

## Insights From LPCH Visit 1/14/16

Jennifer Adams:

### Lucille Packard Tour L&D

Head Nurse: Jane

- 4 surgeries / inductions per day → 10 labor rooms
- leaving room for walk-ins.
- Average: 5000 deliveries
- invasion before delivery, or else C-section needed
- Decrease C-section rate: peanut ball to decrease rate (open up pelvis)
- catheter insert in cervix / balloon → high risk: high BMI
  - poor predicting cervix / bring in bariatric beds
  - ↳ Bishop score

\* Workarounds: equipment gets lost → tagged with metal labels

- intubate baby: laryngoscope and blades → need
- room turnover / EPIC
- neonatal trays are single use → lots of wastage
- Medical supply recycling
- Highest injury rate → stem from
- electronic fetal monitoring / physical printing (archived)
  - records baby's heart rate condition before birth for court cases.
- $\frac{2}{3}$  of doctors and nurses jobs is documentation
- Different committee's L&D / OB + standard review for change
- Ape aseotomy (cut the cervix a little) → Ice pack is not a good healing agent.
  - fully bulb → filled with cold water → insert in cervix
- \* Matuna

OR: more bed warmer near to mom → they can see baby

- clear path for nurse to access baby

Emily Pang

## **Insights from Visit to Stanford's Lucille Packard Children's Hospital**

This past Tuesday, our class trekked out to the Lucille Packard Children's Hospital to take a tour of the Labor & Delivery floor and speak with Patient Care Manager Jane Brinkerhoff. This was a wonderful opportunity for us to immerse in the L&D environment and see for ourselves the various setups and bugs that may exist in the process. Here are the three main insights that I gained from our visit:

### **1. There are numerous workarounds that sacrifice efficiency for security**

A "workaround" was a term that Jules taught us during our visit to LPCH: it usually entailed a method that the user devises to overcome a problem, hassle, or limitation in his/her environment. It seemed as if the L&D floor had experienced numerous workarounds over the years, mostly regarding the need to be confident about the patient's safety and security. This is understandable, as the patient's health is the utmost priority within the situation.

Firstly, Jane told us about the inefficiencies of the delivery packets that the floor had. Generally, the floor shared between 12-17 delivery packets, in which contained all the possible materials that a nurse or clinician may need in a typical delivery situation. There were additional packets for C-sections or premature deliveries, but each needed to be separately retrieved and contained an itemized list of materials inside that had all been sterilized and packed. Because of Stanford's standards, however, these items often had to be inventoried and cleaned in another building that accounted for materials from numerous units. This meant that supplies were oftentimes mixed together or lost, and the L&D unit would lose large amounts of materials every year - Jane estimated that the floor counted approximately \$50,000 worth of materials lost just within the 2015 year. One workaround that the L&D clinicians and nurses began was to keep a colored tag on all materials, such as to decrease the chances of the cleaning and inventory room at Stanford confusing their supplies with another medical unit's. Unfortunately, this is a workaround that cannot prevent all losses.

Additionally, the need to place all materials into a packet is incredibly inefficient, as once the packet is opened, all materials need to be disposed of or cleaned again. This means that Stanford ultimately recycles tons of supplies each year, donating them to other countries that will take them. While this is not a bad option, the need to dispose of an entire pack of materials simply because a nurse needed one or two items within the pack is ridiculous.

Another problem area involves the room cleaning and trash disposal within the L&D rooms. After each delivery, the room is cleaned by a cleaning staff, a necessary measure to ensure patient safety. Unfortunately, this has brought up problems in the past, as there is sometimes a lag in the time between exiting a room and cleaning the room,

meaning that there is a certain time of use that is wasted. Fortunately, Jane mentioned the hospital had invented a better solution: upon nearly finishing and exiting the room, nurses immediately call the front desk to call a housekeeper, who arrives and enters right after the patient exits. However, I strongly believe there can still be other ways of improving this process.

Lastly, the method of cleaning trash cans is one that appears necessary, but could potentially be improved. Jane showed us all the various trash cans that the physicians and nurses could dispose trash in, depending on what material it was. However, whether the can is filled or contains one or two items, each bag is emptied at the end of the patient visit. This appears to me to be a somewhat wasteful and confusing process, as the bags could even be mixed up anywhere between initial disposal and final cleaning.

## **2. Physician and nurse safety and health is another concern in the L&D environment.**

During our questioning, Jane mentioned numerous examples of incidents in which doctors' and nurses' health and safety have been damaged in working on the labor & delivery floor. For example, one fact she mentioned is that the L&D unit has the highest injury rate in all of Stanford, with nearly 35% of employees experiencing injuries.

One main concern is that there are often cords trailing on the floors that nurses or clinicians can trip on; these cords are often connected to the mother or child, or the patient bed and carts. This creates a hazardous environment in which small cords near the floor can go unnoticed. Jane mentioned that some solutions include the inclusion of cordless monitors or placement of cords behind the patient bed, though they aren't always preferred because of decreased accuracy or increased setup time. Additionally, Henry said that cords sometimes descended from the ceilings to prevent tripping, but these were also challenging to work with and plug in or unplug.

Another hazard to doctors and nurses was that the warm environment that mothers and babies often need can be overwhelming for clinicians and nurses - Jane mentioned that there were two faints within just the last week, in which operation rooms set at temperatures of 75 degrees Fahrenheit were too warm for people wearing layers of restricting and heavy scrubs and hospital gear.

Lastly, employee fatigue can also be another concern. Nurses often work for 12 hour shifts because of the convenience of working fewer days a week, though Henry said that research had shown that such long shifts can be detrimental to worker attentiveness and health. Jane mentioned a potential workaround: family members are now asked to help hold the mother's legs back during delivery, as it can become a tiring process for the people involved (additionally, Jules mentioned that this was incredibly painful for the mother as well).

These were all factors that I had not originally thought of, as I was so interested in focusing on the patients and ways of improving the environment for them, that I nearly forgot about the risks involved for the clinicians and nurses.

### **3. Sanitary communication is not currently possible or convenient**

One other issue is that objects within the room can easily be dirtied during the delivery process, which is oftentimes overlooked when there are greater priorities of patient safety. For example, while Jane was informing us about the phone system within the labor & delivery floor, she explained that doctors and nurses oftentimes risk dirtying their phones during delivery, as they may need to use their phone to communicate or contact other employees. Afterwards, they can sanitize their phone, but this measure is not always immediately taken. While the floor had tried improving communication during delivery by transferring to headsets that would not require hand interaction, this measure was ultimately abandoned, as people were not accustomed to this form of communication and found it difficult. Additionally, other items that may need to be touched during the delivery process, such as the computer mouse(s) and keyboard, can also be unsanitary. This is a very clear area of improvement, but can also be challenging due to the need to not introduce too much change as to be uncomfortable or drastic for the employees.

Ribhav Gupta:

Notes:

- Whiteboard used to write down patient information
  - Name, Room #, Comments, Procedures
- 4 Surgical Units/4 Inductions per day
- 10 labor rooms
- 4500 deliveries expected this year
- Aversion: rotate baby
  - Fear is that umbilical cord can rupture
- Disinfectant outside each room
- Computer cart take up lots of space
  - Maybe mount to wall of room
- LDR board (whiteboard) on wall
- Warmer & Cart are mobile so they can be brought to other rooms
- Warmer against wall
  - Renders one side unusable
- Other hospitals have bars on bed
  - Facilitates squatting or other poses for labor
- Try to have mother delivery in 1-2 hours
  - Usually always within 4 hours
- Can use induction if needed to catalyze birth process

- Based on Bishop Score
- Move mother to antepartum after birth
- Biohazard trashcan & regular trashcan & Linen Cart
  - Unappealing
  - Cleaned every day
- 12-17 delivery packets for OR at all times
  - Total of 30 packets for L&D
- Lots of packets lost during cleaning
  - Makeshift solution using labeling
- Use phone to call for help
  - Intercom in room but not set up
- Cleaning of C-Section Rooms is time consuming
  - Done by housekeeping
  - Delays ability to use room
  - Currently pre-emptively prep housekeeping
- EPIC: Computerized documentation for Stanford
- Neonatal Tray
  - Once opened, all items are disposed off
  - Pros:
    - Neonatologist knows what's in room
    - Don't have to leave room to get things
    - Easy itinerary
- Injury Rate
  - 35% for nurses
  - Should be capped at 5-6%
  - Mostly due to tripping over wires
  - Trying to use more wireless technology
- Fetal monitor has large paper strip but also uploaded online
  - Paper allows nurses to make notes/mark it quicker
  - 2-year lifespan of paper
- Computer Station
  - 2 computers
  - 2 mouses
  - 2 keyboards
  - must log in twice
  - All is a waste of time and confusing when using it
  - Should use touch screen
    - Already exists: General Electric QS
- Bed Design can be improved
  - Ex. Headboard prevents access at times
- Insights 2 Drills each week
  - Emergency Drills
- Skin to Skin

- OR Design to allow baby to always be with mom
- Used to have lots of stuff in room, made mobility limited
- Now room more centered around mom & child relation
  - Mom can see what doctors are doing to baby
- Lots of health benefits of keeping baby near mom
  - Calm and healthy
- OR needs to be cold for docs, but warm for babies
  - Difficult to find solution for this
- Physicians/nurses will soon use same network
  - Using ASCOM phones right now
  - Patients will be able to contact doctors
- Headset exists to call for help
  - Heard to change culture
- There are stations to clean phone
- In case of help
  - 1<sup>st</sup> call to lead nurses
  - 2<sup>nd</sup> call to nurses who don't have patients
- Whiteboard nice, allows doctors to write
  - TV nice, allows all to look at data

### 1. Wires

With a staff injury rate of 35% in the labor and delivery unit, there is an apparent need to make the rooms safer for nurses and doctors. The majority of these incidents occur due to doctors and nurses accidentally tripping over wires. All the devices attached to the mother must be wired to the central computer station. With already limited walking space, the wires laying across the floor serve as incredible hazards. While the hospital has attempted to move towards wireless monitoring, the current wireless medical devices has sometimes proven unreliable or glitch and therefore cannot always be relied upon. The injury rate needs to be brought down to at least 5-6% as is the accepted standard across the remainder of the Stanford Hospital.

### 2. Lots of Repetition

Many aspects of the system have a lot of repetition. One major source is documentation. For example, the fetal monitor is both recorded electronically and in print. There are benefits to both systems however at the end of the day, there is no reason to have both systems in place if we can compile them into one source. Furthermore, there exists a lot of repetition at the computer station, with duplicates of monitors, keyboards, mice, and even having to sign into each system separately. The repetition in this case can cause confusion and delays at important moments in the procedure. In general, there is a need to streamline the system more and remove redundancies which are only working to distract doctors and nurses from performing their jobs to the highest ability.

### 3. Wastage is apparent

Due to contamination concerns, many products are routinely wasted at the LPCH. A large contributor is the neonatal tray. Although the tray contains 20 items, even if only one is used, all others must be discarded. While the standardization of the trays ensures that neonatologists know what to expect when opening it, and it is easier to inventory, it can result in hundreds of thousands of dollars of wastage which could've otherwise been used elsewhere at the hospital. Another reason for wastage is due to the lack of communication between the labor and delivery center and the location where re-usable items are cleaned. Without communication, or even accountability, many times items will simply go missing due to poor documentation, or for any other reason. The nurses have devised a makeshift temporary solution, which can be enhanced.

#### 4. Mobility

The baby Warmers and mother's beds are made in a way such that they are mobile and can be brought to any part of the hospital. The concern is that with the amount of wires/cables/pipes attached to each unit, it can be very time consuming and confusing to bring them anywhere. There should be a way to make the transportation process easier and more efficient. Secondly, the room is not large enough to easily move the bed through the frame. Likely, it can be a process to get the items outside of the room and move them elsewhere. The room design can be improved create more floor space to make moving the bed easier for doctors and nurses.

Johanna O'Day:

#### Notes from LPCH visit

1) When you think about a hospital and all of the important services and procedures whirring about it is easy to forget about something as simple but vital as housekeeping. Keeping everything clean and orderly is a huge maintenance necessity and I loved seeing the nurses "work around" to get the housekeepers in faster and make clean-up more efficient. The 1-button housekeeping system present in the shared patient postpartum rooms is attractive for use in the OR and labor/delivery rooms. I know that it is currently hard because everyone is on a different communication system so it is better to call the front desk who will then summon the appropriate staff but I think eventually a 1 button system that almost works like Uber and summons the closest housekeeping staff member or else the one that is almost done (maybe it works by tracking location so if it takes a housekeeper 15 minutes to clean a room then when he/she arrives in the room the timer will start counting and then when a call comes in, it will take the closest housekeeper that will be available soonest).

2) I think a lot could be done to the post-partum rooms to make them friendlier and more comfortable for the patients and also the family/visitors. Even a little paint/decor would add to the ambience. They are nice, with modern fixtures which is more than what I was expecting but still room for improvement. I didn't get to see the shower but if there isn't a comfortable chair in it then that is certain a place for innovation. One mother recounted that she used the shower often after delivering because the warm water was soothing.

3) Seeing the EMR system in place was kind of shocking- the fact that they had to use 2

mouses/keyboards for 2 separate computers and that the screens weren't compatible, well that seems like a "quick fix." Also, the username/password system seems like an easy fix, I'm sure hospitals have developed fingerprinting log-in systems or keycard scanners (as Jane mentioned) but I would think it wouldn't be hard to even just have a four digit login code, almost like an iphone keycode? Perhaps not enough security in that? Anyway, I think there is a lot of improvement as far as hardware and software goes in these wards.

Albert Ho:

1. **Integration of information technology in the delivery room.** The user interface of the main EHR provider EPIC that SHC is using doesn't quite fit the meaningful use of electronic health record: to improve quality, safety and efficiency of health care and ultimately help robust research data on health systems if the nurses have to manually input the fetal heart rate monitor strip data. White board with colored magnets may be a simple and reliable way to indicate the latest available resources, but only people who are physically at the station can access its information.
2. **Regularly practiced drills.** I am impressed by the efforts of continuous improvement the labor and delivery team is making. The on site drills not only make the multidisciplinary team cooperate better in the Lucile Packard Children's hospital but have more profound influence to other institutions by quantitatively measuring the median time from recognition of emergency in a labor room to an operating room and make first surgical incision at about 9.5 minutes and publishing it. (*Journal of Perinatology* **33**, 259-263 (April 2013)).
3. **The recycling of medical devices.** Those unused sterilized trays are donated to developing countries. This reminds me that unlike consumer products, medical devices have to be approved by FDA for their efficacy and manufacturing processes before they can be sold. It will be a huge waste if some of them go directly to the landfill unused.

Karthik:

1. Workplace accidents are common in the delivery room due to nurses tripping on wires and cords that link to monitoring devices (e.g. electronic fetal monitor). This part of the delivery room is often the most unsafe space. While, hospitals have tried to work on wireless devices they find that the readings are not as accurate or consistent as the hardwired devices.
2. At LPCH there are three operating rooms, however only two are in use at any time due to the 15-20 minute turnover required for house keeping to clean out the rooms. While this process has been made more efficient, rooms are still not used efficiently.
3. Nurses and physicians communicate through ASCOM phones. However, these phones are not entirely sanitary due to patient interspersed phone and patient interactions. Even though there are headsets that work with these phones, they are not utilized due to established workplace culture.



Ana:

- Work-arounds are especially prevalent when it comes to sterile tools, including labelling, using disposable alternatives.
- The LPCH L&D experience could use more ways to accommodate and prioritize the comfort of the mothers, including a possible maternity cooling pack, squatting bars.
- Skin-to-skin has proven to be very beneficial to both baby and mother, finding ways to facilitate that essential. But there's the problem of space and limited number of equipment (Panda warmers, natal resuscitation trays).

Hadley:

1. Headsets for the Ascomm phones exist but have not been adopted by hospital staff.

The Labor and Delivery ward bought headsets to go along with the Ascomm phones which are used to communicate to staff during labor in delivery (instead of the non-functioning intercoms installed in the rooms). However despite having this technology readily available and stocked the headsets have not been adopted. It would be interesting to learn more about the reasons for this: are they uncomfortable? Do they restrict being able to hear other important sounds in the L&D room? Or is there simply workplace inertia to adopting new technologies?

2. Knowing that rooms are fully equipped before a patient enters is one of the top priorities of a team in L&D.

Many of the inefficiencies in cleaning, stocking and disposal of instruments used in labor and delivery seem to stem from an overarching desire to package things in such a way as to ensure complete kits/cabinets are never a concern for clinical teams during delivery. This could be leveraged in the adoption of new techniques/technologies if they fell into this category of pre-packaged preparedness, but it also serves as a limitation in separating out tools and streamlining the process for greater efficiency and fewer wasted/lost tools.

3. Privacy is a large concern during labor and delivery, but is not

always maintained.

Communal recovery and preparation rooms can be stressful to mothers. The journey between rooms and wards also seems to be a time when mothers are exposed in a way that may make them uncomfortable. Curtains provide some amount of visual privacy, but do not restrict sound carrying between beds in a communal ward.