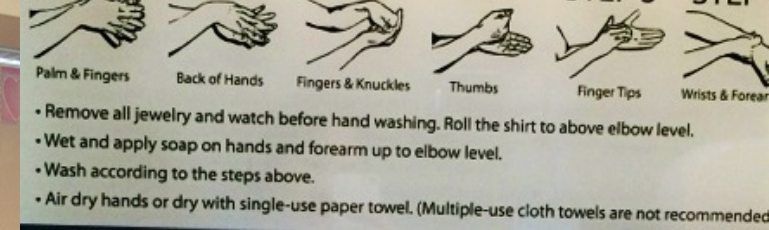




a project by **Evan Barry, Jiakun Li, Olivia Wu**

Redesigning the Neonatal ICU
Stanford, CA





Date: Nov 16, 2013 (SAT) Baby: ↳ BSAHA
 Today's Weight: 950gms Parents: Miriam & the
 Plan of Care / Goals: KANGEROO - GAIN WEIGHT -
ENROLL U-FF
 Nurse: Ella Feedings: PO - SEE NOTES
 Nurse Practitioner: COMP.! Breast Milk in Refrigerator
 Neonatologist: Dr. [unclear] Bath: 1/16/13 - 2:30 PM
 Notes: WATER 10:00
PO 9:00 AM - 10:00 AM - 11:00 AM -





Handwashing instructions:

- & Fingers
- Back of Hands
- Fingers & Knuckles
- Thumbs
- Finger Tips
- Wrists & Forearms

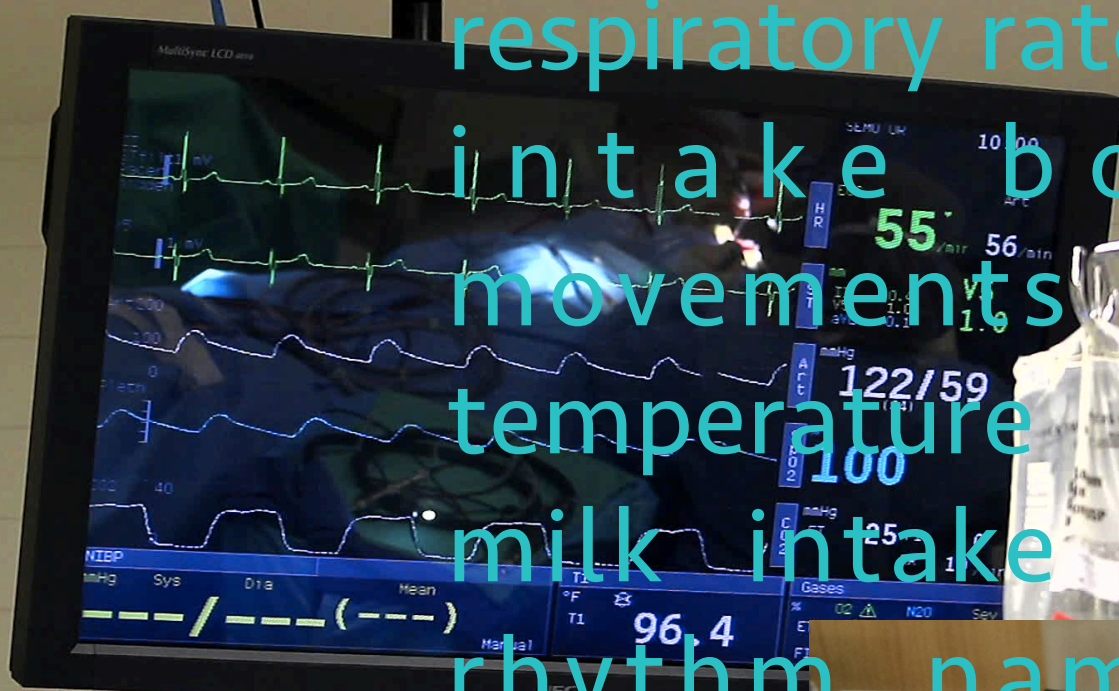
Remove all jewelry and watch before hand washing. Roll the shirt to above elbow level. Wet and apply soap on hands and forearm up to elbow level. Wash according to the steps above. Dry hands or dry with single-use paper towel. (Multiple-use cloth towels are not recommended.)

Chart notes:

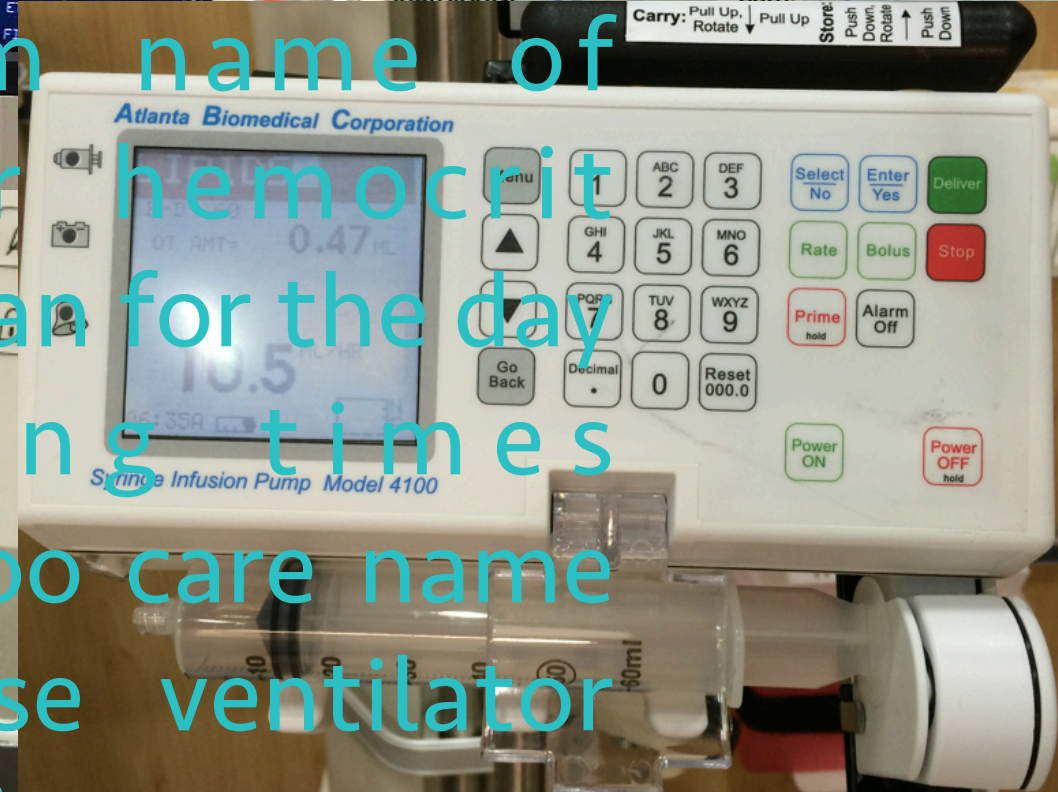
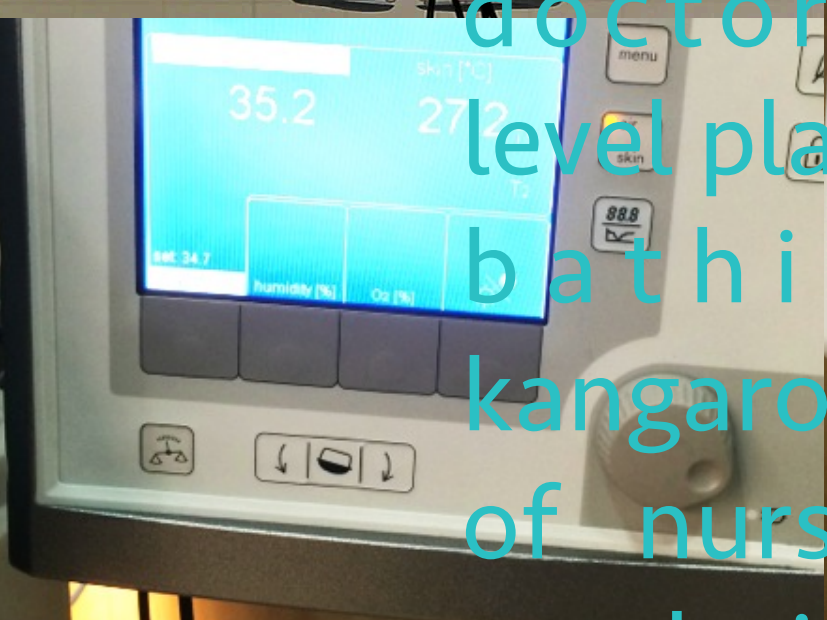
- Date: Nov 16, 2013 (SAT)
- Baby: bsack
- Day's Weight: 950gms
- Parents: Mum & Dad
- Plan of Care / Goals: KANGEROO - GAIN WEIGHT - ENROLL U-FF
- Diagnosis: EUA
- Feedings: PO - SEE NOTES
- Referring Practitioner: Comp.!
- Breast Milk in Refrigerator:
- Pathologist: Dr. [unclear]
- Bath: 10 min - 20 min



respiratory rate
fluid intake
bowel movements
body temperature
breast milk intake
heart rhythm
name of doctor
hemocrit level
plan for the day
bathing times
kangaroo care
name of nurse
ventilator regulation



A form with instructions for hand hygiene and patient care. The instructions include: 'Remove all jewelry and watch before hand washing. Roll the shirt to above elbow level. Wet and apply soap on hands and forearm up to elbow level. Wash according to the steps above. Dry hands or dry with single-use paper towel. (Multiple-use cloth towels are not recommended)'. Below the instructions, there are fields for 'Baby: [Handwritten: bsack]', 'Baby's Weight: [Handwritten: 950gms]', 'Parents: [Handwritten: Mamma & Pa]', 'Plan of Care / Goals: [Handwritten: Kangaroo - Gain Weight]', 'Nurse: [Handwritten: Eula]', 'Feedings: [Handwritten: PO - see notes]', 'Breast Milk in Refrigerator: [checkbox]', and 'Bath: [Handwritten: 1/1/13 - 10:00 AM]'. There is also a field for 'Physician: [Handwritten: Dr. ...]'.



...Is my baby going to be okay?

We talked to **parents, nurses, doctors...**

“I’m a fan of too much information...there is **nothing a parent should not be entitled to know.**”

“We need to be able to **communicate** every piece of information on an eighth grade level”

“I can get the information, Google it...but I’m not a doctor, so **I don’t know what’s important.**”

“If something bad happens, parents feel like they would have caught it given **more information**”



Nina
parent



Katie
nurse



Janene
NICU fellow



Janice
nurse



Liz
parent

point of view

Kelly wants to stay **informed**, but feels **overwhelmed** by all of the data and has a **difficulty understanding** the information without a nurse.

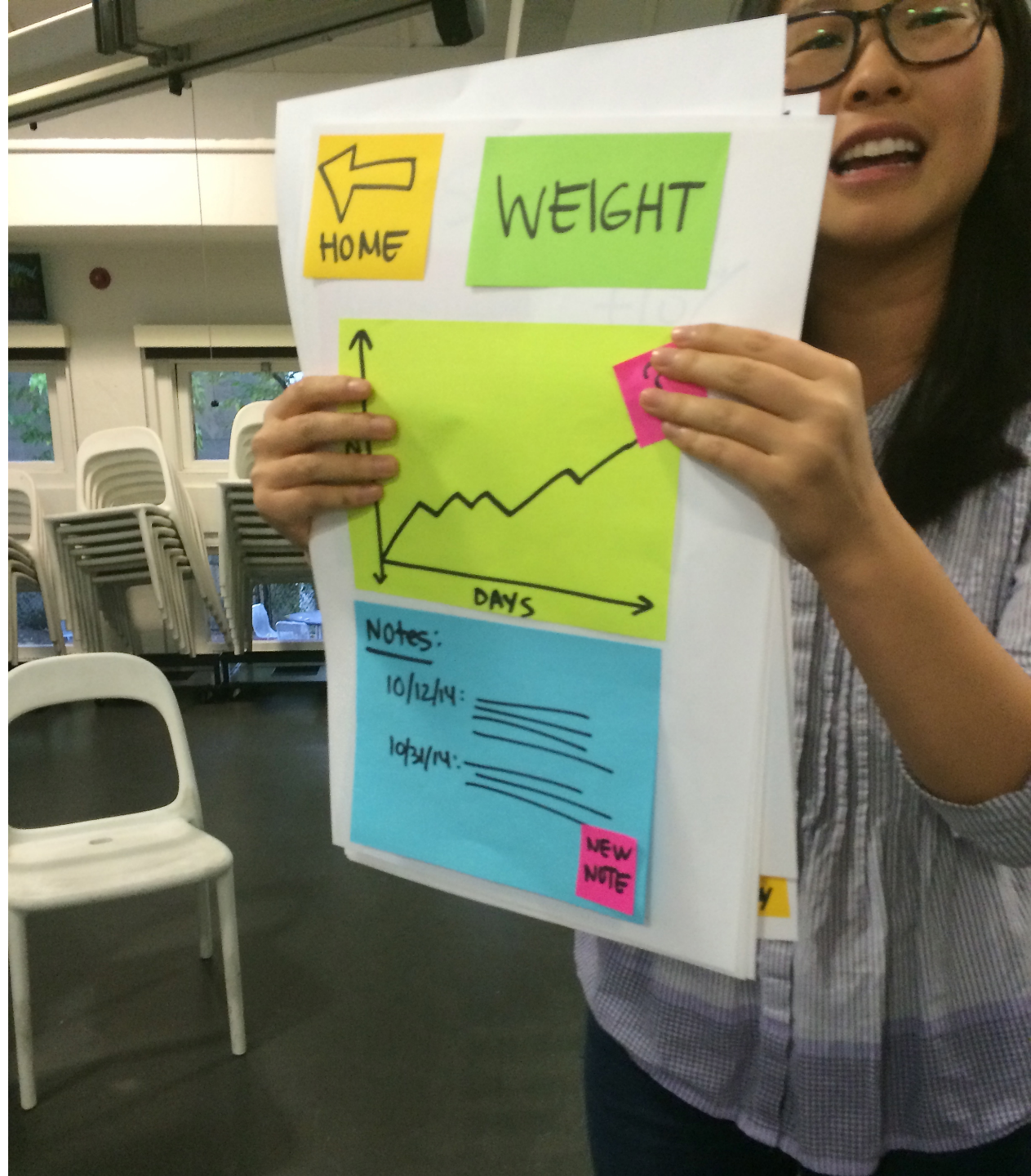
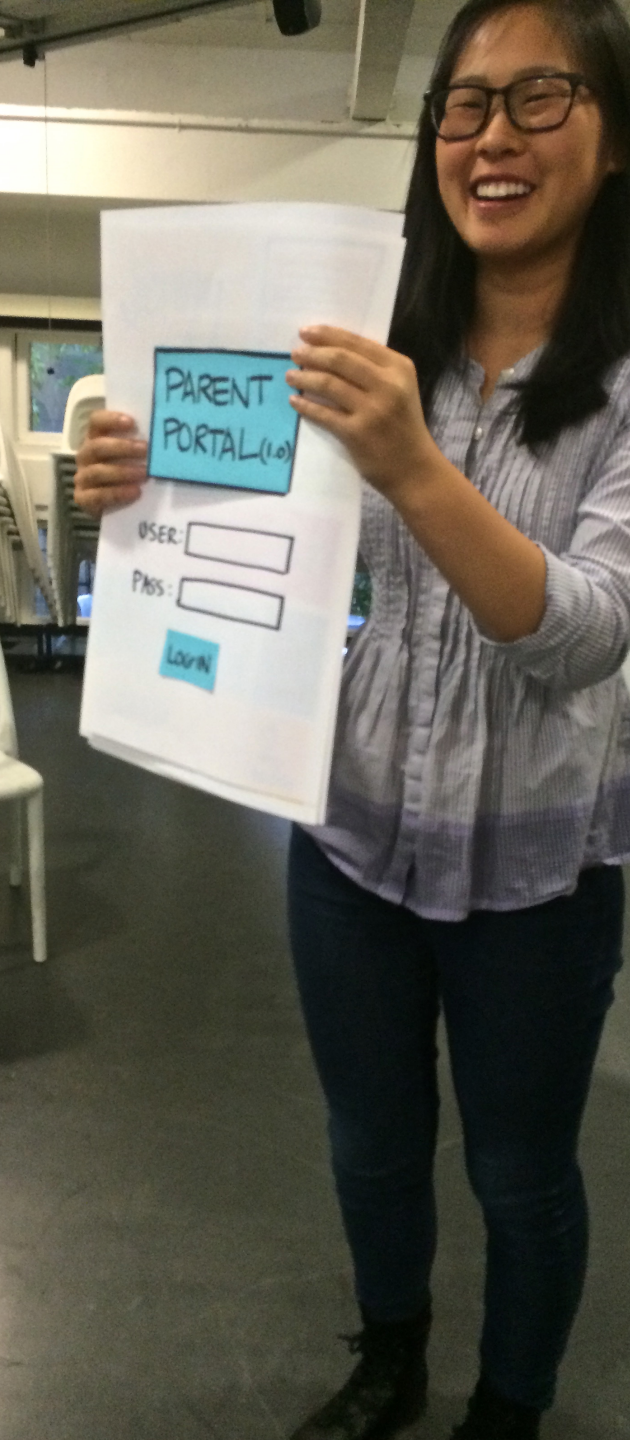
how might we

translate already **existing data** into **understandable** stories and trends?



first prototype

- Web-based application
- Make NICU more understandable
- Components
 - Status updates with trend reports
 - Daily plan
 - Messaging portal with nurses
 - Medwiki
 - Photos
 - Notes



feedback

Simplicity is key

Information input logistics

Extra burden on nursing staff

Nurse/parent priorities

What if baby isn't doing well?



Nick, parent
Graham's Foundation



Scott, parent
Will's Way Foundation



Brittany, parent
Will's Way Foundation

reaction

Simplicity is key → answer “Is my baby OK?”

Information input logistics → be wary of EPIC

Extra burden on nursing staff
Nurse/parent priorities → remove nurse input

What if baby isn't doing well? → this was a challenge.

how might we

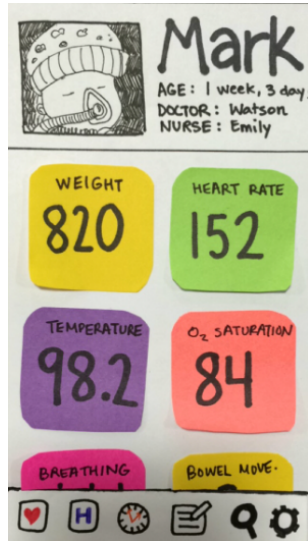
empower and make parents feel more comfortable by helping them organize their NICU experience?



second prototype

- Digitized
- More playful/user-friendly
- Can add metrics
- Added hospital component
- Language settings
- Removed back/forth messaging
 - Only nurses push notifications

www.tinyurl.com/NICUportal2



Mark
AGE: 1 week, 3 days
DOCTOR: Watson
NURSE: Emily

WEIGHT: 820
HEART RATE: 152
TEMPERATURE: 98.2
O₂ SATURATION: 84

BREATHING:
BOWEL MOVE:

Navigation icons: Heart, Home, Clock, List, Search, Settings



14 2

MEDICATIONS:
SUMMARY:

NEW: +

Navigation icons: Heart, Home, Clock, List, Search, Settings



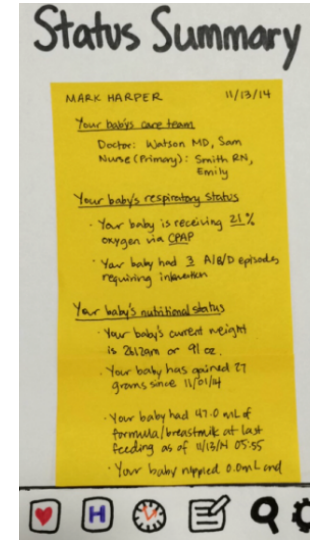
Schedule

BABY OTHER

DAY	WEEK	MONTH	YEAR
9:00			
10:00	Kangaroo Care		
11:00			
12:00		Support Group	
13:00			
14:00	Bathing		
15:00			
16:00			

+ NEW SYNC

Navigation icons: Heart, Home, Clock, List, Search, Settings



Status Summary

MARK HARPER 11/13/14

Your baby's care team
Doctor: Watson MD, Sam
Nurse (Primary): Smith RN,
Emily

Your baby's respiratory status
- Your baby is receiving 21% oxygen via CPAP
- Your baby had 3 AIB/D episodes requiring intubation

Your baby's nutritional status
- Your baby's current weight is 2817gm or 91 oz
- Your baby has gained 77 grams since 11/01/14
- Your baby had 47.0 mL of formula/breastmilk at last feeding as of 11/13/14 05:55
- Your baby nipple 0.0mL and

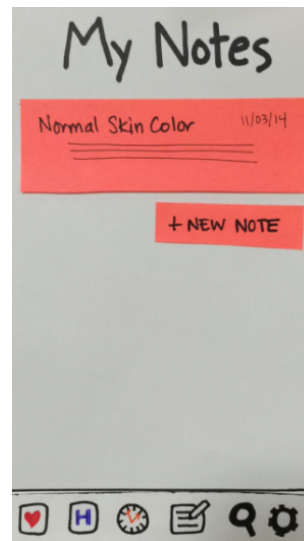
Navigation icons: Heart, Home, Clock, List, Search, Settings



Hospital

MAP:
FOOD:

Navigation icons: Heart, Home, Clock, List, Search, Settings

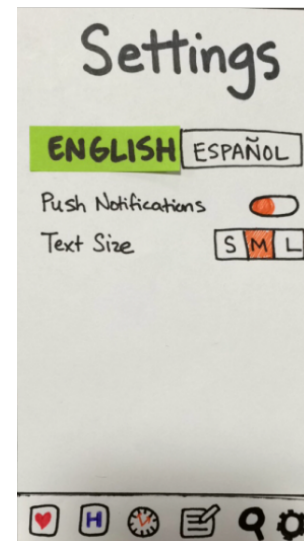


My Notes

Normal Skin Color 11/03/14

+ NEW NOTE

Navigation icons: Heart, Home, Clock, List, Search, Settings



Settings

ENGLISH ESPAÑOL

Push Notifications:

Text Size: S M L

Navigation icons: Heart, Home, Clock, List, Search, Settings

feedback

Importance of journaling

Flexibility

“Even if my baby wasn’t doing well, I’d want to know. And do something about it.”

Information format



Mark
Creche Innovations



Jennifer, parent
Hand to Hold

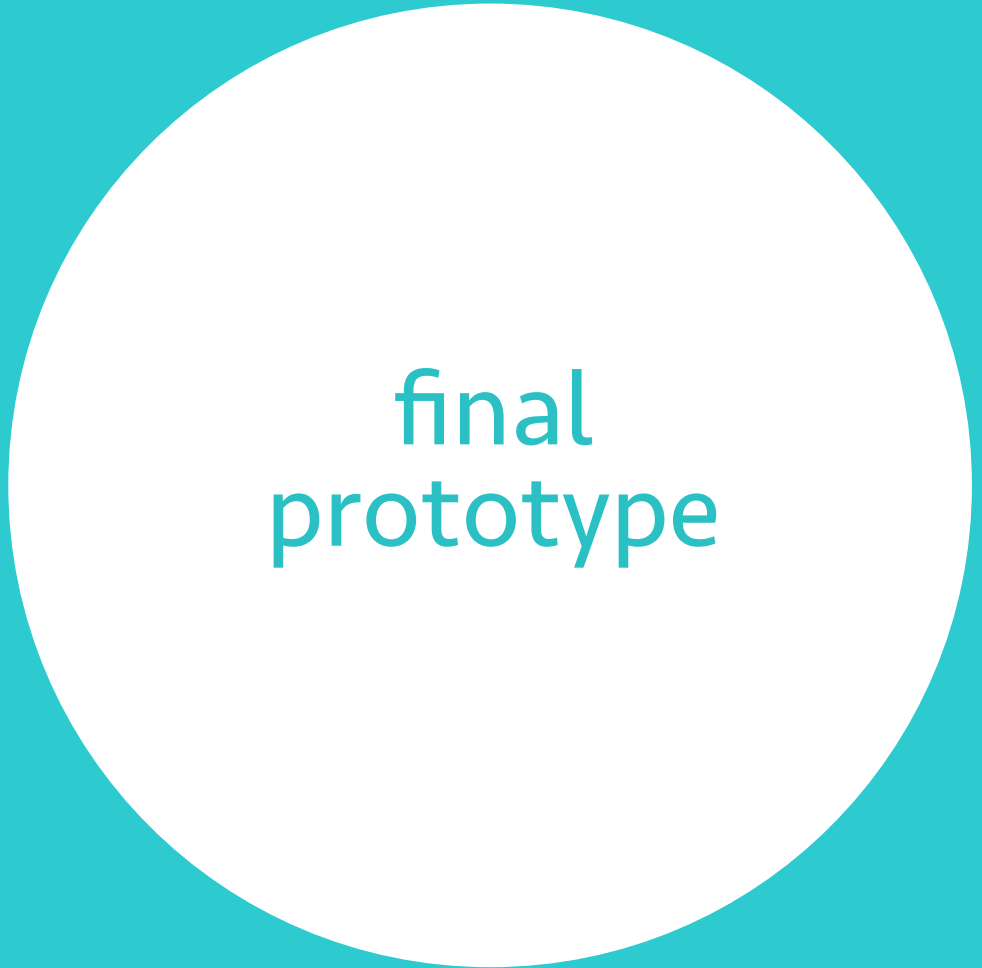
reaction

Importance of journaling → combine notes and photos

Flexibility → modular metrics

“Even if my baby wasn’t doing well, I’d want to know. And do something about it.” → consider notification system, include how to contact nurse

Information format → consider units, context



final
prototype

key problems

Parents...

- may **not know care schedule** to plan when to come in
- are not always immediately **notified of changes** to baby's care
- feel like they're **getting in the way** of nursing staff and don't want to disturb them with questions
- feel **overwhelmed with machines** and numbers
- are given a lot of information and **don't always remember** it or write it down
- are **not aware of the resources** the hospital has

Español



PARENT PORTAL



USERNAME



PASSWORD

Sign In



Mark
1 week 3 days

Doctor: Watson
Nurse: Emily

WEIGHT

TEMP



Emily

Ventilation



1 hr ago

Mark just had a major drop in his O2 levels and we needed to get him on an ventilator. He is stable now.



MEDICATION



NEW



Home



Hospital



Sched



Journal



Settings



Care Team

Doctor



Cohen MD, Watson

Room 202
111-111-1111

Primary Nurse



Emily NP

Room 202
111-111-1111

Nurse



Joy

Room 202
111-111-1111



Home



Hospital



Sched





Journal



Settings

October 2014						
SUN	MON	TUE	WED	THU	FRI	SAT
25	26	27	28	29	30	1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31	1	2	3	4	5

Plan of the Day

9: 00 10: 30	Kangaroo Care	 <i>Emily</i>
13: 45 14: 30	Bathing	 <i>Joy</i>



Home



Hospital



Sched



Journal



Settings



Mark
1 week 3 days

Doctor: Watson
Nurse: Emily, Joy

WEIGHT

1612

gms

TEMP

98.2

°F

HEART RATE

152

/min

O₂ SATURATION

85

%

MEDICATION



NEW



Home



Hospital



Sched



Journal



Settings



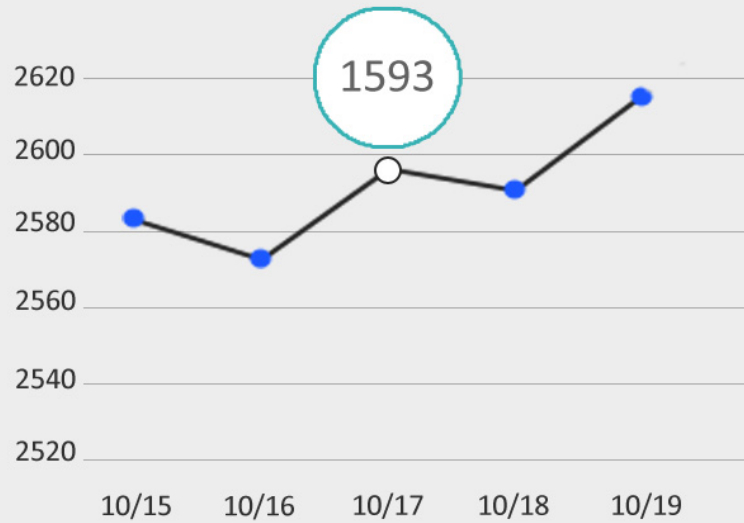
Weight

1612  27 1 day ago
 125 1 week ago
gm/lb./oz.

Day

Week

Month



Home



Hospital



Sched



Journal



Settings



Mark
1 week 3 days

Doctor: Watson
Nurse: Emily, Joy

WEIGHT

1612

gms

TEMP

98.2

°F

HEART RATE

152

/min

O₂ SATURATION

85

%

MEDICATION



NEW



Home



Hospital



Sched



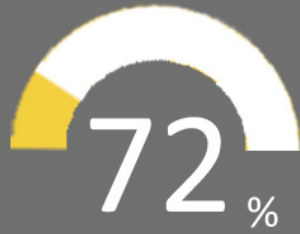
Journal



Settings



O2 Saturation

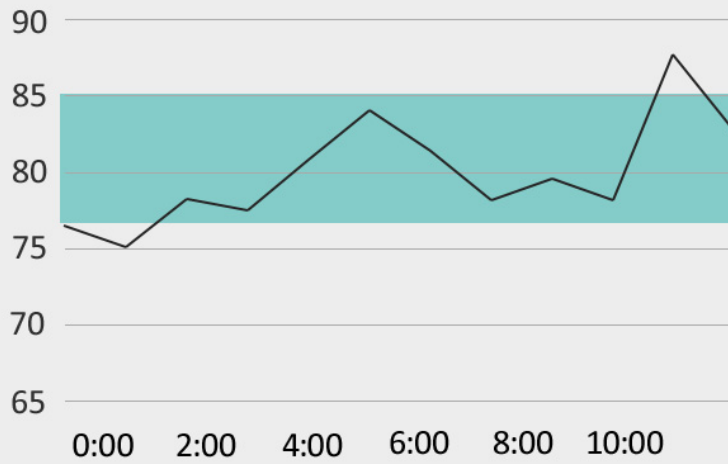


Highest: 88
Lowest: 72
in 24 hrs

Day

Week

Month



Home



Hospital



Sched



Journal



Settings



O2 Saturation

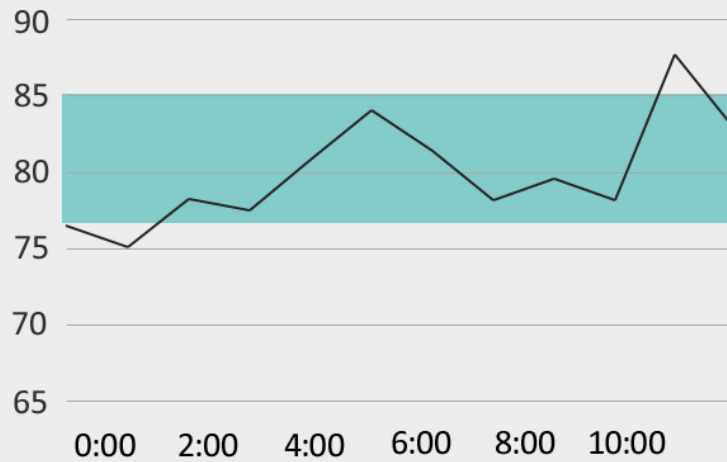


O2 saturation measures the quantity of hemoglobin in the blood that is saturated with oxygen.

Day

Week

Month



Home



Hospital



Sched



Journal



Settings

October 2014



Gaining weight, with fewer desaturation on CPAP than yesterday!

10:02 AM

15
Sat



Questions

What is NG tube?
What is NEC?

2:02 PM

14
Fri



Home



Hospital



Sched



Journal



Settings

Cancel

Journal

Save

Oct. 19, 2014



Q W E R T Y U I O P

A S D F G H J K L

⬆ Z X C V B N M ⬇

123 🌐 space @ . return

Hospital



PATIENT



FAMILY



SUPPORT



LuPa Café

Room 3-201

.....



Family Lounge Room

Room 3-204

.....



Nearby Restaurants

.....



Home



Hospital



Sched



Journal



Settings

Hospital



PATIENT



FAMILY



SUPPORT

- NICU classes

10:00 am NICU 101

Topics include unit orientation, your baby's team, visitation guidelines, an introduction to monitoring equipment, and much more!

- Breastfeeding Support Group

8:00 pm Room 2-204

A group where moms can get advice and information, as well as meet other NICU moms and share experiences. This group does not meet every Monday, so look for postings at the HUC station, milk depot, bedside flyers, or ask your BEST team member



Home



Hospital



Sched



Journal



Settings



Mark
1 week 3 days

Doctor: Watson
Nurse: Emily, Joy

WEIGHT

1612

gms

TEMP

98.2

°F

HEART RATE

152

/min

O₂ SATURATION

85

%

MEDICATION



NEW



Home



Hospital



Sched



Journal



Settings

last prototype

- www.tinyurl.com/NICUportal3
- Removal of Medwiki
- Clarifying notification system
- Integration of components
 - Journal = notes + photos
 - Schedule = care team + daily plan

future direction

- Logistics of EMR integration
- Test with a small group of users at LPCH
- Expand usage to other departments
 - PICU, other ICU?

thank you!