stuff from outside. They need it, it will be very useful. Ideally it would be nice to be able to sort things. Queries, sorting, customization would be nice. There’s information overload, how do you filter through things?”

- Security: “Anyone can see anything if they have a CareWeb account.”

A.3. Social Worker

Interview date: February 8, 2007

- *general computer literacy:*
“Pretty literate. Use a computer a lot but do not use a lot of programs. I use the same programs over and over again. Surfing a lot. Email a lot. So, pretty literate. Email with work a lot.”
- Started using a computer (loaned from DEC) in high school for two weeks.
- “I would be hard pressed to quantify the amount of time in a day. I use it [CareWeb] a lot, mostly for looking things up. Things about patients – records, labs, demographics, history, appointments.”
- “We type our notes in through “Create Documents,” ours are not dictated. I have probably somewhere between 20 and 40 notes that I have to write in a given week (typical work week 5 days). I usually do some of the notes from home which is awfully convenient.”
- *Here before CareWeb?*
“Mhm. It’s made a huge difference. It used to be impossible to find the chart, and it is impossible to do anything without the chart. It would be off at the test, it would be somewhere else. Now we can look it up from anywhere.”
- “As our work has gotten more outpatient, this has become more important. It is hard for a chart to follow an outpatient everywhere. It would go off to wherever and we would never see the chart (paper charts were routinely sent to somewhere off site). Getting the chart would be a real challenge. It’s not the same as with inpatients, where the chart would just sit on a rack in their unit.”
- *What do you really like [about CareWeb]?*
“It accesses everything you need. All the old notes, all the old labs, appointments... everything I need anyway. I know it will have what I need. I know where things are going to be. I can read it and decide what to do – I don’t have to go upstairs to see the chart. It’s where everybody charts. Well, not the nurses.”
- *Where do the nurses chart?*
“I think they chart on the flow sheet in the patient’s room.”
- *Is this just for in-patients?*
“Yeah. Nurses do not do a lot of charting for out patients, but if they do, it goes on CareWeb.”
- “Everything is there, and you can see the continuity, and put your stuff into the continuity. This is just fantastic... it’s really terrific.”
- “I use My Inbox and list a lot”

- *Do you always put your notes into continuity?*
Yes. Not for every minor contact, but yes.
- *Walk through [of what he does in a typical usage scenario]*
“I’ll have a patient name or registration code. I’ll do a patient search. (If I don’t know the patient’s name I run a caregivers search; I’ll know the caregiver. I go to patient’s records; click their name and it’s there. Read documents, visits, previous social work contacts, things like that.”
- *Time crunch is a big deal?*
“Absolutely.”
- “There is not really a place for me to type at the clinic, so I do not do it right after I get done seeing somebody. I wait until I go back to my office (Someone else may be using the computers in the staff room..) or at home – I’m doing it at the end of the day, or I am doing a couple last night until I fell asleep (laughs). I am always behind. That is a problem. I’m open to suggestions!”
- *Does this cause problems for you, when a record is not there?*
“Not really. I think the doctors just dictate them, so it shows up pretty quickly. Every once in a while, it’ll be an issue where the surgeon will not have dictated a note or the note will not be there.”
- *Things I do not like*
“It would be nice if there was a running history and physical, rather than each note having a new history.”
- *How about the problem summary list?*
“Yeah, but it is more problem focused than history focused. When I’m looking for something, it is usually history related. Patients also get tired of this. They don’t like giving the same history each time, and worry about missing something. They would rather just update what is in the computer... I have to go back and look through page after page of notes to find some of this. Centralized history would be nice, where people may add/edit. Here you go page after page, screen after screen to do that. But that’s my only real complaint. Otherwise, I think it’s been fantastic, really good.”
- *Have you seen other systems?*
“I’ve seen some for social work, but they don’t compare.”
- *Why?*
“They aren’t able to access anywhere near as many systems. I also did some work on TQ, a discharge planning system, but it was so much more cumbersome. It would synch only once a day with the CareWeb system. A lot happens in a day, so it would be out of date. I also like that I can get to it from home. It’s a couple of extra password steps, but I can deal with that [level 1 different password, level 2 another password (regular CareWeb password) when

accessing off-site]. The fact that I can get there from home is convenient. It's become a routine part of my job now."

- *How did you learn about CareWeb?*
"I can't remember how I first learned to access or use it, but to chart things myself, I went to a training session. Then I trained others in the department. I learned from med students, interns etc. That was called "Create Document" and that was terrific. But I really can't remember"
- *Has there ever been any big mistake?*
[laughs] "I make lots of mistakes when I am making notes. I'll select the wrong date or put the wrong type of document, but they have an email that lets you send a note to the transcription folks. They've been able to get it fixed, and nothing bad yet."
- *Check back and add the record*
"Sometimes I get incomplete medical records notices from Create Document, if document is over 1 week old."
- *[Do you] explore features?*
"I'm not sure that there are things that it does that I would need that I don't already use. I use lists, my lists a lot. In fact, that's how I keep track of patients. Notes -use caregiver search to find out who's coming tomorrow so that I can go and see them,- documents, lab results, other results, rad nuc, medications."
- *Within problem summary?*
"No, in-patient medications. Since that stays put, the last time they were discharged I know what they were on."
- *My Inbox?*
"Oh yeah. That's where my notes are to be read and signed."
- *Do you need things from outside?*
"Yes. I know how to use "imaged documents" within CareWeb, especially for things like power of attorney forms."
- *Notes are free form text?*
"Yes. But I've pretty much made my own template. There are maybe 20 or 30 spots where I have to type things in. "Patient is a ___ year old _____. Kidney failure because of _____." I keep it in Microsoft Word, so I make my note outside of CareWeb, and then copy and paste. That's where I've made some of my mistakes. Paste my last note rather than the one I've just finished."
- *Would you say that process is somewhat cumbersome and time consuming?*
"It's okay. Create document is not as smooth of a word processor as Microsoft Word, though they've been improving it." (no spell check, no auto-complete)

- *Are there ever problems with completeness of information?*
“Well, sometimes I can read between the lines and tell that they are charting for the chart but that something else has happened that isn’t in the cart. In that case, I’ll call up the caregiver and say “what happened?” and we’ll talk it through.”

 - *Do you think there are things that can help fix that?*
“Not really. There’s a richness of interaction that happens face to face. Like, we’re sitting here talking but if we were emailing back and forth, we would not get as much out of it. So it will never replace all of that.”

 - *Can you put a face to that name?*
“No, can’t put a face to a name since started using CareWeb. If they had a picture, that would help! (laughs). It’s especially true because transplant takes a picture when they evaluate them, but it sits in their folder rather than online.
- *Would like a copy of our final work for information on electronic charting, may be giving presentation to a group of social workers.***

A.4. Nurse #1

Interview date: February 8, 2007

- *Use in typical day?*
“Oh, I use CareWeb all day long. 90% of my day... 80 to 90, depending on how busy I am.”
- *Typical workday?*
“8 hrs.”
- *How long on the average patient?*
“No, there’s no average. Some patients take long and some people are really quick.. I could see 20-100... well not see them, but see their files.”
- *Which features?*
“Mostly we use labs, and the problem summary area for meds, and then dictation and documents and appointments. Mostly we use labs...”
- *How do you know which to look for?*
“If you’re looking for admission information, you go to admission information for discharge notes. If you’re looking for current, you look for notes. If you’re looking for nephrology (with nephrology I look at the last dictation and then go backwards), or radiology...”
- *How long?*
“I’ve been here for 12 years, so 12.”
- *Do you remember before?*
“I always used CareWeb.”
- *Besides CareWeb, you use any other notetaking?*
“Well, we used to, but we’re trying to go paperless. So now I use CareWeb and OTIS. The first thing I do when I get in in the morning is to fire up my computer and open CareWeb, OTIS, and Groupwise (for communication with docs etc).”
- *Orient yourself?*
“No, it’s all the same.”
- “Some things we handwrite... like, if a patient calls in with an issue, the clerks they write it down for us.”
- *Can admins access CareWeb scheduling?*
“No, they use another system called EWS. No, I don’t think they can schedule or scan documents.”
- *Do you use a computer much outside?*
“Some, for email.”

- *Notes?*
 - “When we’re seeing patients in clinic, we do the paperwork [on Careweb] afterwards. If a patient calls – and most of our work is by phone -- we can enter it right into CareWeb. But a clinic appointment, we’ll save it up. We don’t use CareWeb for every clinic appointment unless something would happen with a patient, because the doctor would dictate a note for CareWeb. Most of what we do, we use OTIS.”
 - “Doctors put their notes into CareWeb, but they do not use OTIS. If we put all that stuff into CareWeb, it gets bogged down with all kinds of crap that they don’t want in CareWeb.”
- *What kinds of things would you put in OTIS that a doctor wouldn’t?*
 “What the complaint is.. What’s been done.. Most activities go into OTIS, for me, instead of CareWeb.”
- *System in mind for deciding what to enter information into CareWeb vs. OTIS?*
 - “If you want it to be a part of... let me back up a moment. They want us to start entering everything into CareWeb because everyone has access to CareWeb while it’s just the people in transplant that have access to OTIS.”
 - “If I had a patient that was non compliant, I would put it in CareWeb so everybody – not just transplant – knows that he’s really noncompliant. I’d have to put it in OTIS too so that all of the transplant nurses will see it too.”
- *So that’s duplicate?*
 “Yup.”
- *Feature you do not like?*
 “More care... it’s not called More Care anymore. It’s down on the bottom. You can look up surgery dates. It’s there, but it’s not really clear how to find things or what you would find there (sometimes it will show an appointment but, for what? With whom?). Sometimes you cannot find an inpatient appointment in CareWeb – like surgical information – but you can find it down there.”

---ED.OR/TB (CENTRICITY)

“Overall, though, I like it [CareWeb].”

- *Doctors use?*
 “Doctors use primarily CareWeb... I mean, they could go to OTIS, but let me put it this way. If a doctor wants something in CareWeb, he’ll tell me to put it into CareWeb. There’s one doctor I work with who tells me to put certain info into CareWeb and not just OTIS”

- *To find info?*
“Could go to either/or because CareWeb dumps into OTIS.”
- *Dumps into OTIS?*
“We get x’s... it’s a trigger that takes us to CareWeb if the document is not there. If OTIS triggers that there is something in CareWeb, I will go back into CareWeb to get to it because OTIS will just take you to the documents and can’t get to other CareWeb features.”

A.5. Nurse #2

Interview date: February 9, 2007

- *Computer literacy?*
“Overall? Well, I’m not a wiz. I’m very comfortable with CareWeb, but... you know. I can use my own stuff, but I’m not great. I recently bought up a laptop and needed to set it up at my home. I had to call the online guy, and he seemed irritated with what I didn’t know.”
- *But with CareWeb, it is different?*
“Oh yeah, because I use it so much.”
- *Use in typical day?*
“I use it all the time. Because I’m in transplant, I use it along with OTIS. But I’m on it all the time. Now, when I’m in the clinic, I’m not at it, but I’m constantly referring the data for each patient.”
- *Clinic - In between patients?*
“Yeah. I’m always looking at it. I’m working all day long, all the time. Reviewing labs, patient requests for test results (patient labs, records, doctor’s notes). It’s all in OTIS or CareWeb. It’s basically all I’m doing, all day long.”
- *How do OTIS and CareWeb connect?*
“If we do labs in the hospital, then we’ll dump the necessary results from CareWeb into OTIS, but if they talk they are not fully connected. The plan is for them to eventually connect, but it’s not there now.”
- *What do you like about CareWeb?*
“It has all of the information that I need, but nowadays, I do use OTIS more. It’s fairly fast, fairly easy to get around. Can I tell you some of the things I do not like?”
- *Absolutely.*
“Well, some of the stuff like patient demographics I do not think is very accurate. Patients’ phone numbers, addresses not always accurate, and it’s a problem because we always need to reach patients. Things aren’t updated. You’ll end up calling numbers that are disconnected or inaccurate or something. With OTIS it is more accurate, because someone is always entering data to make sure we have the right contact information. If there’s a discrepancy, I prefer OTIS.”

“I like that it has the documents, notes, radiology reports, labs. I wish it was a bit faster to pull some of these up, like radiology reports. I wish that it came up immediately. With clinic, we have patients that come in that need an ultrasound (*note*: ultrasound of the transplanted kidney, so they can see if the patient can be sent home). We used to send them down to radiology, and the radiologist would handwrite a report that the patient would bring back up to us and we could look at it. Then people started telling us that they

didn't do that anymore, since things are on CareWeb "immediately." But they were not immediate, which was a problem because we needed to see the lab results in order to say whether or not the patient could go home. I've noticed that it has gotten better, but it's still not perfect."

"All the nurses' notes are supposed to be on CareWeb now. We're sort of transitioning, and that's been working, with getting notes up on CareWeb pretty quickly."

"I think it's a pretty good system, but I do have a complaint about the accuracy of patient demographics."

- *Walk through?*

"That's why I'm always on the computer. I'm looking up labs or doctors' notes. I know what I'm looking for – I'm usually looking for previous kidney transplant visit notes or a discharge note, and I know what those look like in the list – so I know what to do. I like that it has a long list of notes."

"I notice – well, this may show my inability to access notes – but if you're looking at a screen but it shows only some of the recent notes. How do you get back to the older, previous records if there are lots?"

[explanation of date range]

"Oh, then that's a thing. There should be an easier way to do that."

- *Where do you use computer?*

"Nurses' station, laptops you can take into the patients' room. I think the staff room has gotten better, and I know they are aiming to get a laptop in each of the patients' rooms. I never bring a laptop into patients' rooms – but some people do. I think some of them aim to type the note while they are in there, but that's too time consuming. Doctors want to get in there as quickly as possible, they want us to do our thing so that they can come in and look at the patients themselves. No time."

- *Do you enter any information into CareWeb?*

"Not into CareWeb, sometimes enter stuff into OTIS. But I do correct mistakes if I see there are any."

- *Life before CareWeb?*

"I do remember – I worked in the lab – I had PathNet. We had a little... it was a lot slower, a lot more cumbersome, a lot more screen changes."

- *Learning?*

"I don't remember, but I don't think it was hard. That was a good thing about it. I think it's pretty easy, it's not too hard to get from place to place and there aren't a lot of screen changes, while PathNet you had to put in 10-zillion things to change patient screens."

“This has been happening recently- when you go to Lab Results the most recent one doesn’t come up immediately. Other nurses have commented on this as well. There was a CareWeb update, it shows older results, and there would be a little box saying to look at newer results. I have to remember to check the box to see if there are newer labs -because we want to see the most recent kidney function,- but sometimes I miss that and I’m giving the doctor the wrong information from out of date results. That’s one of the reasons I like OTIS more – it lays out all the labs as a nice spreadsheet, so I don’t have that problem. It also has more up to date information (like the demographics are more accurate), and so it is just better to use.”

“We have someone who has designed OTIS for us, and he is always asking us questions to make it better. I think one of the surgeons from the area is very involved with it, and then we have our own project with Jim Dean that has helped make it what we need.”

“Dr. Marian is recently in OTIS”

A.6. Newly Registered Nurse (physical rehabilitation unit)
Interview date: February 9, 2007

- 3 weeks working with CareWeb. Some experience with such a system during days in school, but that system was not as advanced as CareWeb.
- She received a 2 hour session in class where CareWeb was discussed. For the most part she is learning CareWeb on the job. E.g., someone walked her through using the ‘create document’ feature to create a document.
- She finds CareWeb “easy” to use.
- Outpatients in rehab have stays ranging from 1-3 months.
- Patients in the rehab section come from various departments
- She believes using CareWeb is “so far so good”
- She has little time to keep checking CareWeb since she does a lot of physicals.
- She (and other RNs) uses email a lot for administrative purposes: schedule changes etc.
- She mostly uses CareWeb when she sees a new patient and needs to check up on their history (e.g. med history, lab results etc). She primarily uses the patient’s careplan (we don’t know yet who prepares this) which is on paper.
- “CareWeb is more of a reference”

A.7. MD, Pre-operative Clinic (from SI649 - Fall, 2006)

Interview date: October 24, 2006

- Actual workflow:
 - About 20 seconds per note.
 - Health Maintenance Exam a useful note – has all acute and longstanding conditions
 - Also visited other results – EKG
- Medical assistant did not print out the old one as dr. expected
- Note like “Adrenal mass likely an indentaloma” more of a useful summary note than usual. Depends on the person writing the notes.
- First woman a sweet old lady crying in pain, needing a total hip arthroplasty.
- Pre-op doctors wants to see details of last hip replacement, internal medicine notes
- Doctor mentions that incorrect information in notes perpetuates
- Doctor sometimes uses two computers, one to input and the other to view comparison – good reason for usage of multiple views.
- Doctor ___ had to ask Doctor ___ how to input and print off a new medication. Three clicks to print off one prescription after it is entered.
- CPOE being used in labor and delivery, next up is children
- Doctor on why skipping notes often happens: “I know these people and it’s no help to click on their notes” Huge variability.
- Doctor ___ asked Doctor ___ what a UNI was. He didn’t know. Found the definition in another note by manual trial and error (uni-compartmental knee arthroplasty)
- Notes with most jargon are ophthalmology
- Doctor took between 5 and 10 minutes to review this patient’s notes, including time to talk through her choices with us.
- Preop visit purpose: helpful things that can be done to reduce risk of a heart attack or cardio event coronary disease, should fixed first often. May request a heart catheterization or stress test.

- Follow-up worksheet for Medical Assistant
- Doctor requested beta blockers increase on this paper form.
- Could request stress tests, home call alert, etc.
- “Other” is barely used in preop.
- Echo time = days to weeks after a test is done that the results are reflected in CareWeb
- 5 patients for the doctor in 4 hours
- 3rd patient had knee pain and was getting surgery for it.
- Doctor looked at EO – orthopedic note, which was very long and detailed
- The environment in the staff room was loud and busy. Sibling order conversation distracted Doctor briefly.
- Self reported time budgeting: 4 hour clinic day requires 1 hour reviewing notes chart in room, 1 hour reading tests.
- FT Clinicians get the 4 hours to see patients and a half day to catch up.
- For inpatient doctors, “catch up” time is not accounted for.
- 1 appointment for a hospitalist = 6 months in the ward, 2 months outpatient consult, 50 half-day clinics.