


**The Problem**

*How to support patients in a uncertain world?*

The most significant interactions between patients and the health care system occur as dialog during the doctor's appointment. But how much of these critical conversations do we remember? How much do we understand? Are we prepared to adapt to unexpected future circumstances? Without empowering takeaways or a means to capture and annotate our discussions with doctors, the value and richness of these interactions is often lost.



 UNIVERSITY OF WASHINGTON MEDICAL CENTER Emergency Medicine Service (206) 398-4000 1959 NE Pacific St., Box 356123, Seattle, WA 98195-6123		<b>ED Discharge Instructions for:</b>	
Name: _____		Medical Rec #: _____	
Address: _____		Phone: _____	
Visit Date/Time: _____			
<b>Evaluation</b>			
Evaluation in the Emergency Department included triage, and a screening exam by the nurse. You were treated by the following Emergency Department staff:			
<b>Diagnosis-1</b>			
Based on the evaluation and tests, the following diagnoses have been made. Remember that these are preliminary diagnoses and follow up with your referral physician may be necessary.			
* BACK PAIN AFTER LP			
<b>Additional Instructions</b>			
* TYPE IN INSTRUCTIONS: The pain should continue to improve over the next few days, and is from the lumbar puncture you had. If you develop fever, increasing pain, or nerve symptoms (shooting pains, etc) please return to the emergency room.			
RETURN TO EMERGENCY: IF SYMPTOMS WORSEN.			
* RETURN TO EMERGENCY: FEVER, CHILLS			
* RETURN TO EMERGENCY: SIGNIFICANTLY INCREASING BACK PAIN			
I have received the above instructions on January 6, 2007 at 21:20. The risks and benefits of being discharged home have been explained to me and I agree with the plans outlined above.			
Signed: _____		Relation: _____	
Witnessed: _____			

An example status quo medical take-away.

Rushed to move on to the next patient's appointment.

Speaking with the precision of medical language.

Attempting to convey as much information as possible

Stressed out by the doctor's diagnosis and unfamiliar with specialized medical jargon.

Overwhelmed by the pace of the conversation, but pressured to seem like he understands and is in control.

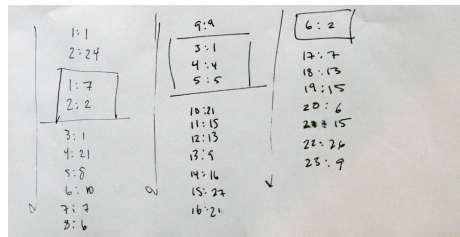
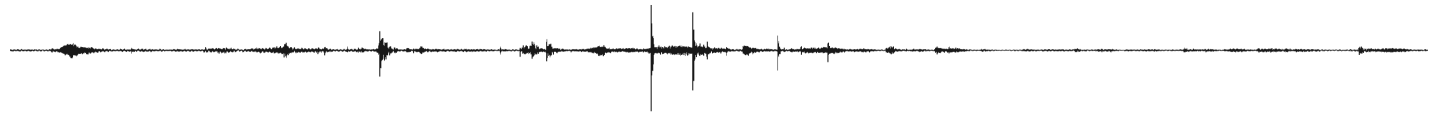
Unaware that he will be one of the few patients that experience the side effects of the prescription drug.

## The Problem

*How to organize and access the recordings?*

Research began by looking at text and audio to see what was best for reviewing conversation. After transcribing a recorded doctor's visit two important validations were reached: one, tone of voice and emphasis were lost in text subsequently diluting the importance of information, and two, mapping conversation to text did not enrich the information any more than the audio.

It was important to have as close to the original experience as possible otherwise context was lost. With the amount of information within an entire recording it was crucial to subdivide the dialog. Transcribing the audio revealed a pattern between the amount the doctor spoke (paragraphs) and the amount the patient spoke (one sentence).



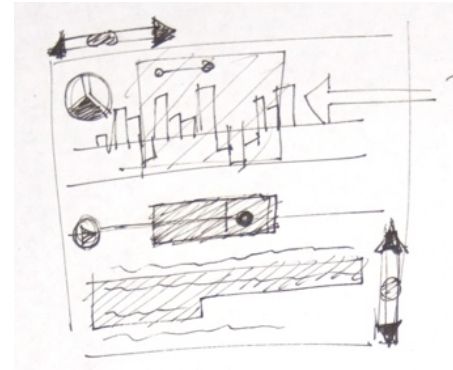
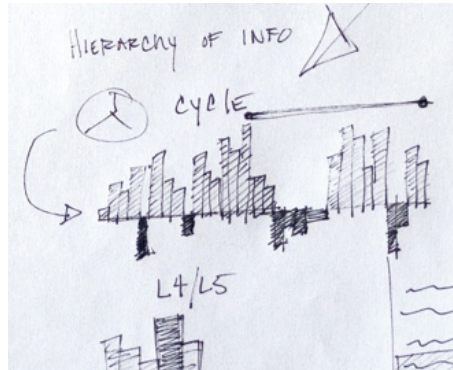
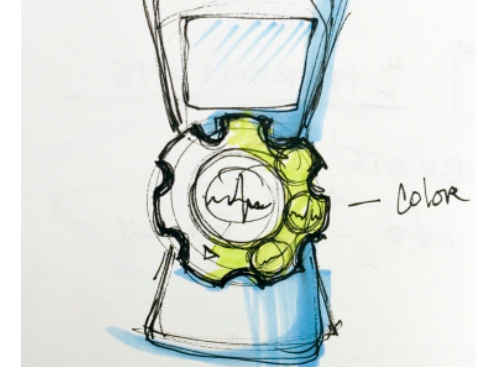
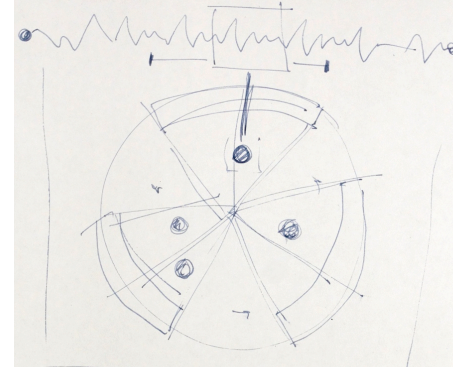
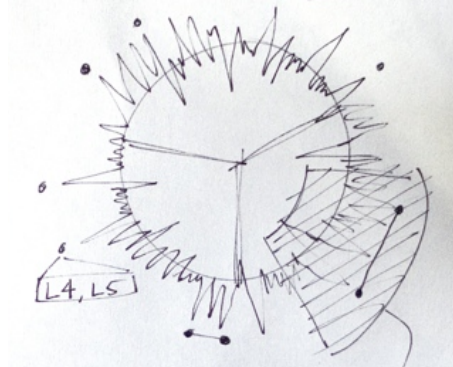
to see if you can tell the difference between normal and phase one. So look at yours, so see the difference here and then see that one. It starts to get a little foggier, so what happens when you loose some of your natural curve in here you get too much pressure on this disc, that sits in here. Do you remember when we were talking about the discs? And how important it is they act like a space saver? Its like a sponge—lets nutrients in and lets toxins out, but it can only do that when the pumping action with the spine so if the spine joint is a locked joint, like if you jam your finger, so if that joint isn't opening and closing, the toxins sit inside the disc and it starts to die, degenerate, same thing. The problem with that is the job of the disc is to hold the hole open the size of the base of that nerve... and this is thinning in size, this is going get more pressure placed... and where it goes is where your body is going to express pain—tightness, symptoms, dizziness, dysfunctions, all that. Lets focus on one, so we can look at it a little bit. Ok. So, a couple things. Do you remember when Doctor Mike had you lift both

100 pounds 14 pounds 15 20 15 years 2.5 20 lbs 20 minutes 20 pounds 20 years 3 jobs  
 3 months 3 steps 3 tips 36 visit 4 5 4 weeks 5 days 5 steps 5 5 months 50 lbs 6 week 6 weeks  
 6-8 weeks 65 hours 8 WEEKS 8-10 minute 80 improvement 9 months absolutely create  
 accident nothing else he looks worse than a hundred lb adjustment 24 adjustments car on  
 body starts body strength bone spurs bone spur bones decide bridge extra build MUSCLE  
 bulging disc case... high caused pain chronic care coming back consistently but conscientious ...  
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 create natural creating motion crisis care curve dark x-ray day LONG difficult now... direct trauma  
 dizziness dysfunctions doctor mike doctors ...and double kidney early athletic early warning easy stuff  
 episode of pain and numbness 15 minutes 15 months pain tightness extra bone fairly healthy for old  
 gonna beat gonna walk good service grad school great range half degrees hand side  
 happened yesterday happened... hardest part heel lets healing process healthy body healthy position  
 heavy things high left high paced hrm...you hole open huge accident...imagine losing  
 important part introduces motion is... aggressive jackhammer mim joint ish joints yoga kidney infection  
 left hand left hip left leg lets focus sets loves life style lifting pushing ligaments back light force  
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 structural change support exercises steps back step 40 40 things  
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 week mark week supports weeks weigh 100 working 2 working 65 worse recently wow swimming

### The Problem

*How should the device look, work & feel?*

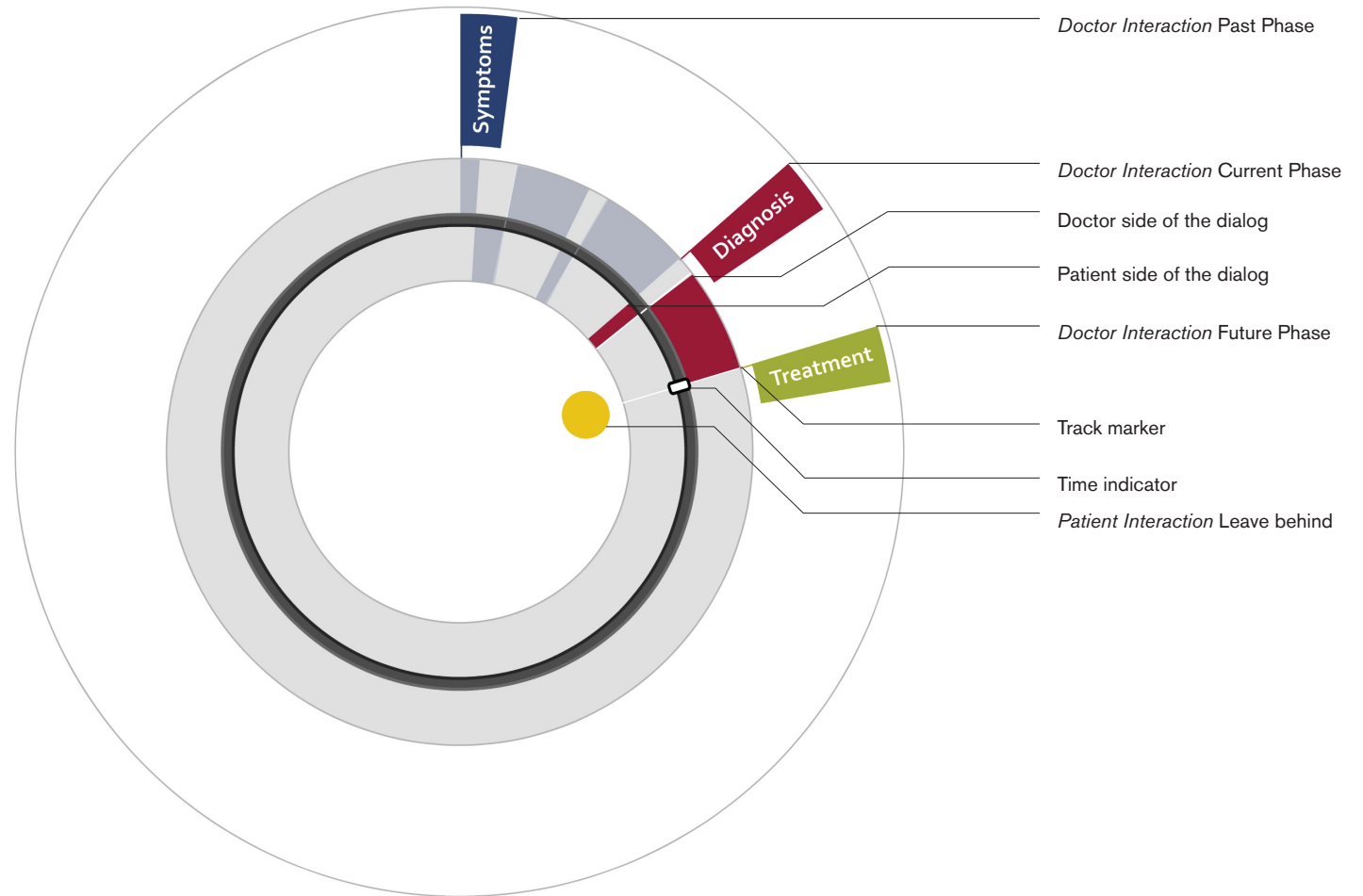
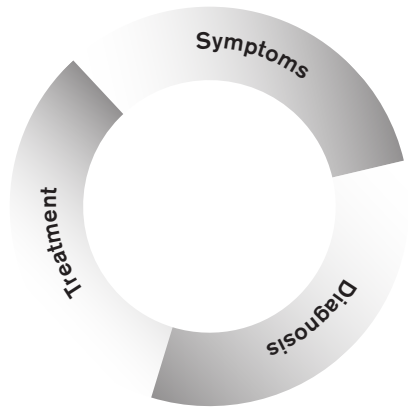
The reversal in dialog— where one person stops talking and the other starts— provides a clue into the mapping of dialog over time. This device needed to be on the table exposed. Sitting between the doctor and patient not as an observer but as a participant in the conversation.



### Design Solution

#### Dialog Map

The time line of the appointment is mapped to fit the medical cycle, a high-level model of medical practice. Broad phases: symptoms, diagnosis, and treatment and speaker reversals in conversation provide a meaningful frame of reference for organizing the audio recording.



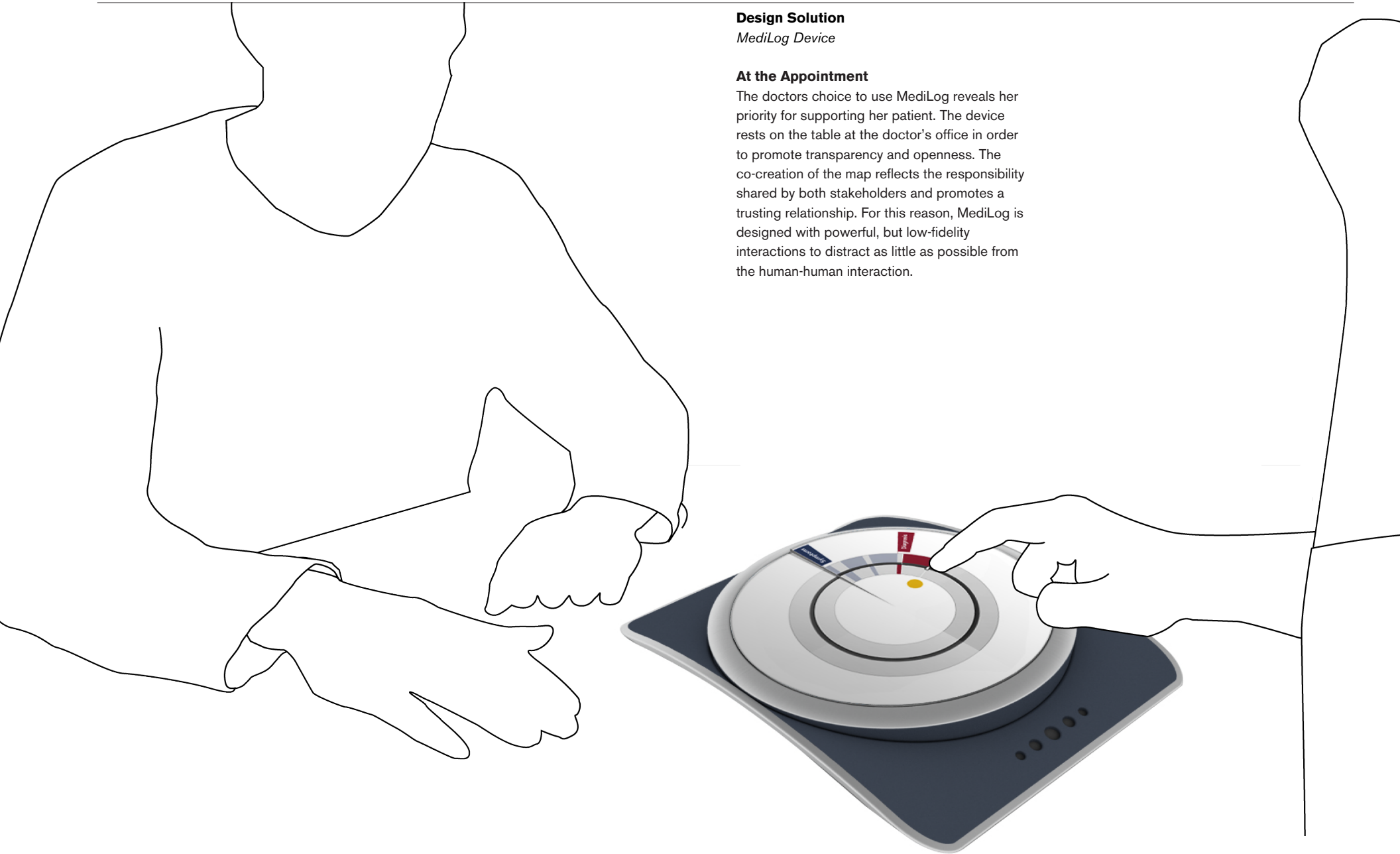
Low Fidelity interactions, such as the doctor phase-marking, provide organizational value but do not distract from the human-human dialog.

**Design Solution**

*MediLog Device*

More than a recording device, MediLog enables the doctor and patient to jointly construct a visual mapping of their interaction. Through bread crumbs and phase labeling the enhanced recording promotes real-time comprehension of the dialog and provides a means for efficient access to key segments when reviewed.





**Design Solution**

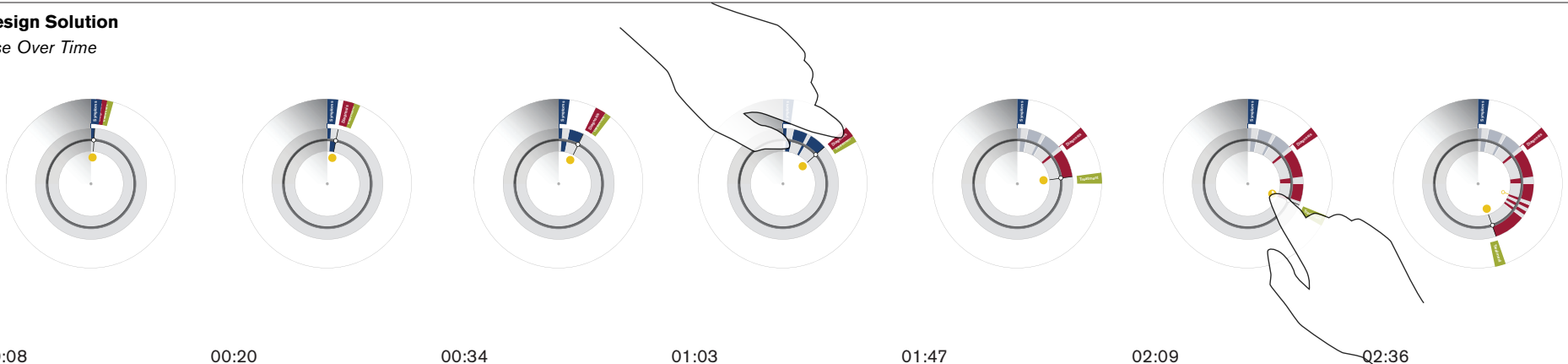
*MediLog Device*








**At the Appointment**

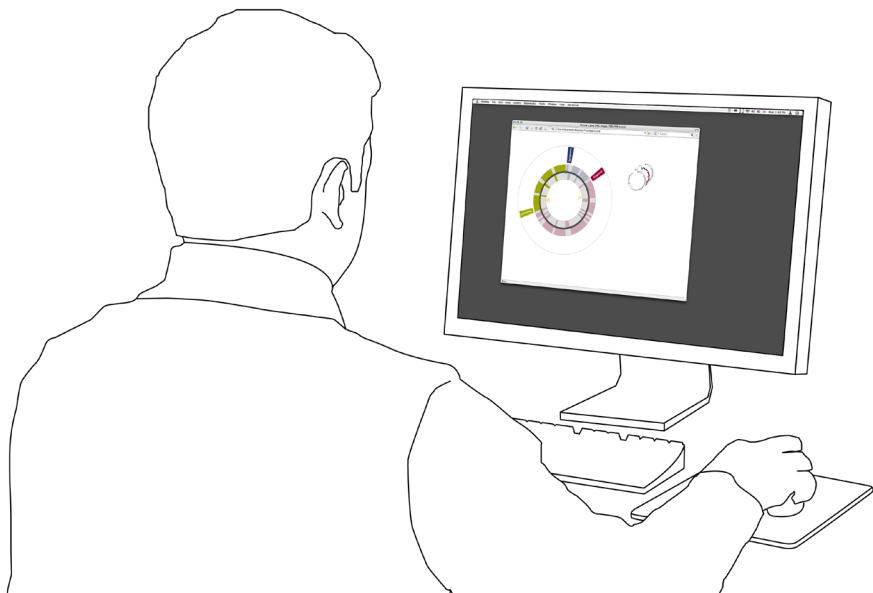
The doctor's choice to use MediLog reveals her priority for supporting her patient. The device rests on the table at the doctor's office in order to promote transparency and openness. The co-creation of the map reflects the responsibility shared by both stakeholders and promotes a trusting relationship. For this reason, MediLog is designed with powerful, but low-fidelity interactions to distract as little as possible from the human-human interaction.

**Design Solution**

*Use Over Time*



<p>00:08</p>  <p>The conversation between patient and doctor is mapped, like a dialog shot in film, revealing the speaker reversals that structure the audio map.</p>	<p>00:20</p>  <p>The patient responds to the doctor's question and this shift is revealed in the map on the device.</p>	<p>00:34</p>  <p>The doctor responds and continues to discuss the patient's symptoms.</p>	<p>01:03</p>  <p>The doctor indicates a shift from the discussion of symptoms to her diagnosis. This high-level organization is designed to help the patient organize and browse in the future.</p>	<p>01:47</p>  <p>The doctor discusses her diagnosis of the patient's symptoms.</p>	<p>02:09</p>  <p>The patient leaves behind a marker when he heard something that he wanted to double-check later. These temporal bookmarks can be added and annotated later.</p>	<p>02:36</p>  <p>The doctor continues to discuss the diagnosis.</p>
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**MediLog Beyond the Appointment**

After the appointment, the audio recording and map are transferred to the patient so that he can annotate the map, review the conversation, and share it with other care-providers.