CRONOS + budi
The medical instrument of the future is…
Usability Testing

Clarity of Information:
User Name, Age, Location, List of my patients, Navigation options

Navigation Tasks
Patient page, Place Order, Send Message, Pull-up Detailed Patient information, Sign-Out
Clarity of Patient Information

Clear Patient information:
- Age
- Location

Unclear information:
- User name
- My patients
Ergonomic guidelines for User-Interface Design:
(Hix & Hartson, 1993)

Blue - good background
Use high color contrast

Current color contrast:
patient selection & order icon

- Low color contrast
- Risk of Chromostereopsis
Terminology

- Timeline
- Whiteboard

Ambiguity

- Expansion for additional menu options
Timeline: Some slight confusion as to what timeline referred to.

Suggestion: Maybe making the page name more intuitive possibly calling it “Chart”

Whiteboard: Back to Home screen (redundancy)
Priority of Patient information

- Current vs. Past history

Patient Chart

Name, age, sex, vital signs, main complaint, lab data, medication data
Past medical history
Some users clicked CRONOS title to sign out.

Sign Out & Log Out icons more difficult to find.

Suggestion:
- keep CRONOS title log out
- combine sign out & log out icons
- include cue to lead users to other icon pages
The use of simple iconic elements such as arrows can give some sense of action and a small affordance as to what happens when a user performs an action.

Partially visible icon implies affording swipe action.
Small button has low performance in terms of success rate and number of errors.

- 0.38 inch × 0.38 inch
- Larger buttons in inappropriate regions
- Larger buttons for users wearing gloves
Consistency throughout the app can improve performance and reduce learning time.

- Unify button appearance
- Unify title and navigation pattern
- Unify font, background color, gesture
Eye tracking - Scenario based tasks that asked users to take the position of a doctor using CRONOS.

n= 10 Cornellians with no prior experience of the CRONOS interface.
<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>Gender</th>
<th>Diagnosis</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anmol, Goo</td>
<td>27Y</td>
<td>M</td>
<td>Head Ache</td>
<td>ED A</td>
</tr>
<tr>
<td>Flower, Rose</td>
<td>2Y</td>
<td>F</td>
<td>Nausea</td>
<td>RAD</td>
</tr>
<tr>
<td>Gomter, Megz</td>
<td>42Y</td>
<td>F</td>
<td>Stomach Pain</td>
<td>WA</td>
</tr>
<tr>
<td>Tinkle, Abrac</td>
<td>62Y</td>
<td>F</td>
<td>Diarrhea</td>
<td>WA</td>
</tr>
<tr>
<td>Uzebker, Surek</td>
<td>32Y</td>
<td>M</td>
<td>Vomitting</td>
<td></td>
</tr>
</tbody>
</table>
User task: Identify the age of the only male patient listed.
Sample was only 60% accurate at identifying patient by gender.

Time to first fixation on correct gender symbol: 7.2 seconds.

Time to identify gender of patient: 11.4 seconds.
Giving a face to the patient

Icons can improve patient identification
User task: Identify the age of the only female patient listed.
Sample was **90% accurate** at identifying patient by gender. **30% improvement**

Time to first fixation on correct gender symbol: **4.2 secs**  
**42% faster**

Time to identify gender of patient: **8.1 secs**  
**29% faster**
Patient priority means patients come first

Arrange information to guide a doctor's gaze through patients
Patient Priority

Patient priority means patients come first.

Icons can help doctors to quickly identify patient information.
Information hierarchy should be accurately reflected by design.

Survey and eye tracking suggest the current alert is difficult to find and not viewed as urgent.
Information hierarchy should be accurately reflected by design.

Survey and eye tracking suggest the current alert is difficult to find and not viewed as urgent.
Location on top reflects its importance.

Red color and symbol match the alert button and are associated with urgency.

Important information listed.
Priority of Information

Location on top reflects its importance.

Red color and symbol match the alert button and are associated with urgency.

Important information listed.
60% of sample did not notice bottom blue alert

Avg. Time until first fixation on alert: 5.3 s

100% of sample noticed top red alert

Avg. Time until first fixation on alert: 1.9 s
Visual alerts work only when the doctor looks at the phone.

Consider vibration or sound to alert doctors to urgent information without having to look at phone.

Possibly connected to location.
Selective Attention

Only so much information can be processed at once.

Consider including function to address alert later.
Selective Attention

Only so much information can be processed at once.

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Consider including function to address alert later.
The Future is CRONOS!

My patients shown at top (with icons)

Inverted black highlight

Patient triage, weighted by acuity
The Future is CRONOS

Visual Clarity

Patient Priority

Consistency: Layout

Consistency: Terminology

Priority: Alerts