Strengths

- **Delivery room:** Preparation for delivery room and operating room resuscitation has improved substantially with the equipped resuscitation box.
- **Respiratory management:** Generally, very good for both neonates and older children. This seems to be a major area of strength for Chenla Children's with regard to both CPAP and ventilator management. Surfactant is an exciting opportunity that your team seems well-positioned to strategically employ.
- **Phototherapy**: All units except one high quality. Team plans to change the bulbs on the subtherapeutic firefly, which is a positive indication of the supply chain.
- **Nursing:** Care is excellent, and nurses and doctors work very well together. Nurses recognized neonates with abnormal vital signs and notified doctors appropriately. Nurses very good at getting IV access in both neonates and children.
- **Physicians:** Senior doctors with a very strong fund of knowledge and grasp of physiology.
- **Equipment**: IV pumps, continuous heart rate and pulse oximetry available for every sick neonate and child.
- **Infection control:** Hand sanitation before each patient encounter seems to be routine. Hand sanitizer readily available for every patient.

Areas for opportunity

Equipment suggestions (prioritized order)

- Breast pumps (if possible, a limited number of electric pumps for those that are having extreme trouble getting EBM but good hand breast pumps for mothers of all premature and sick neonates).
- POC CRP machine: In the case of two low CRP's 24 hours apart, strongly consider stopping antibiotics unless clear indication to continue.
- Dexmedetomidine: If available and affordable, consider purchasing for use in sedation protocol.
- Levitiracem (Keppra): If available and affordable, consider using as first line after phenobarbital for seizure control in older infants and children. Would continue to use phenobarbital for first line for neonates.
- Infant scale: Current scale is only accurate to 50g but recommend digital scale that is accurate to 5-10g. (Sounds like the previous digital scale is broken.)
- Additional blood pressure cuffs in neonate, infant and child sizes if possible. Often staff only had really big cuffs available.

Policies/guideline suggestions

- **Kangaroo Mother Care:** TOP PRIORITY. If we could only institute one suggestion, it would be routine KMC. KMC decreases mortality, improves thermoregulation, improves breastfeeding, decreases infection, improves bonding, etc. It is also the global standard that is strongly

recommended by the WHO for the care of low-birthweight/preterm neonates – they recommend KMC for 8-24 hours per day. We recommend sending a nurse leader to receive KMC training, so that there can be an advocate within the local leadership team. Though the entire team is important for success, often KMC is functionally nursing-led at the bedside.

- **Feeding of sick and preterm infants**
    - Increased structures in place to encourage increased breastmilk use such as:
        - More consistent lactation counseling for mothers of sick and premature infants that breast milk is best and the only "medicine" that they can supply.
        - Lactation training for all neonatal nurses and nurses taking care of babies IPD and the NICU/PICU.
        - Encourage complete emptying of breasts and pumping at least every 2-3 hours until milk comes in.
        - Discourage formula use, particularly for preterm, except in unusual circumstances.
    - **Feeding advance:** Current policy is much slower than WHO guidelines for advancement of feeding (intended primarily for neonates using Expressed Breast Milk). Slow feeding advances are associated with worsened outcomes but do not decrease the risk of NEC. In small neonates when using breast milk, advance feeds by approximately 30 ml/kg/day once mother has enough breastmilk.
    - **Hindmilk**: Consider use in neonates on full feeds especially if the neonate is on more than 180/mL/kg/day and NOT gaining weight and mother able to express more milk than her baby needs. Can do by simply having the mother express 5-10cc of EBM into one bottle and then pumping into a second bottle which will have a higher creamatocrits or fat content and thus a higher caloric content. Give EBM from this second bottle to the baby.
    - **Growth charts:** Plot growth of premature neonates on Premature Growth Charts weekly (could use Intergrowth charts or any premature infant chart). For infants with very poor growth, consider increasing feeding volume and/or fortifying maternal milk with formula to 24kcal/oz.

- **Antibiotic stewardship:** Given prevalence of Meropenem over-use could consider requiring senior doctor approval before using.

- **Phototherapy:** When using phototherapy expose as much of the neonate as possible. Roll down the diaper as far as you can. In female neonates with very high bilirubin levels nearing exchange transfusion or neonate with any signs of acute bilirubin encephalopathy put the diaper under the neonate and in male infants make the diaper as small as possible. Suggest checking total serum bilirubin and TCB simultaneously on 50-100 samples and see how well they correlate and whether your TCB reads correctly or generally too high or too low.

- **Trauma:** Consider using hypertonic saline and limiting use of mannitol in traumatic brain injuries with evidence of increased intracranial pressure.

Overall, we were extremely impressed by the quality of care that is provided by Chenla Children's Hospital. The wards are clean, the equipment is well-maintained, and the personnel are well-trained and intellectually curious. The care provided is excellent and compassionate. We are confident that many lives have been saved due to the improvements in the quality of care by government hospitals that have partnered with Chenla Children's Healthcare.