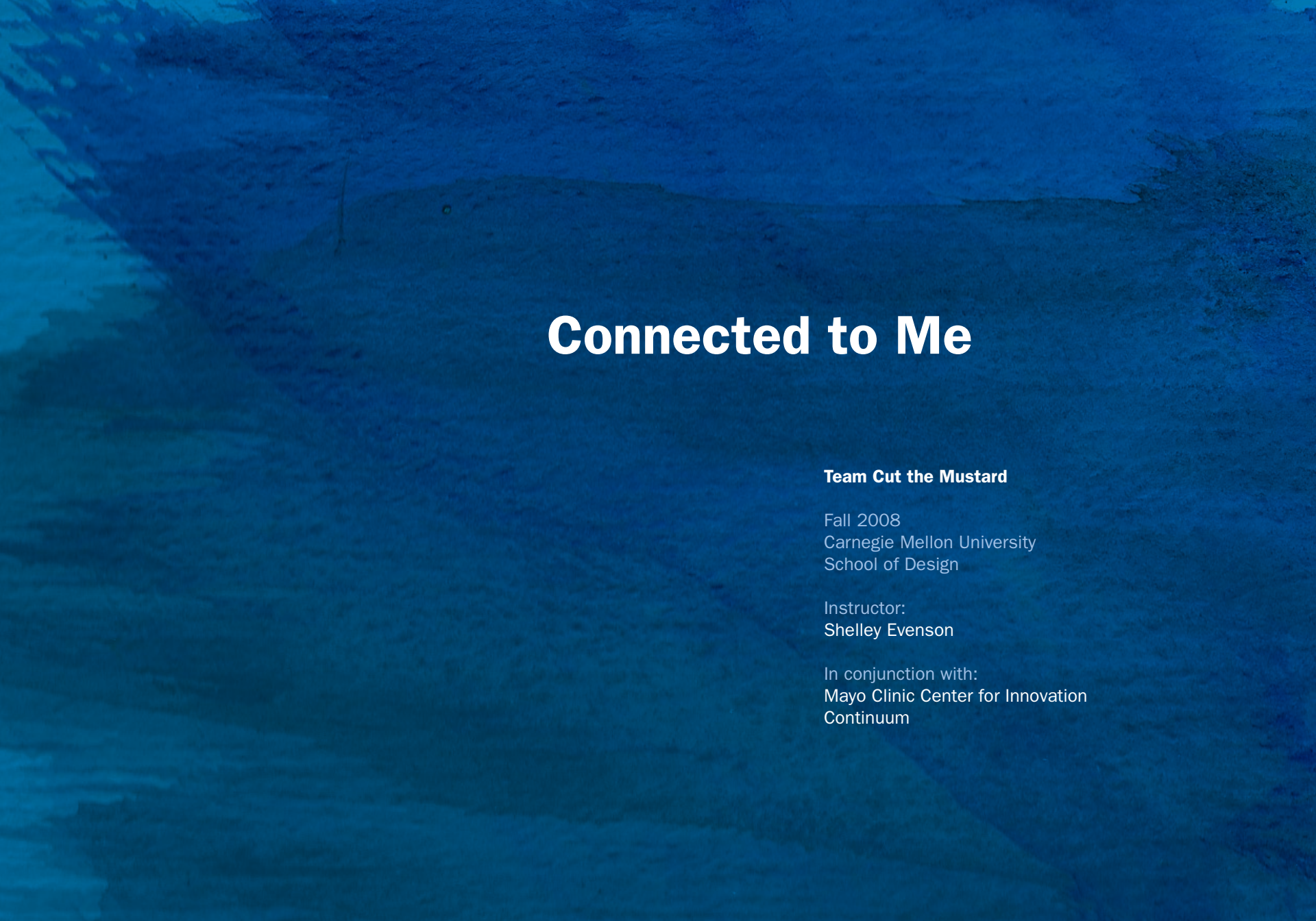


# Connected to Me

**Team Cut the Mustard**

Fall 2008
Carnegie Mellon University
School of Design

Instructor:
Shelley Evenson

In conjunction with:
Mayo Clinic Center for Innovation
Continuum

# Our Team

**Tim Cheung**
Product Development

**Ali Garrity**
Product Development

**Richard Ram**
Human-computer Interaction

**Kyle Vice**
Interaction Design

**Ruqian Zhou**
Product Development

# Research, Findings, & Implications

# The Challenge

**What could the Advanced Medical Home be?**

We were tasked by the Mayo Clinic to explore what the future of coordinated care might be, beginning from the notion of the Advanced Medical Home.

We began by reviewing existing literature about the Advanced Medical Home. Much of this literature framed the concept as a vision of care coordination. Early discussions with Mayo Clinic physicians and finance experts highlighted that this challenge was actually much greater than simply coordinating care. In this early phase it also became apparent that physician compensation is governed by specific activities which do not necessarily reflect the spectrum of care that physicians provide to their patients.

In order to provide a different type of care the entire culture of the health care profession will have to change. We explored what is encompassed in the health care ecosystem based on existing literature, our own experiences, and our conversation with Mayo Clinic employees.

Our territory map reflects the aspects of the Advanced Medical Home that we wanted to focus on addressing.

Throughout the project we would return to this map and ask ourselves:

---

Would this help provide trusted, integrated, and affordable patient-centered care?

---


**Territory Map**

# Who needs AMH?

**Patients in the revolving door.**

Early in our process we looked to narrow the scope that we were examing in an effort to bring the AMH down to a level where we could explore the details of patient experience to gain greater understanding. Based on our initial research, we decided to focus on chronic care due to the amount of care that patients with chronic illness are likely to need.

Chronic care patients have illnesses which will be with them for their entire lives. However, many illnesses fall under the umbrella of chronic care. In order to narow further we chose an illness which has been growing rapidly and placing an increasing burden on the healthcare system: diabetes.


# What is it like to live with diabetes?

**Understanding patient experience.**

Having narrowed down to diabetes, our task became understanding the current experience of living with diabetes. We constructed journals and maps for patients to complete in their daily setting. We also designed interview protocols for patients and physicians within the Mayo Clinic setting.

Alongside our primary research we also reviewed existing literature and products for diabetics. Members of our team also engaged in an empathy-building exercise by tracking daily food intake and wearing an insulin pump.

**Daily Life Journal**

# What do they need?

**Care beyond the clinic.**

Our research pointed to some clear breakdowns in the experience of patients with diabetes. Their clinic experience seemed to be very positive, but this experience did not match their daily life with diabetes. Interviews with both patients and physicians confirmed that the real challenge in living with diabetes was behavioral and lifestyle changes.

We identified several key factors involved in helping patients adjust to living with diabetes. We came to identify three major places which could better support patients who are *adjusting to their new normal of living with diabetes*.

**Support in everyday decisions.**

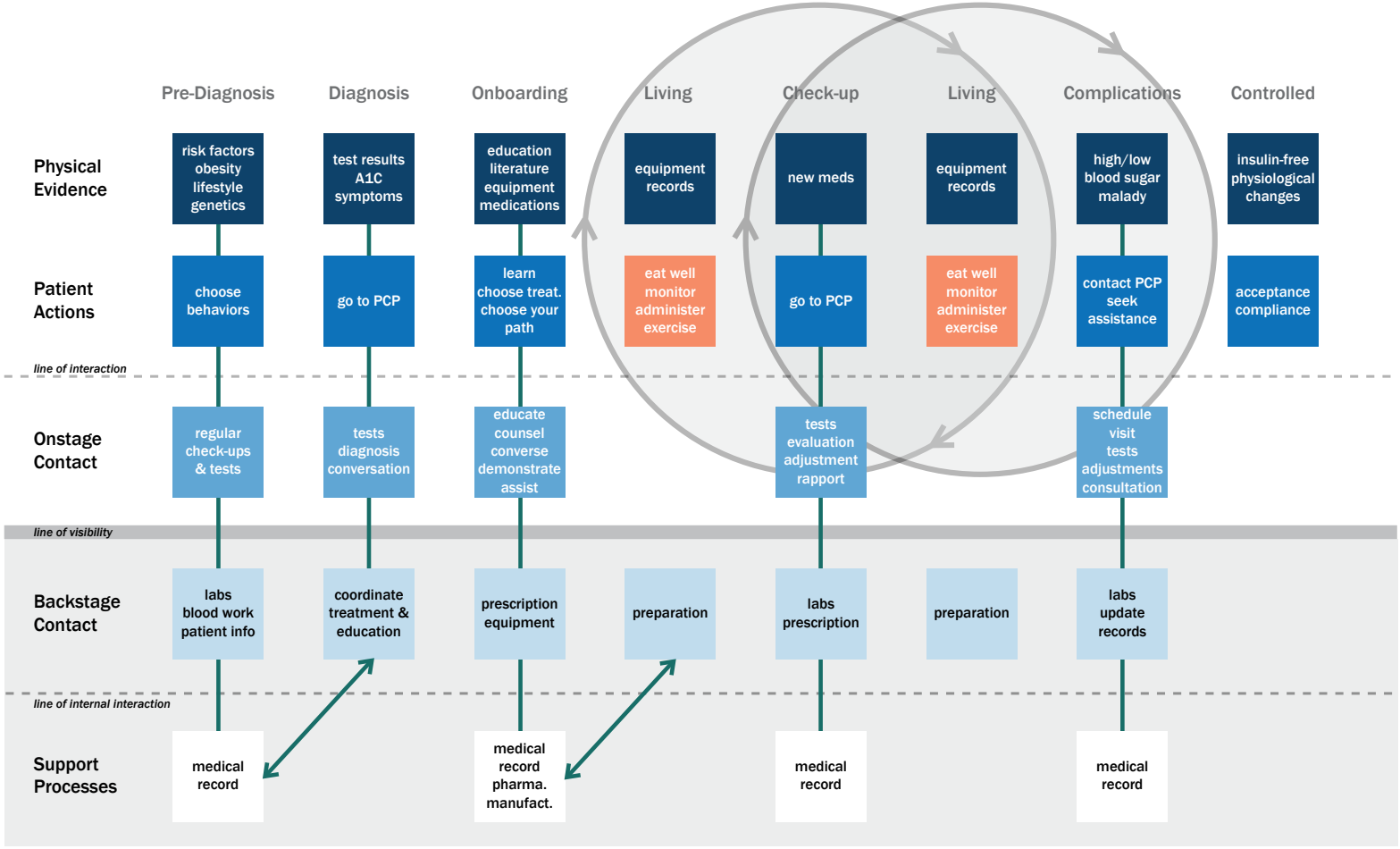
**Education that supports their actions.**

**Motivation to take ownership of their condition.**

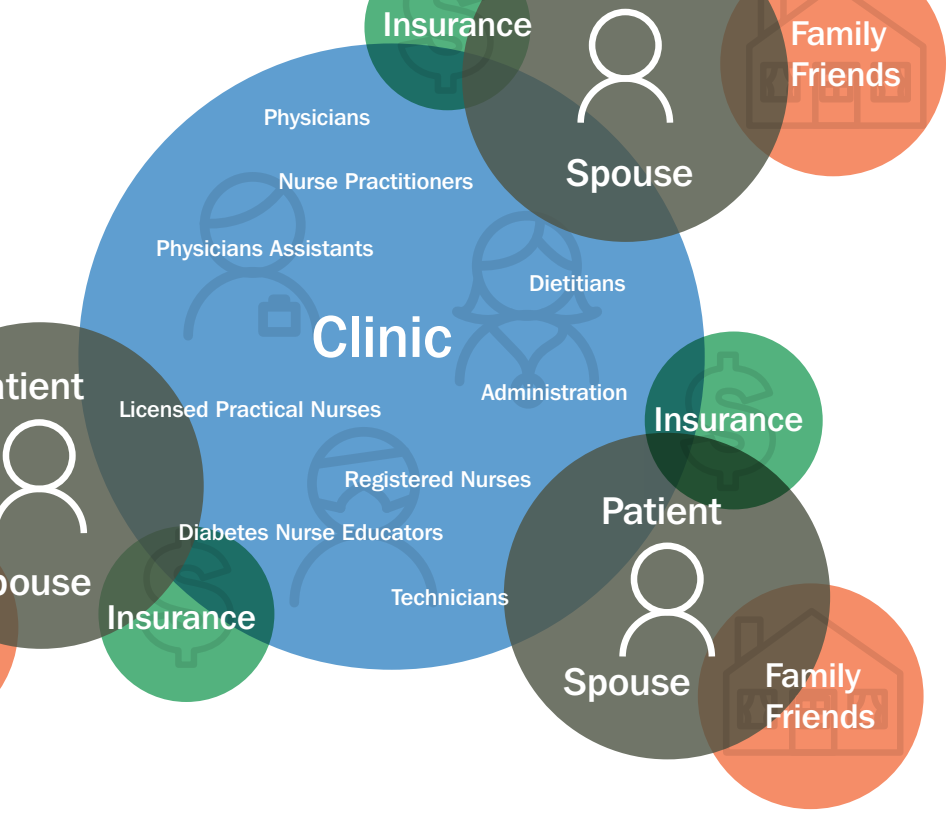
Patients need to be supported, educated, and motivated to make the right decisions, but not just at the clinic. Living with diabetes is a daily struggle, and it is the decisions made by the patient everyday that impact their condition.

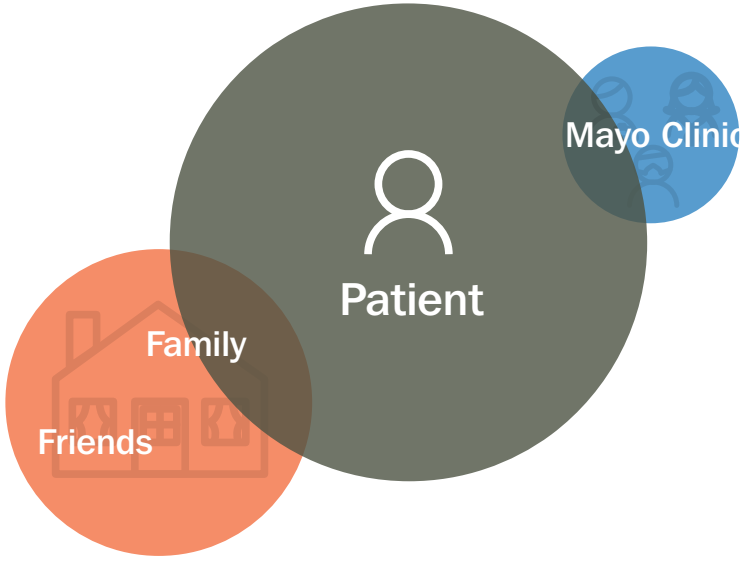
> "The patient is the only person with the patient all the time."

**Dr. Victor Montori**




**Service Blueprint**



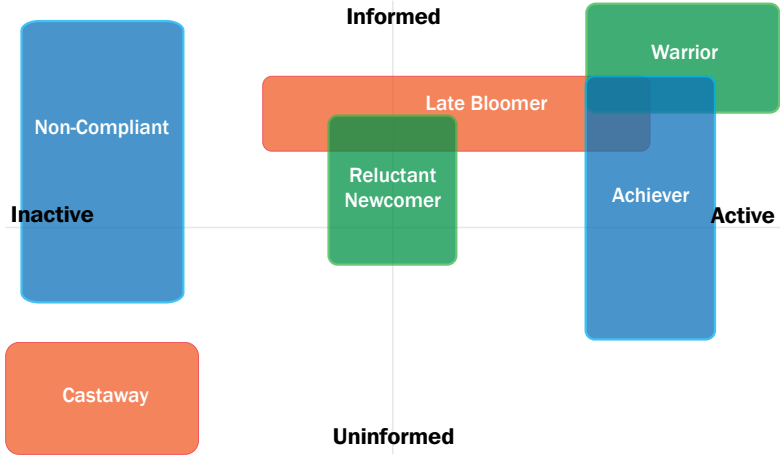

Moving from clinic as focus to care meeting the patient where they are.

# What do they need?

**Individualized care.**

Our research also pointed to something else beyond daily support: the differences between patients mean that the same care does not work for everyone. In order to effectively reach patients, care must be tailored to individual needs, behaviors and goals.

We identified at least six different personality types across the patients who we spoke to. These types are differentiated by how they respond to the new normal.




**The Warrior**
Fights and makes major changes immediately.

**The Achiever**
Self-motivated and always follows the rules.

**The Late Bloomer**
Makes changes based on fear of illness-related complications. Struggles to find balance in decisions.

**The Reluctant Newcomer**
In denial and won't make any changes until she has been diagnosed with a full-blown condition.

**The Non-Compliant**
Recognizes the presence of a problem, but refuses to do anything about the problem.

**The Castaway**
Completely lost and in need of help.

# Ideation, Iterations, & Final System

# Roles

**Establishing the necessary parts of a system.**

Moving into the concept phase, we identified the roles necessary to meet the needs we had identified. We had to decide how we could support, educate, and motivate patients in their daily lives.

---

**Mentor**
The mentor provides guidance and helps educate patients about their new normal.

---

**Support Group**
The support group provides support for patients in their daily decisions.

---

**Communication Channel**
The communication channel is a way to keep patients in contact with the other roles in order to answer their questions and provide education and support.

---

**Coordinator**
The coordinator helps customize the patients' care plan and ties the mentor and support group roles together.


Wall
Info
Update Status
What are you
Photos of Me (405)
Videos of Me (7)
My Friends (698)
See All
Mark Slee
Ruchi Sanghvi
Aditya Agarwal
Matt Cohler
Give a Gift
Today
Yesterday

# 1 People

**Our first concept: Filling the roles with people.**

Moving into the concept phase, we identified the roles necessary to meet the needs we had identified. We had to decide how we could support, educate, and motivate patients in their daily lives.

---

**Experienced Patient Volunteer as Mentor**
By interacting with patients who have successfully adjusted to their new normal, new and existing patients benefit from the knowledge of someone who has been there.

---

**Mentor/Patient Pairs as Support Group**
The pairs learn from each other and share stories about daily struggles together.

---

**Website as Communication Channel**
A website serves as both an educational resource and a connection to the Mayo clinic for support group members.

---

**Mayo Employee as Coordinator**
The coordinator, a Mayo employee, focuses on matching patients to mentors and overseeing support groups.

**Feedback**

“Nothing here is new.” Everything suggested is already being done by someone.

---

## Who else can do this work?

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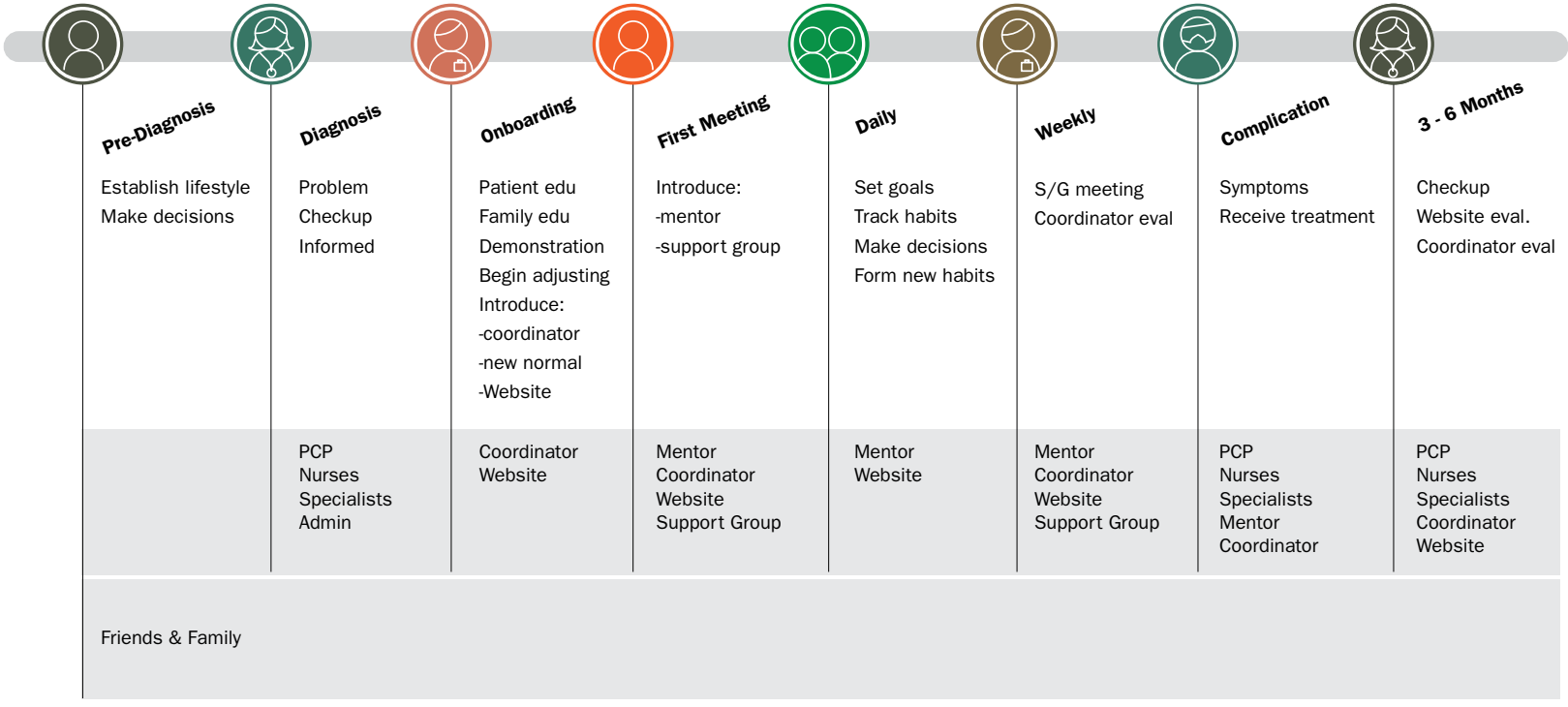


**Journey Map: Concept 1**

# 2 Virtual / Distributed

**Our second concept: Technology as a channel.**

Bearing the feedback from our first concept in mind, we rethought how we could fulfill the necessary roles.

---

**Friends and Family as Mentor**
Through a Virtual / Distributed Mentor system, friends and family provide guidance and encouragement.

---

**Fellow Patients as Support Group**
Fellow patients form the support group, help answer questions and share stories about adjusting.

---

**Device and Website as Communication Channels**
A device is now an additional communication channel between patients, family, and friends. The website remains as a way of communicating with the Mayo Clinic.

---

**Mayo Employee as Coordinator**
The coordinator now acts as a filter, selecting pertinent information from a patient's daily life log and adding it to the EMR for the primary care team.

**Feedback**

Interesting — but keep pushing on where the load is being placed. We were encouraged to look at games and mechanical Turk systems to keep finding new ways of distributing the work.

---

## How else can this work be done?

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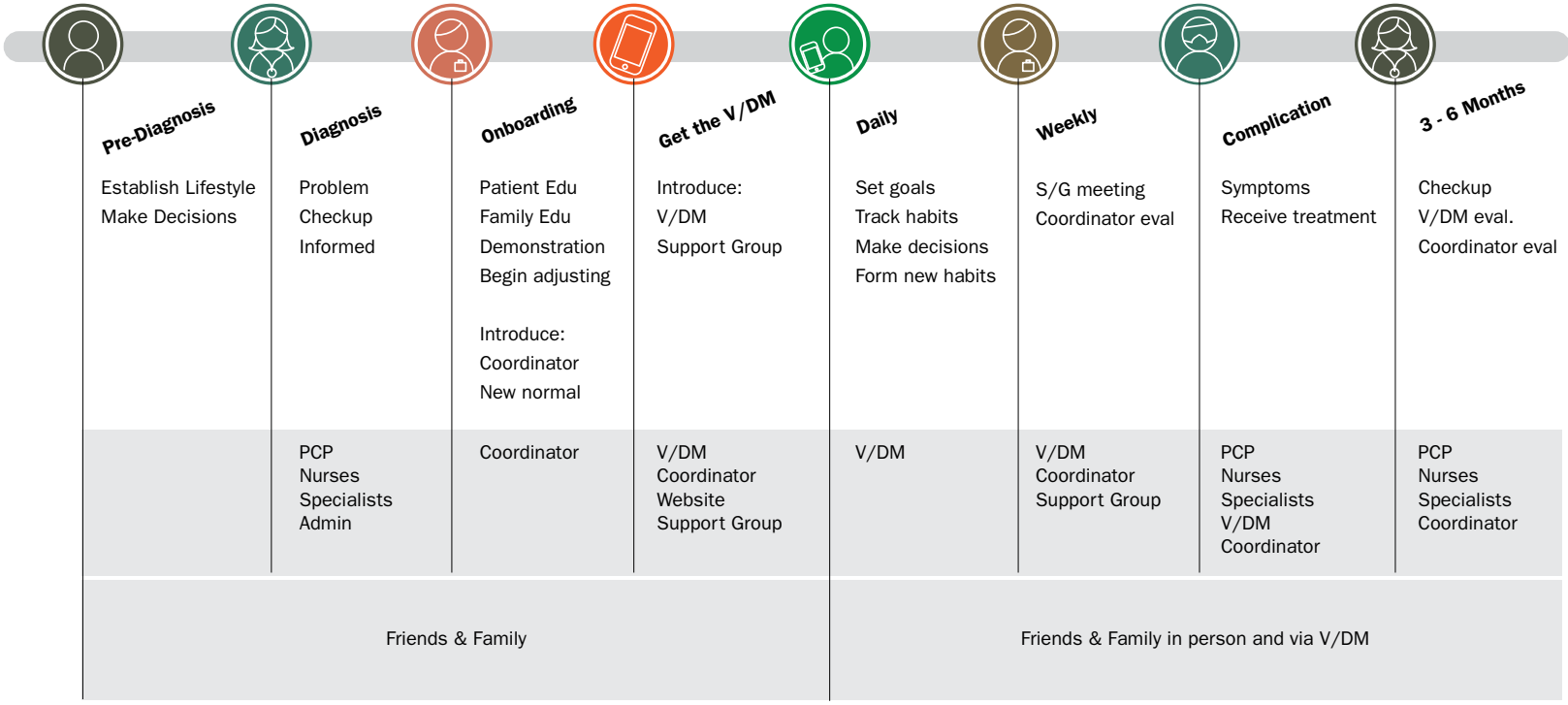



**Journey Map: Concept 2**

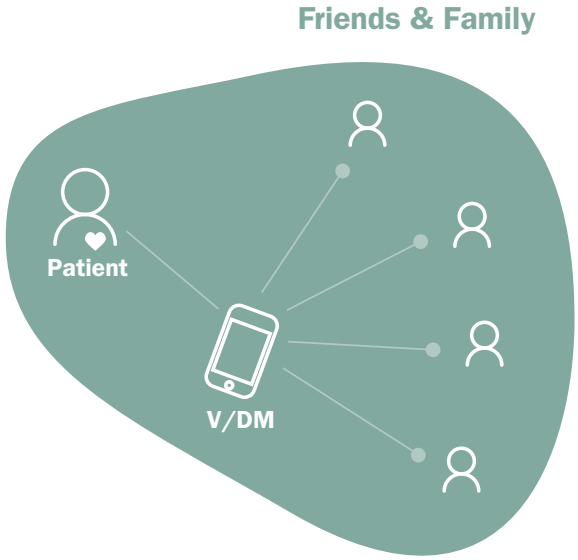
# 2 Virtual / Distributed

**A detail of our second concept: Distributing the workload.**

Looking at the successful Obama campaign, we wondered how we could distribute the work of care amongst a larger number of caregivers. Instead of increasing the workload borne by the primary care team, we aimed to distribute the workload across those who already care for the patient.

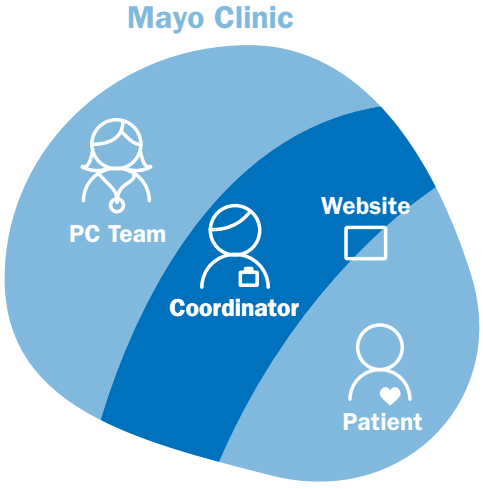
By engaging people who know the patient best, their family and friends, daily support can be distributed across a greater number of people.

Randomly selected friends and family are contacted by the Virtual / Distributed Mentor system and informed when the patient sets a short-term goal. They are asked to contact the patient and encourage completion of the goal.




**Virtual / Distributed Mentor**
Asking lots of people to help a little, everyday.

Barack Obama's
Presidential Campaign

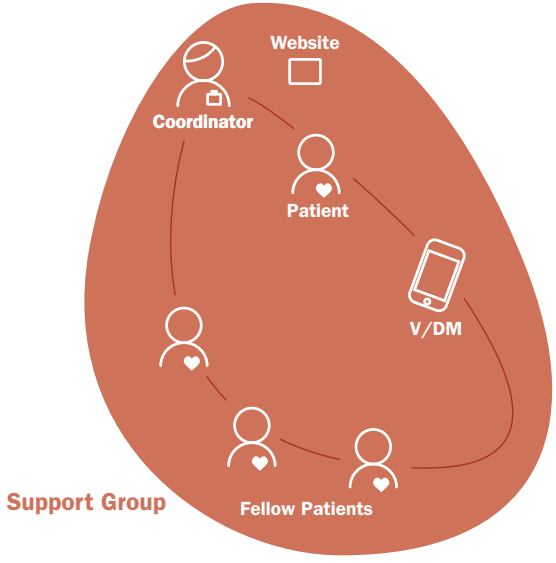



**Website**
Connecting daily goals to improved outcomes for the patient.

StepGreen.org

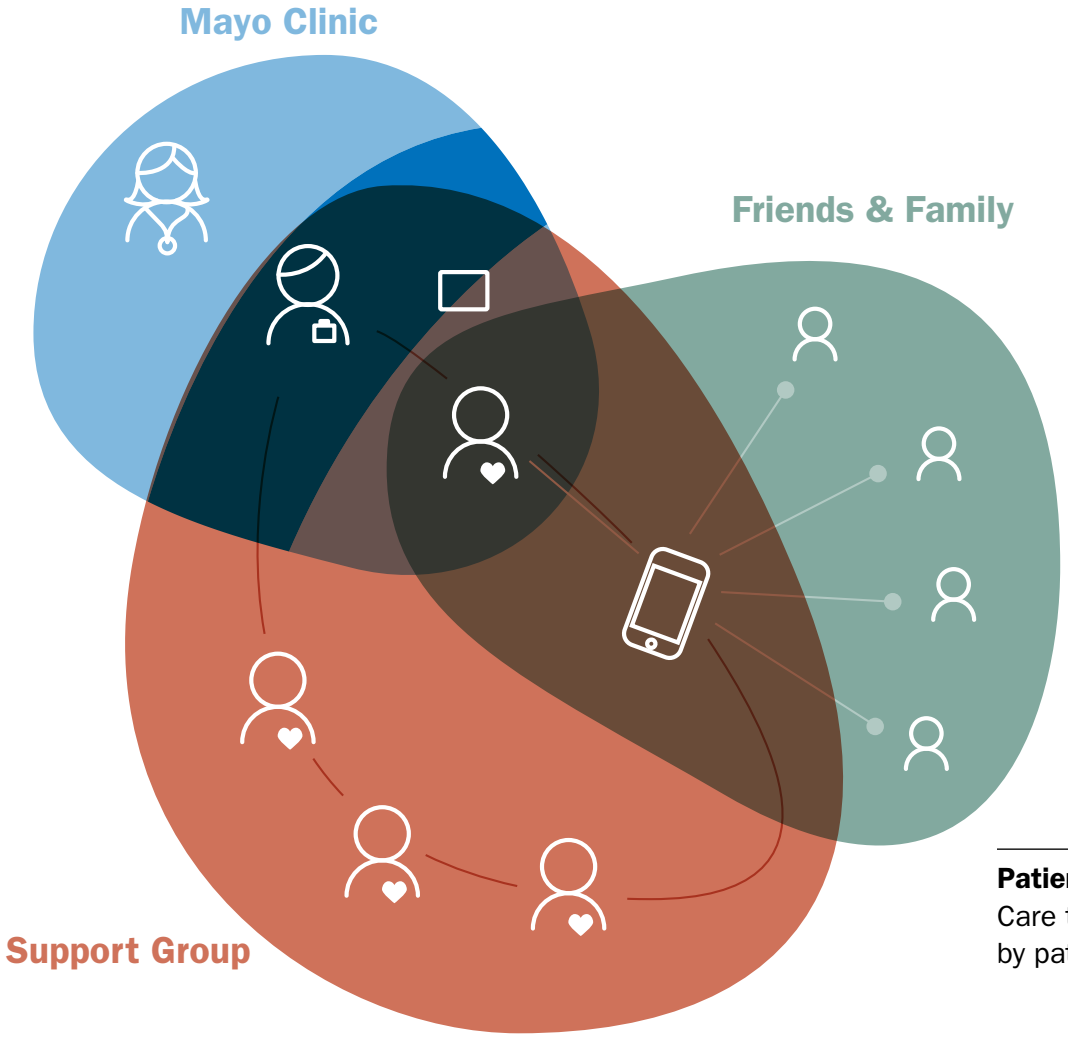
**Coordinator**
Providing a constant point of contact at Mayo. Also, an information filter between the patient and primary care.

Tech Support




**Support Groups**
Sharing stories and working through issues together.

Churches, AA, and Greek Orgs.

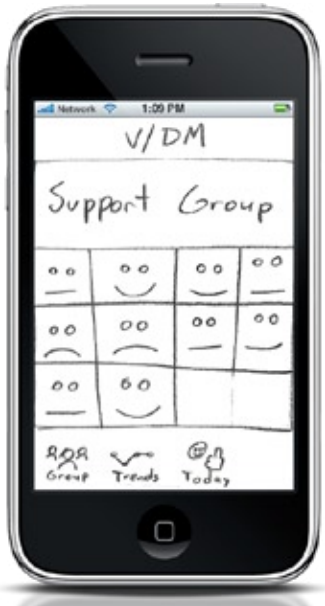



**Patient-Centered**
Care that is guided by Mayo, but supported by patients and families on a daily basis.


**Goal Setting**
A patient chooses their goal for the next day.


**Self-Assessment**
The patient rates how they performed on their goal.


**Seeing Choices**
Patients see how the choices they have made have impacted their health.




**Support Group Status**
Patients can see how other patients in their group are doing with their goals.

# 3 Connected to Me

**Our final concept: Care from an entirely different source.**

Our final concept is inspired by pushing further into the roles and considering not only who, but what, could do the work. We continued exploring the roles that a device could fulfill in caring for the patient.

---

**Device as Mentor**
A device provides the patient with personalized advice about which choices and behaviors are best. It autonomously informs, supports and encourages patient behavior.

---

**Device as Communication Channel**
Using the device, a support group of patients is connected by twitter-like status updates.

---

**Fellow Patients as Support Group**
The same twitter-like connection allows patients to provide point-of-need support and establishes a forum for patients to ask questions of each other.

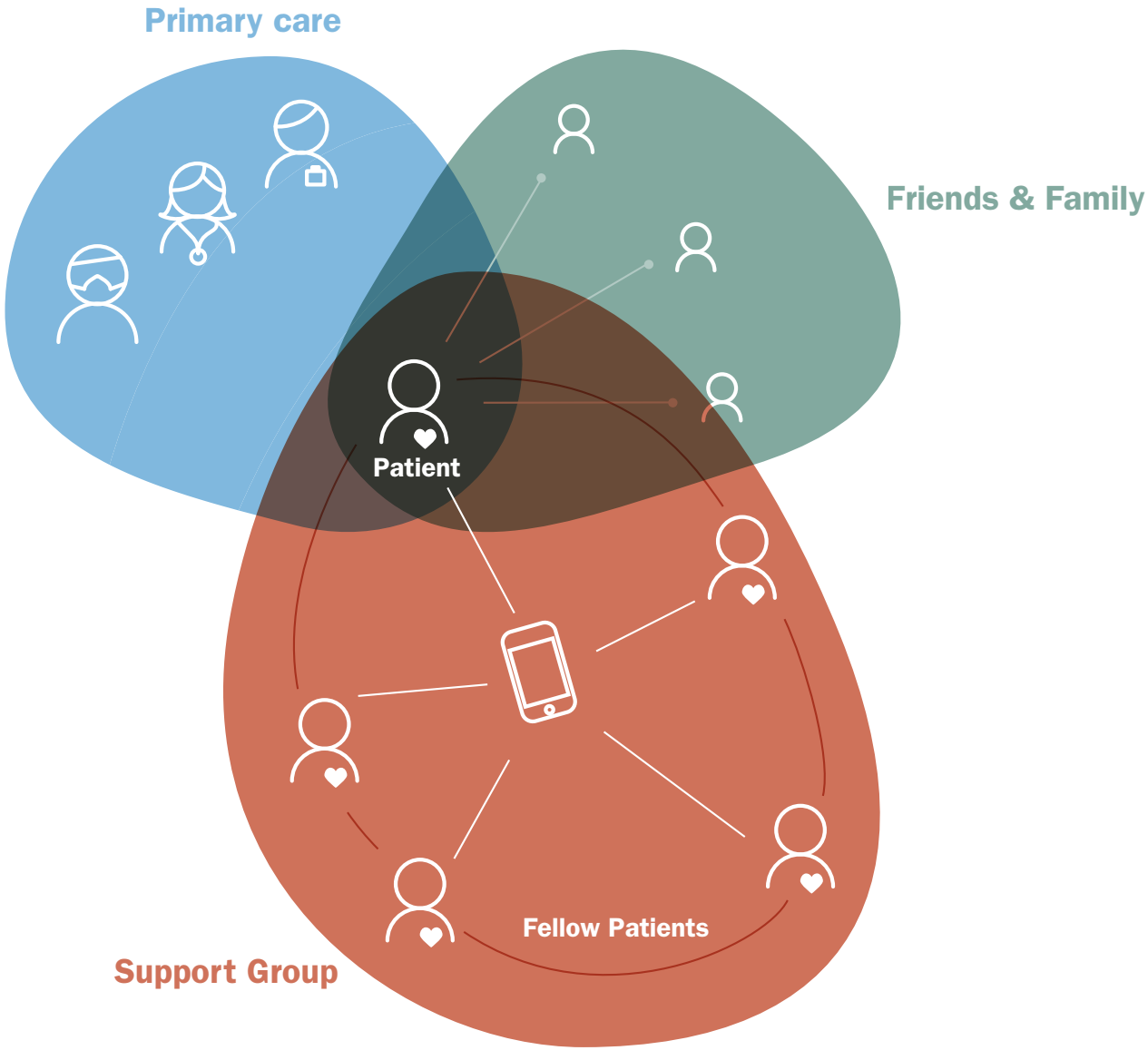
---

**Device as Coordinator**
The device coordinates between patients in the support group and triggers video and status recording (vignettes) for individual reflection and, optionally, for sharing at support group meetings.


Helping patients see and share.

| Pre-Diagnosis | Diagnosis | Get the CTM | Daily | Weekly | Complication | 3 - 6 Months |
|---|---|---|---|---|---|---|
| Establish Lifestyle<br>Make Decisions | Problem<br>Checkup<br>Informed | Introduce:<br>CTM<br>Support Group | Make decisions<br>Form new habits | S/G meeting | Symptoms<br>Emer. treatment | Checkup<br>CTM eval. |
|  Patient |  PC Team |  CTM |  Patient & CTM |  Support Group |  Specialist |  PC Team |
| Friends & Family | Friends & Family, Support group via CTM | | | | | |

**Journey Map 3**

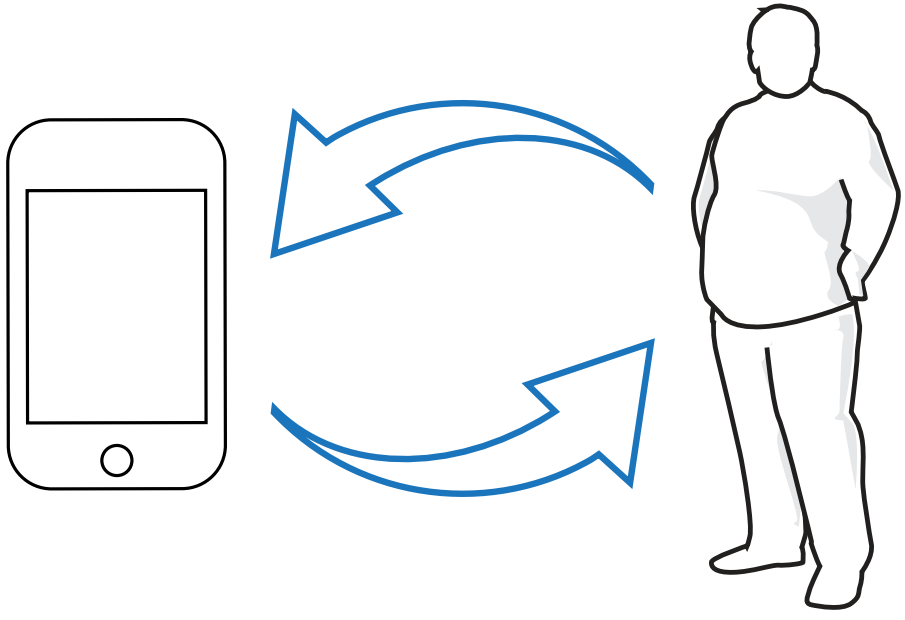

Primary care
Friends & Family
Patient
Fellow Patients
Support Group

# In the Beginning

**Patients use the device to learn.**

The first three months after diagnosis are a prime opportunity to educate patients about their illness and begin acclimating them to their new normal. Instead of educating patients on the first day or first three days alone, we extend the “bootcamp” period by providing an alternate teacher.

The Connected to Me device instructs the patient about what they should do to improve their condition and provides immediate information about how choices could impact or have impacted their health.



**The device learns about them.**

During the first three months, while the patient is learning about their illness, the device is learning about the patient.

By measuring adherence to instructions provided to the patient (compliance), the device establishes a profile of the patient and helps customize their care. By better understanding the patient, everyone can provide better care.

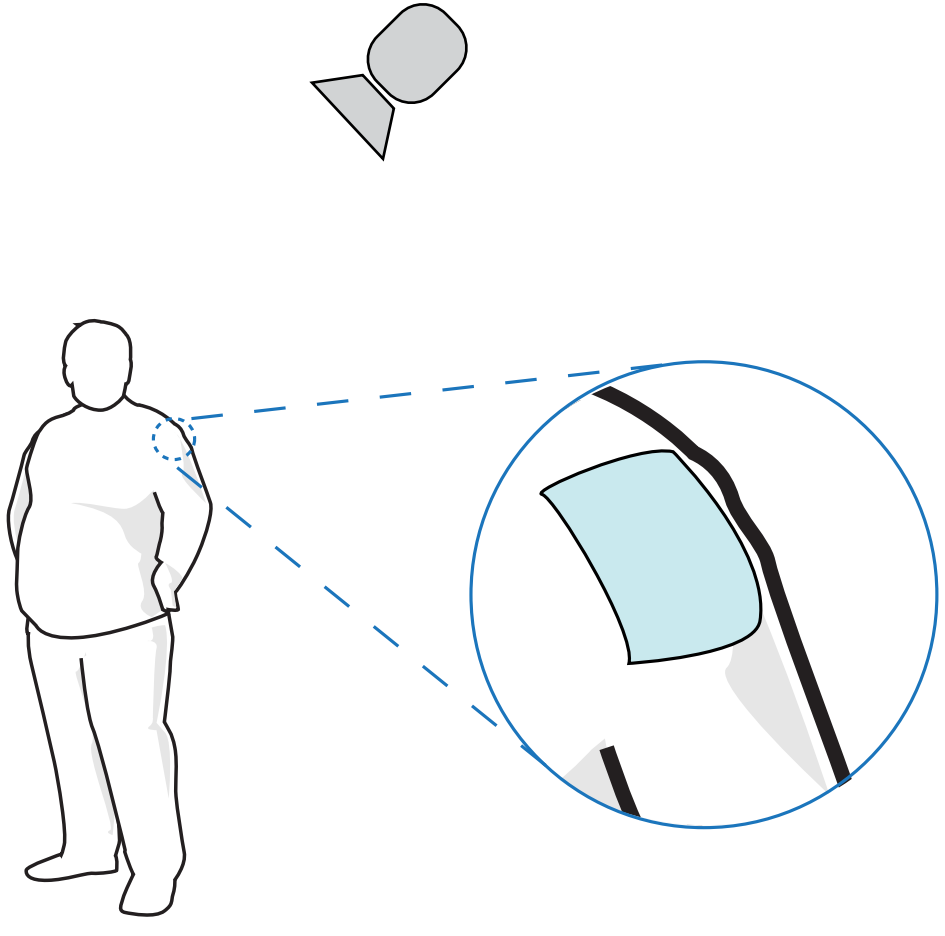
# Keep Track of Conditions

**Biometric sensing and context recording**

Using a sensor patch placed on the patient, biometric status information can be continuously monitored.

A video camera in the patient's environment allows for biometrically-triggered context recording. Video is buffered and snippets are saved when a spike in biometric data occurs or when the device autonomously recognizes that the patient is facing a difficult decision.

Together, the sensor patch and the environmental camera allow for the creation of *vignettes*: triggered recordings of the events leading up to and after a biometric data spike.



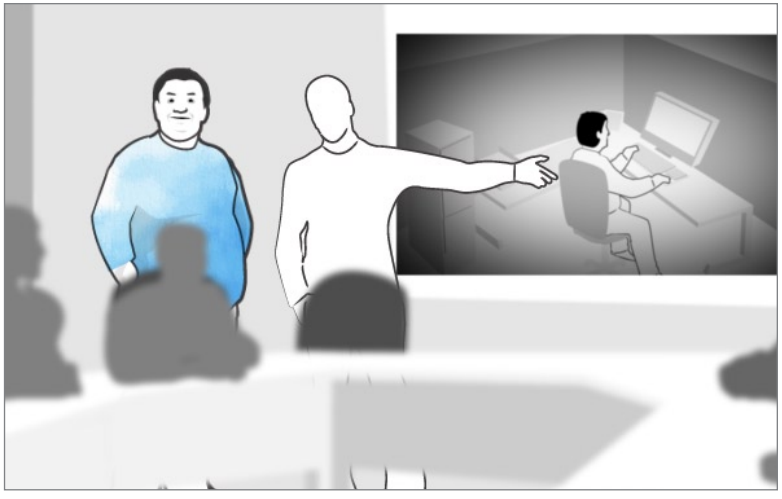
# Better Support Through Focus

**Using video to bring groups together.**

Patients can choose to share their vignettes at support group meetings. By focusing the discussion on a specific instance, vignettes keep the support group on task.

Sharing of both positive and negative vignettes allows patients to learn from each other's experiences. Discussion around these events may be guided by a moderator.

Since support group members are learning about the individual struggles and triumphs of their peers, they can educate, support and encourage each other in targeted ways.



# Keep Track of Stats

**Data Visualization**

The sensor patch conveys pertinent data to the device for analysis and the device creates real-time visualizations. Consequently, patients can better connect to and understand their stats. By visualizing the biometric impact of choices, patients can learn to alter their behaviors and keep their stats in check.

The interface is based on the iPhone stocks application. If people can check how their money is doing, why can't they check how their health is doing in the same way?

When stats change, the CTM system utilizes its understanding of the patient to suggest activities for the patient to assist in returning them to a healthy status.

# Connections

**Leveraging a social network for support.**

The device allows patients to update their status, much like a twitter feed. And since the support group members are connected to this feed, patients can leave comments for others, receive feedback on their updates and ask questions to the group.

This part could rely on existing social network status systems such as Twitter. By utilizing an existing network, Mayo's cost is reduced and patients don't need to signup for yet another network.


# The Gestalt

**The whole is greater than the sum.**

Connecting all of the pieces in our final concept creates a patient-centered system that supports, educates and motivates patients. The system allows patients to see and share their progress, potential, goals, and the impact of past decisions. As a result, patients and their support groups can develop individualized approaches for developing and internalizing the new normal.

nurses
emotion
personal
primary-care physicians
relationship
coordination
control
treatme
counselors
Integrat
case manage
cost
insurance
special
efficiency
informed
safety
quality
administration
billing
accountable
Affordable

# Expanding Focus

**To meet the needs of others**

While developing our system we focused on the needs of patients dealing with diabetes and other chronic illnesses. However, an individualized system of support, education, and motivation is not only applicable to chronic care patients. It can versatilely expand to meet the needs of patients in other healthcare situations.