Welcome to the Newborn team!!

It is an amazing time to interact with families as they welcome these new babies into their lives.

The Newborn service is different than most places in the hospital in that the assumption is that the babies are “normal.” However, always be mindful and respectful of the fact that this may not be the case. Every piece of information is important and may be the only clue that something is wrong. It is our job to identify babies who are not well or who may be at risk.

We take care of a relatively high risk population of infants and newborns can be unpredictable, so as a result, we have a multitude of “checky-boxes” that all must be completed for every baby. This is consistent with the WHO Birth Safety checklists or Atul Gawande’s Checklist Manifesto.

Below are some guidelines and pearls that we hope will help you feel settled more quickly so that you may learn and enjoy the rotation in a supportive and low-stress environment!

If you have suggestions for this Orientation Handout or for the rotation in general, please let the Medical Director, Dr. Kellams, know so that others may benefit from your experience.

Thank you for reading this over carefully and for asking any questions that you may have about the information presented.
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I. The Basics

Dress

1. White coats are optional. Gray scrubs are required to go into the Operating Rooms.
2. You must have bare forearms when examining infants and wash/sanitize up to your elbows between babies.
3. If you wear a white coat, the sleeves must be rolled up.
4. If you are going to hold or feed a baby up against you, you should put on one of the gowns located in the cabinet above the sink, or cover your torso with a blanket.
5. Medical Students – Please put backpacks and coats in the room with the lockers that is available on the 7th floor.

Infection Control

1. You must wash/sanitize your hands before and after EVERY patient contact.
2. First thing upon arrival, scrub with the chlorhexidine soap at the sinks. After that, the hand sanitizer will suffice before and after each baby.
3. Alcohol or sanitize your equipment (i.e. stethoscope and ophthalmoscope) after each use.
4. If you are coughing or have rhinorrhea, wear a mask at all times while in the newborn obs room or patient rooms. If you are febrile or achy, have nausea or vomiting, or some other extremely contagious illness, please notify the attending.

Daily Routine

Attendings will try to arrive by 7:15 AM. Before Morning Report, residents should touch base with the Attendings about the discharges and make sure the discharge orders are in by 9:00 AM for those who are medically cleared. If for some reason the patient is not medically cleared, and cannot have the final order, then notify the patient’s nurse as to the hold up.

The newborn resident should touch base with the Charge Nurse between 7:30 and 8:00 AM daily to arrange to be paged for scheduled C-sections and to get the “lay of the land” of the unit(s) for the day.

Rounds begin promptly at 8:30 AM in the Newborn Obs Room, every day except Thursdays when they begin at 9:00 AM after Grand Rounds. You should examine your patients, gather all necessary information, talk to the nursing staff before rounds and be prepared to present your patients. Rounds will include going to see each baby and family together as well as informal teaching based on the cases presented. Time allowing, there may also be a more formal teaching session immediately after rounds.

Information is presented on rounds as it appears in the notes. If there are new members of the team or if the baby is new to rounds, then do a complete presentation using the rounding sheets. If the baby has already been discussed on rounds, it is ok to give a summary and then go to the information from the past 24 hours.

Medical students should try to formulate their own plan for the day for their patients and report this on rounds.

Looking up topics of interest on patients and presenting a 60-second blurb on a topic is encouraged.
At least 1 resident and 1 medical student should stay until sign-out at 4:00 PM. Up to two students are allowed to attend deliveries. Down-time should be used for reading, Clipp cases, and reviewing the newborn intranet site at http://www.healthsystem.virginia.edu/pub/newborn-nursery.

Residents are expected to attend Pediatric Morning Report at 8:00 AM every day, and Grand Rounds on Thursday mornings. Medical Students should attend Grand Rounds but should not attend morning report due to space issues.

Medical Students should plan to follow about two patients each day, but are welcome to help the residents with more. Students will be asked by the Attending to review an article from the current literature regarding a pertinent topic in newborn medicine. The presentation should be very brief (5 minutes) and will occur on Thursday or Friday of the rotation (this may be attending-dependent).

Residents will be administered a Newborn pre-test and a Newborn self-assessment in week 1-2, to assess their progress and to identify areas to focus on for the remainder of the time.

**The Attending should be notified of all admissions before 4:00 PM, and any NON-routine admissions (see Newborn Admission Guidelines), respiratory distress, hypoglycemia, unanticipated need for phototherapy, mom Hepatitis B+, GBS+ not treated, maternal chorio or fever, any transfers of babies to or from the NBN, or other changes in clinical status, or any questions – day or night.**

Residents should provide both the NBN nurses AND the NICU team with a copy of the sign-out sheet every day at 4:00 PM, and review the pertinent issues verbally.

**Weekends**

Rounds will begin at 8:30 AM and it is expected that all information will be gathered and all babies examined before rounds, just as on a weekday. Allow time to admit up to 4-5 new babies per day before rounds.

**Charting**

The admission, daily, and discharge notes in the chart should be filled out by the resident and signed off by the Attending.

**Sign-out**

Medical students should sign-out with the resident before leaving at 4:00 PM. A copy of the sign-out should be given to the NBN nurses as well as the NICU team.

**Nurse Practitioners**

We are very fortunate to have two family nurse practitioners, Mary Jane Jackson and Sarah Sutton, and they will be a huge resource to you.

NPs will attend rounds every day from 8:30 until ~11:00 AM unless away or at a meeting.

On days when there is one pediatric intern (and one of them is here; see schedule posted above the computers in the nursery), one NP will cover half of the census if there are more than 7 babies. On days when there are two interns, one NP will cover the census if there are more than 14 babies. This includes pre-rounding and presenting on the patients the NP is covering and being responsible for updating the sign-out sheet.

The NPs are NRP certified and can carry the delivery pager in the intern’s absence.
It is the resident's responsibility to let the NPs know their clinic schedule (so the NP can arrange to cover the Newborn Nursery in the afternoon) and to sign-out to the NP before leaving for clinic.

**Deliveries**

Please visit the ORs and a Delivery Room prior to being called to a delivery, to familiarize yourself with the equipment and its use. Either a senior resident or one of the L&D nurses can show you around.

The newborn interns should take turns going to deliveries with the delivery response team. Up to 2 medical students can go to deliveries at a time. Decide in advance who will be up front and who will be observing.

For normal deliveries, pediatric presence is not required; however, the residents should arrange to be called by the shift manager for scheduled C-sections, to maximize delivery room experience and to observe normal infant transitioning. If assistance or resuscitation is needed, the delivery team should be called.

This SHOULD NOT mean that all of these babies need to be resuscitated and put under the warmer and removed from their mothers. Rather, unless medically necessary for the baby or the mom, any initial assessment should be done with baby on the mother's chest for normal deliveries.

For moms who have indicated breastfeeding, please encourage her and the nursing staff to keep the baby with mom and to try to get the baby on the breast within the first hour of age, even for C-sections.

**Emergencies**

Please refer to the Admission Guidelines in the book at the nurses’ desk for reasons to call the NBN attending, and feel free to call for any and all questions at any time.

You can always call down to the NICU for non-emergent questions: 4-2335.

There is a NERT (Newborn Emergency Response Team), which is basically the NICU team and the NICU charge nurse, for times when you need an urgent hand and do not have time to page, be placed on hold, etc for acute status changes in babies that are not codes, but have potential to become codes.

Neonatal Code 12 is available by dialing 2-2012 as for other codes throughout the hospital. Be sure to say "newborn" or "neonatal" (i.e. not pediatric) so you will get the NERT team emergently. This includes an overhead page.

Perinatal codes are very different and are reserved for emergent delivery situations involving mother and baby (i.e. not just baby) and will get the NICU team plus OB, anesthesia, OR, etc.

**Recommended Experiences**

**While on the Newborn rotation, try to:**

- Attend a C-section
- Attend a vaginal delivery
- Observe/practice neonatal resuscitation
- Encourage/support breastfeeding
- Observe a lactation consultant
- Observe a social work evaluation
- Observe and participate in the Dubowitz/Ballard exam
- Assign an Apgar score
- Master newborn discharge teaching
- Use the downtime for the required reading and preparation of your presentation
- Teach yourself, colleagues, students, staff about issues in newborn medicine
- Observe a circumcision from the baby/nursing perspective
- Keep your eyes and ears and heart open to the awe and wonder and excitement that is right before your eyes!

GME Milestones Emphasized in Newborn Rotation

1. **Gather essential and accurate information about the patient**—For newborns, this means a thorough review of the prenatal record/mother’s chart whether electronic, paper, or both.

2. **Organize and prioritize responsibilities to provide patient care that is safe, effective, and efficient**—For newborns this means recognizing sick vs. not sick, red flags in the prenatal record, and learning to supervise medical students; it also means streamlining discharges and ensuring discharge prepping the day before.

3. **Provide transfer of care that ensures seamless transitions**—For newborns, this means excellent communication with OB, nursing, night team, NICU, and infant’s PCP.

4. **Coordinate patient care within the health care system relevant to their clinical specialty**—For newborns, this means starting the newborn’s medical record with family history and birth history and ensuring adequate documentation of prenatal history and hospital course.

5. **Work in inter-professional teams to enhance patient safety and improve patient care quality**—For newborns this means keeping the sign-out and orders up-to-date and coordinating with nursing, NICU, OB, lactation, social work, any consultants, and the infant’s PCP.

6. **Identify strengths, deficiencies, and limits in one’s knowledge and expertise**—For newborn rotation, the only rotation in first-year without a senior resident, the residents must know when to ask questions, call the attending, double-check information, and supervise the medical students.

7. **Humanism, compassion, integrity, and respect for others; based on the characteristics of an empathetic practitioner**—For newborns, this is an incredibly important, formative time for families, everything we do and say as providers must reflect the importance of the situation and be sensitive to the family’s perspective.

8. **Trustworthiness that makes colleagues feel secure when one is responsible for the care of patients**—for newborn rotation, again, there is no senior resident, so it falls upon the newborn resident to assimilate all information on their patients and communicate it to team members.

9. **The capacity to accept that ambiguity is part of clinical medicine and to recognize the need for and to utilize appropriate resources in dealing with uncertainty**—For newborns, the assumption is that all is well, but it is our job to figure out who is not well or who is at risk of not being well. There are many protocols and guidelines designed to ensure safety for this population, but clinical judgment must always be applied to any given situation; when in doubt, we should seek more information or help and err on the side of caution

10. **Communicate effectively with patients, families, and the public, as appropriate, across a broad range of socioeconomic and cultural backgrounds**—For newborns, we see a huge racial, economic, and educational diversity and are charged with ensuring that all parents/families leave the hospital knowing how to safely care for their babies.
II. Admissions & Discharges

Admissions

For all babies, at minimum, we **MUST KNOW** the mom’s Hep B status, RPR Status, HIV status, GBS status, how long they were ruptured prior to delivery (>18 hr is prolonged), and Blood type as soon as possible, because these can all change our direct management of the baby.

On each admission: Use the Admission Questions and Teaching Sheet to make sure all of the appropriate information is obtained and education provided for each family.

All babies should have their mother’s charts reviewed in Epic. This includes the OB History and Physical, the “Pregnancy” tab including visit notes at the bottom, the ultrasound reports found under the “Media” tab, and any paper or scanned outside records – also found under the “Media” tab.

Use the Newborn Admission Order set to admit the baby in Epic.

If the baby is a preemie (<37 weeks by dates or by Ballard), the infant should be considered a “Preemie” or “Late Pre-term infant”. Have the parents bring in the car seat **before the date of discharge** for the car seat trial, and alert the nursing staff, and warn the parents that sometimes babies born early have to stay longer in the hospital.

If there are transportation or complex psychosocial issues that may interfere with discharge, make sure the Social Worker is involved early in the hospital stay.

If either EGA or Ballard is <37 weeks, whether the baby is Large, Appropriate, or Small for Gestational Age (LGA, AGA, SGA) is determined by plotting the WEIGHT of the baby on the curves on the back of the Ballard flowsheet. The resident and students are responsible for doing this (it is good to state and report where the L and HC as well).

SGA, LGA, and preemie, and infants of diabetic mothers, automatically needs sugars and hemoglobins checked after birth (see Hypoglycemia protocol).

Encourage mothers and babies to be **skin-to-skin** as much as possible. This helps the babies to thermoregulate and encourages frequent breastfeeding. Also, we practice “rooming in” so mother and baby are cared for in their room.

Discharges

We are supposed to have orders in by **9:00 AM** for babies who are **being discharged** (babies are supposed to leave before 12:00 Noon). To make this possible, here are a few guidelines to follow for every baby:

- We will always round first on babies going home that day, so final discharge orders may be put in during rounds (or, ideally, before rounds, if ok’d by Attending) – before 9:00 AM!
- If orders are not in by 9:00 AM for a medical reason, let the nurses know why.
- Be sure any consultants involved in the care know about the baby early-on and when the baby is supposed to go home.
- If ordering a Cardiology consult, also order a pulse-ox check, four extremity BPs, and an EKG.
- Be sure the ABR (hearing test) has been done!
- All babies have their heels poked to obtain blood for the **State Newborn Screen**. This must be done **after 24 hours of age**, otherwise it would need to be repeated. Therefore, we **do not** routinely discharge babies home before they are 24 hours old.
- Be sure all items on the Discharge Checklist in the problem list are complete.
**Discharge Appointments**

All babies, unless they are more than 72 hours old and/or are at least 48 hours old with no risk factors, require a hospital follow-up visit with their PCP within 1-2 days after going home. Ask the HUCs to make this appointment the afternoon before the discharge.

The baby should be seen within 1 day after discharge if a preemie, or jaundiced, or has close to 10% weight loss, or complex psychosocial situation, etc. This can be tricky over the weekends and holidays; discuss options with the Attending or NP.

Often, if you call the PCP yourself, you can make arrangements for the baby to be seen even if the PCP does not have a formal clinic. Any baby who has had a complicated medical course deserves a phone call to the PCP to give them a heads-up.

UVA Northridge has Saturday and Sunday clinic. UVA Orange has a Saturday clinic. Battle Building patients are seen at Northridge.

The other option is to do a weight/bili check on the 8th floor for non-UVA patients. Have the parents go to the OB Check-in at the East HUC station at 7:45 AM. Notify the HUCs and Lactation Consultants about the babies who will be coming in the next day. They will page you when the family arrives so you can examine the baby. RNs will do the weighing and any transcutaneous or serum bili needed, and Lactation will see the dyad if breastfeeding and will start the note.

There is a list of Referral Doctors in the Newborn Procedure Room, and Social Work is a good resource for lining up PCPs.

**When Mom is being discharged but baby is not ready**

We try NOT to separate moms and babies, particularly those who are breastfeeding. If mom is ready for discharge but baby needs to stay, these are things to try (in this order): Talk to OBs to see if they have a reason to keep mom an extra day (allowed 48 hrs after SVD, 72 hrs after C/S); or talk to the charge nurse to see if mom can “board” in her room – this is the solution most often.

### III. Charting & Sign-Out

**Documentation (Epic tips)**

- **Signing into EPIC**
  Be sure when you sign into EPIC that you choose the “UVHE NEWBORN NURSERY” environment to have access to all of the tools and screens.

- **Sign-Out**
  Residents or NPs are responsible for printing signout sheets for themselves and the attending in the am. Each patient should have a “refreshed” “.problcom” in the text section of their signout sheet.

  **NOTE:** It is nice to change the font to 8 on these, if you have time, so printing does not take up as much space/paper.

- **Pre-Rounding**
  The resident is responsible for pre-rounding on at least 7 patients each day. (If there are more than 7 patients, the NP will see the remainder. If there are more than 14, the census will be split equally.)
Pre-rounding should include gathering all information including prenatal information on new patients, reviewing the order set, updating the problem list to the best of their ability, and beginning and “pending” the note. Babies can be examined with the team on rounds unless there is a clinical concern, and families do not need to be awakened or babies removed from the breast prior to rounding as a team. Families appreciate fewer interruptions.

- **NBN Order Sets**
  
  Search "neo" and choose “newborn admission”.
  
  Need to check the box for Hep B.
  
  Nurses should initiate the admission orders and give the shot within 8 hours of birth.
  
  “Eyes, Thighs, Delivery Summary completed, and Hep B”.
  
  For late pre-term infants or infants that you are worried about:
  
  Use the NICU order set and tailor for that baby, and/or add additional orders to the NBN order set--think about things like frequency of vital signs or pulse ox checks, or minimum feeding orders in particular.

- **Labs**
  
  For labs, we have asked that the "normal" for NBN be "unit collect", but please check each time until this is the default. If you need a venous stick, enter it as such and let the baby’s nurse know as well.
  
  For routine labs, please use the following schedule: 0600, 1400, 2200 as much as possible, even if it means labs are 7 instead of 8 hours, or 13 instead of 12, etc.

- **PCP Appointment**
  
  Please still ask on the first meeting with the patient (nurses and HUCs are to be asking prior to delivery!) to make sure not UVA FM pt. For now, the PCP appointment request is a misc type-in order, HUCs should be making the appointments as requested and entering the dates/times in the discharge instructions.

- **Viewing Mom and Delivery Information**
  
  Click on the blue "admission" activity tab on the far left in baby’s chart.
  
  At the very top, click to expand "maternal data"--then a whole bunch of mom info will populate.
  
  Scroll down near the end to "delivery summary" which will give you the apgars, any resus (if really a code, this will still be recorded on paper), and also time of rupture.
  
  Click on “beginning” or “end of maternal data” to enter mom’s chart.
  
  In UVA index view tool bar, wrench in “pregnancy view” for a lot of information, or click on mom’s “Admission tab to scroll through ACOG information and to view her admission H and P-- you should scroll through her pregnancy progress notes for issues and to see if she saw MFM for complications, etc.
  
  Ultrasounds are found under mom’s “Chart Review” and clicking on “media”.
  
  If can’t find something, ask the OBs.
  
  Also, if some of her care was not at a UVA site, they are keeping hard copy prenatal records in a drawer at the 8 central HUC desk for the moms.

- **NBN Vitals and I/Os**
  
  Go down to the bottom of the blue activities tabs on the far left and click "More Activities" and then click on "View doc flow sheet". Then you can choose "nbn vitals" "ballard" "newborn I/Os" and see what you need to see.

- **Growth Charts - AGA/LGA/SGA**
  
  Go down to the bottom of the blue activities tabs on the far left and click "More Activities" and then click on “Growth Chart”, unclick the “patient filter” box, and scroll down to “Prem Infant Fenton” and then click on the tabs for weight, length, HC.
Note, these use the estimated dates from the pregnancy, so if there is a discrepancy between that and Ballard, make sure you visually check both, if one of them makes the baby SGA or LGA, the baby should be treated accordingly. 

RNs should be putting this information in the comments section of the Ballard flow sheet.

**Charting / “Problem List”**

Keep this up-to-date as your main source for documenting daily assessment and plans for your baby. Doing so is *extremely valuable* for not only your daily note, but also for the sign-out sheet, and for billing. It also appears in the discharge instructions for the patient, to serve as a back-up method of communication with the PCP and gets placed in the “Birth History” section in the “History” section of EPIC.

Anyone should be able to look at the problem list and, at a glance, be able to determine anything and everything about that baby that is different than the usual.

On every patient, pull up the problem list, make sure you agree, use the "overview" section for each problem to enter your comments and current thinking/plan, and add any problems that you need to, and then hit "mark as reviewed."

The first problem for every baby should be: “Single or twin liveborn delivered in/out of hospital by (or not) cesarean”

**NOTE:** It is helpful to click on “detail” and change the way it is displayed to say “SVD” or “C/S” and include the reason, ex. “SVD, induced for preeclampsia”.

**NOTE:** label this problem as a “high priority” so that it will appear first in all of the different places in EPIC.

In the “overview” section under this first problem, type in: “.Birthsent” to bring in the standard signout template information and the discharge planning checklist, this should be updated daily as should the problem list.

For any random things related to mom, if you can’t find them when you search: use "maternal condition affecting fetus or newborn" and type the details in the comments.

On rounds, while one person is presenting, another person can be updating the problem list with the information and plan for that day while the attending is listening, and in real time reviewing the vitals, I/O’s, and daily note for the baby.

The PCPs in the UVA sites will then view the hospital problem list in the clinic and “resolve” the appropriate ones that are no longer an issue.

**Assessment and Plan**

If you go back and add a problem or an update, do so in the problem list so it is saved, and then just hit the symbol for “refresh” at the top of your note, and the updated version will pull in.

**NOTE:** You do not have to close up your note to update the problem list.

**Feeding/Reason for Formula Given**

For the Joint Commission, the reason for any formula used must be recorded whether mom is breast or bottle feeding. We thought the nurses could capture this, but for The Joint Commission, they can only collect the information that the LIP records. So, there is a drop-down menu in daily and discharge notes: "no formula given, exclusive bfing" OR: "formula given, mom's choice, no medical indication, after education, etc" OR "formula given medical indication (either bfing contraindicated and state why, or maternal or infant indication, and state why)."
**Hep B – where to find if it has been given**

“UVA index” view in “patient summary”, click on “medication history” for baby and view whether or not it has been given and the date, it will appear in green if already given—supposed to be done soon after birth.

**NBN Note Templates**

To find the NBN note templates: go to "Notes" in the blue activities bar at the left, (i.e. not the "notewriter") and click on "new note" then, in the smart text space toward the top, type "nbn" and hit enter, then choose from the list either the “NBN HandP” or the “NBN Basic” (which is the daily and/or discharge note).

Much information in these notes autopopulates if it has all been entered in the correct places, but please double-check each day that the information is there as this is the only documentation that the outside PCP’s will be receiving.

Residents/NPs should be starting the notes (and “pending them”), and updating the problem lists, and then the attending should be editing and co-signing (trying to do this on rounds.) NOTE: For the NP’s, leave the physical exam section blank as this needs to be completed by the attending, but note as you are presenting what you found.

At the bottom of every note that you are co-signing for the resident (i.e. not an NP), you should type ".att" and hit enter to add the attestation that you have reviewed the history and seen the patient, talked with family. If it was started by an NP, the attending will be the owner of the note.

**Med Student/NP Notes**

For med students and/or NPs, they can edit the "problem list section" on the blue tabs and start the note and complete everything BUT the PE section, and "pend" it, the attending will then complete the PE section, and bring in the updated problem list by refreshing, and no attestation should be included for this note.

For medical students, they should be writing a daily note and “pending” it, and the attending should be reviewing this note while the student presents and giving them feedback in real time. They should not use ".problcom" but rather should be creating their own assessment and plan section for practice. Once the note has been reviewed and feedback given, then the note can be “deleted” (but note, still is visible in the system).

**Editing Note Templates**

If you do not like something that appears in green in the note templates, you can highlight it, right click on it, and choose “make text editable” to change it.

**Charging**

For charging, go to "charge capture" and then click on "newborn" at bottom of the list, pick your code, then click on "full detail" at the bottom of that box and use the arrows to make sure the problems are checked that you want to include and are in the right order that they should appear.

Also make sure for the modifier to type "gc" to indicate that it was a clinical teaching patient.

You only have to type in the number of minutes if you are "upcoding" because it was a more complicated newborn.

When done with charges, scroll all the way to bottom left and hit "close".

If you need to change a charge, you can click on it and hit "full detail" to change the date or order of problems. If you need to change the charge itself, hit "review charges" and then click the ‘X’ at the far right of it to delete that charge and start over.
- **Hearing Screen Info** – Still on paper, in the yellow chart.
- **Consent forms** – Still on paper, also yellow charts.
- **Biliblankets or Breast Pumps for Home**
  If there is a medical need, notify SW as soon as possible.
  Go into the “discharge” tab, and then “order reconciliation” and then “new orders for discharge” and “place new orders” and then “DME other” and type in “bili blanket” or “dual electric hospital-grade breast pump” and include the reason for need and/or the patient’s most recent bilirubin level.
- **Concerns?**
  EPIC is still a work in progress, and we appreciate everyone’s understanding as we try to address the issues and as the dust is settling regarding what information will live where in the system. We definitely want to hear your feedback about things that are working and not working, but PLEASE NOTE that ALL concerns need to be directed to Dr. Kellams either in person or via email. No changes are to be made to the templates without her prior approval.

**Sign-Out**
Med students should sign out with the resident or NP prior to leaving at 4:00 PM.

The Resident or NP should page the NBN attending at ~ 3:00 PM to sign out prior to signing out to the NICU team. A copy of the sign-out should be given to the NBN nurses as well as the NICU team.

The sign-out sheet should be printed from the Epic patient list as instructed.

**IV. Care Guidelines**

**Non-English Speaking Patients**
Try first to get an interpreter. If not available, use the cyracom phone; **when using, try to maintain eye contact with the patient. Always document in the chart that you used the cyracom or an interpreter.**

**Resources**
In the cabinets above the physician workstation are a number of newborn and pediatric textbooks and handbooks that should serve as a starting place for information, and a baby HIP(py) model for "clunks".

The Newborn intranet site on Knowledgelink > Departments and Services > Newborn Nursery is kept up-to-date with current articles and links to practice guidelines. Site link is: [http://www.healthsystem.virginia.edu/pub/newborn-nursery](http://www.healthsystem.virginia.edu/pub/newborn-nursery).

The protocols for Hyperbilirubinemia, Hypoglycemia, Anemia, etc are posted on the board behind the computers, and in the white folder at the nurses’ desk.

Pager Numbers and extensions commonly needed are posted on the board in the Newborn Observation Room.

**Pearls**
**Blood Types:** Baby’s blood type will be checked on the cord blood if there is a potential for a "set-up" (i.e. if mom is O or if mom is Rh negative.) The baby's blood type will be listed under mom's name "cord blood" in the computer.
G=gravida (number of pregnancies, including this one)
P=parity (number of live births, including this one). Sometimes further broken down into TPAL Term, Preterm, Abortions (specify SAB or TAB), and Living children

EGA=Estimated Gestational Age (by dates); most accurate is by a sure LMP or by a first trimester U/S Ballard Exam for physical maturity. Performed by the nurses at about 2 hours of age on all new babies (watch them do one of these!); should be within 1-2 weeks of EGA or needs to be repeated.

SVD=Spontaneous Vaginal Delivery
NSVD=Normal Spontaneous Vaginal Delivery – loosely used to refer to all vaginal deliveries, even those that were induced, etc. If induced, need to state reason why, and if delivery was vacuum or forceps-assisted.
“Single liveborn vaginal” entered on problem list for these.

C/S=c-section, need to state reason why.
“Single liveborn caesarean” entered on problem list, change “Display” section to also indicate reason

RR=Red Reflex. All babies should have this documented in their chart.

All babies receive vitamin K shots to prevent hemorrhagic disease of the newborn or “Vitamin K deficient bleeding” and erythromycin eye ointment to prevent gonococcal conjunctivitis.

The Newborn Screen checks for inborn errors of metabolism like galactosemia and PKU as well as CF mutations, and Hb electrophoresis for sickle cell anemia.

Only Nurses and PCAs are allowed to transport babies to and from mom's room and NBN! MDs and Medical Students are NOT ALLOWED to transport babies!

CBC plus differential (with band count):
Need to calculate immature to total (i:t) ratio for neutrophils (take % Bands + myelocytes and metamyelocytes divided by % Neutrophils plus % Bands + myelocytes and metamyelocytes). Anything >0.2 is considered worrisome for infection (but do not rely just on one CBC, needs clinical correlation).

**Bilirubin**

All babies will have a bilirubin level checked prior to discharge. If there have been no issues, this can be a transcutaneous bilir or TCB. If the level is high-intermediate or high risk, or if it is above 12, a serum bili will be run automatically.

All bilis should be plotted according to the baby's age in hours (Batani curve), and reported on rounds as such, stating which risk category the level is for that age. Note: this curve is for healthy term babies only.

Special care should be taken in the case of an ABO or RH set-up or in a baby less than 36 weeks gestation or with other risk factors. The Phototherapy Guidelines curve should also be plotted based on the risk factors for the baby. The "light level" according to this curve should also be reported on rounds, and whether the baby is close or not.

Babies with major risk factors should have a transcutaneous bili checked at 12 hours of age (see Jaundice protocol).
Fig 2. Nomogram for designation of risk in 2840 well newborns at 36 or more weeks' gestational age with birth weight of 2000 g or more or 35 or more weeks' gestational age and birth weight of 2500 g or more based on the hour-specific serum bilirubin values. The serum bilirubin level was obtained before discharge, and the zone in which the value fell predicted the likelihood of a subsequent bilirubin level exceeding the 95th percentile (high-risk zone) as shown in Appendix 1, Table 4. Used with permission from Bhutani et al. See Appendix 1 for additional information about this nomogram, which should not be used to represent the natural history of neonatal hyperbilirubinemia.
Fig 3. Guidelines for phototherapy in hospitalized infants of 35 or more weeks' gestation.

Note: These guidelines are based on limited evidence and the levels shown are approximations. The guidelines refer to the use of intensive phototherapy which should be used when the TSB exceeds the line indicated for each category. Infants are designated as "higher risk" because of the potential negative effects of the condition listed on albumin binding of bilirubin, the blinding of the brain, the susceptibility of the brain to damage by bilirubin, and the increased risk of IVH. "Intensive phototherapy" implies irradiance in the blue-green spectrum (wavelength of approximately 450-490 nm) of at least 30 mW/cm² per mm (measured at the infant's skin directly below the center of the phototherapy unit) and delivered as much of the infant's surface area as possible. Note that irradiance measured directly below the center of the light source is much greater than that measured at the periphery. Measurement should be made with a radiometer specified by the manufacturer of the phototherapy system.

See Appendix 2 for additional information on measuring the dose of phototherapy, a description of intensive phototherapy, and of light sources used. If total serum bilirubin levels approach or exceed the exchange transfusion line (Fig 3), the sides of the bed, incubator, or warmer should be lined with aluminum foil or white material. This will increase the surface area of the infant exposed and increase the efficacy of phototherapy.

If the total serum bilirubin does not decrease or continues to rise in an infant who is receiving intensive phototherapy, this strongly suggests the presence of hemolysis.

Infants who receive phototherapy and have an elevated direct-reacting or conjugated bilirubin level (cholestatic jaundice) may develop the bronze-baby syndrome. See Appendix 2 for the use of phototherapy in these infants.
Circumcision

Pros:
- Less STD transmission (if unprotected sex)
- Less UTIs and penile cancer (very low baseline risk anyway)
- Commonly done in the U.S.

Cons:
- Risks: bleeding, removing too much or too little foreskin, infection, needing a "re-do"
- No real medical reason to do it
- The AAP has said there is not enough evidence either way to make a recommendation. Therefore, it is left to personal choice.

The OBs do the circumcisions and should be notified prior to the discharge day by making a notation on the NBN board in the “circ” column.

Contraindications include: suspicion of bleeding disorder, small size (determined by OB), hypospadias, ambiguous genitalia.

Feeding

All mother and baby charts should have documented whether the mom plans to breast OR bottle feed. "Both" should not be recorded as we do not recommend any formula supplementation unless there is a medical reason or until the baby is at least two weeks old.

All mothers should be taught to feed their baby on cue, at least 8-12 times in a 24-hour period.

All mothers should be taught about breastfeeding (See Admission teaching).

If there is a medical indication for supplementing, or if the mom – after being counseled – still would like to offer one, then set the following parameters:

- OK to supplement 15 mLs (1st 48 hours) or 30 mLs (after 48 hrs), every feeding, after breastfeeding attempt.
- Mom should pump on both sides for at least 10 minutes or until milk stops flowing (whichever is LONGER!). This way, the breasts do not miss out of the opportunity to be “told” to make milk.
- Involve the Lactation Consultant.
- Any supplementation requires a physician’s order.

Breastfeeding "Pep Talk" - For all New Moms Planning to Breastfeed:

- We think it is the best way to feed your baby!
- Try to keep the baby in the room with you all the time so you can nurse frequently.
- Put your baby to the breast within the first hour of life.
- You have exactly what your baby needs from the very first day.
- Feed your baby on cue, day and night, at least 8-12 times in 24 hours.
- Your breasts will not FEEL full until 3 to 5 days.
- DO NOT offer any formula to your baby...this will hurt your chances of teaching your baby how to breastfeed; talk with us BEFORE giving your baby any formula.
- Ask for help if you need it from the nurses, doctors, or Lactation Consultants.
- Breastfeeding SHOULD NOT be painful—keep adjusting and get help if you are feeling pain!
- Do not use a pacifier for the first month or until breastfeeding is well-established.
Glucose

There is a protocol posted for babies at risk for hypoglycemia (including infants of diabetic mothers, SGA, preemies, stress, sick infants, sick infants, hypothermic infants, etc).

A glucose level of 40 or higher is considered “normal” (can be as low as 25 in first 4 hours per AAP), and levels must be consistently above 45 in order to stop checking.

If the level is below 40, follow the protocol to feed the baby by breast or bottle, depending on mom’s plans. If the baby remains symptomatic, or cannot po feed, or level is persistently low, the baby will need an IV Dextrose bolus with D10 (or higher if needed), and may need to go to ICN for IVF if not able to keep up or po feed.

Anytime the sugar is low, the protocol should be started (or re-started).

Group B Strep/Infection Risk

If moms are GBS positive or are unknown (unless they were a C/S and not ruptured prior to delivery), it is important to know whether they received antibiotics prior to delivery and, specifically, how many doses and how long before delivery. **1 dose at least 4 hours prior to delivery is considered “adequate” treatment, and the baby is treated as normal. Anything less than 4 hours is considered “inadequate” and the baby is usually observed for close to 48 hours.**

In babies in whom infection is suspected (i.e. they are acting sick):

- Get blood cultures and LP
- Start antibiotics (amp and gent) and continue for at least 48 hours
- Repeat CBC 12 hours later

**If mom has "true" chorio** (i.e. fever with uterine tenderness, purulent or foul-smelling fluid, tachycardia, etc.), this is the one exception in which even the well-appearing baby should be placed on 48 hours of antibiotics and have a CBC and Blood Culture according to the CDC guidelines, due to the much higher risk of infection in the baby.

**Hepatitis B**

All babies receive their first vaccine in the hospital. The nurses administer the shot in the thigh, well before discharge, and the baby can sometimes get a little redness or swelling at the site. Usually there are no other side effects.

The nurses "consent" the moms for the vaccine by telling them about it, handing them a VIS (vaccine information sheet), and having the mom sign the immunization sheet. If there are questions or the mom “declines”, the nurse will alert the resident for further discussion.

If the mom is Hep B surface Antigen positive, the baby needs to receive **both the vaccine AND HBIG within 12 hours of birth.**

If the mom is Hep B unknown, the baby needs the vaccine within 12 hours while we wait for mom’s result. If it is still not known at the time of discharge, there is one week in which to find the answer; however, most PCPs do not have HBIG, so we often give it prior to discharge anyway.

If parents decline the Hep B vaccine, this needs to be documented in the chart on the Discharge assessment.

The date the vaccine was given needs to be documented on the discharge checklist.
Output

Babies should void at least once in the first 24 hours of life, and stool at least once in the first 48 hours.

A rough estimate of urine output is one void per number of days old (1 day, 1 void, etc.), all the way up to 6, when they should begin having at least 6-8/day.

Transition (green or brown) or yellow stools should be documented in the chart as well as the number of voids and stools.

V. Standard Newborn Evaluation

History

1. Date, time and location of birth, referring MD/hospital
2. Birth weight
3. Sex, race
4. Gestational age (EGA)
   - by dates (mother’s estimate)
   - by pre-natal exam (obstetrician’s estimate) (i.e. serial fundal heights, first fetal heart tone, sonography)
   - by post-natal exam - Ballard assessment (estimate)
5. Mother’s age and history of previous pregnancies (Gravid = # pregnancies; Para = # births; AB = # abortions, spontaneous or therapeutic; living = # children living - summarized, for example, as G3, P2, AB1, L2)
6. Blood types of mother and baby, Coombs test, mother’s antibody screen; ABO & Rh incompatibility
7. Maternal Labs
   - VDRL
   - Hepatitis B
   - HIV
   - GC, chlamydia
   - Group B strep status
   - Amniocentesis-genetic or for lung maturity
8. Complications of pregnancy, labor and delivery
   - Maternal illness/infections
   - Use of drugs, prescribed and non-prescribed
   - Alcohol and smoking
   - Duration of labor/premature labor - tocolytic drugs
   - Duration of rupture of membranes - evidence of maternal infection/colonization culture results/ antibiotic therapy
   - Type of delivery - spontaneous vaginal (SIVA), forceps, C-section
   - Characteristics of amniotic fluid - oligohydramnios, polyhydramnios, meconium stained
   - Abnormal presentation
   - Fetal monitoring
   - Anesthesia used
9. APGAR scores at one and five minutes and every five minutes thereafter until score exceeds six
10. Neonatal course to date
11. Social history
    - Where mother lives
    - Role of father in family
    - Other members of the household
    - Financial support
    - Emotional support
12. Plans for feeding - breast or bottle
13. Plans for well child care and immunizations
Physical Exam

1. Vital signs, measurements
   (descriptive terms: T, P, R, BP; Wt, length, head circumference, including percentiles)
2. General appearance
   - level of activity (active/lethargic)
   - general perfusion and color (pink/blue/mottled/pale/yellow; edematous/dehydrated; well developed)
   - nutritional status/state of hydration
   - gross abnormalities
3. Skin
   - vernix
   - capillary hemangiomas (benign): most common on eyelids, forehead, back of neck - occasionally on trunk or extremities
   - mongolian spots (benign)
   - cafe-au-lait spots: > 5 suggestive of neurofibromatosis (if all > 1.5 cm in diameter)
   - milia: superficial epidermal inclusion cysts - generally on face
   - erythema toxicum
   - "parchment skin": seen in post-term babies
   - dryness, turgor: assess hydration
   - petechiae
     - common, benign: usually on face and upper body - occurs 2° intra-thoracic pressure as the chest passes through the birth canal
     - uncommon: pathologic as a result of thrombocytopenia; important to note distribution and watch for progression
   - "sucking blisters": hands
   - abrasions
   - peeling of skin in postmature baby
   - jaundice
4. Head
   - shape
   - molding
   - asymmetry: may be normal 2° fetal posture or abnormal 2° structural defect
   - appearance
   - bruising
   - scalp: internal monitor sites, scalp blood sampling sites
   - forceps marks
   - hair distribution
   - palpation
   - caput succedaneum: diffuse, generally symmetric scalp edema 2° vertex presentation (usually resolves in first few days); edema crosses sutures
   - cephalohematoma: sub-periosteal hemorrhage; feels like boggy edema but is located over one particular bony area; may take months to resolve; never crosses sutures; can indicate linear skull fracture or more occult intracranial bleeding
   - sutures: craniotabes is a soft area in parietal bone near the sagittal suture
   - palpable fractures
5. Fontanelles
   - anterior and posterior
   - may suggest increased intracranial pressure if bulging open wide fontanelle extending into frontal area
6. Eyes
   - may be hard to assess in first 24 hours due to edema of lids
   - reactivity of pupils (PERRL = Pupils equal, round, reactive to light)
   - red reflex exam for retinoblastoma, corneal opacities
- lens
- test for congenital cataracts
- discharge
- conjunctival hemorrhage: common, may be benign; occurs 2° increase in intra-thoracic pressure when the chest passes through the birth canal
- inter-canthal distance: if increased or decreased may suggest a congenital syndrome
7. Ears
- external appearance: shape and position
  - low set ears may suggest a congenital syndrome such as Down syndrome
- external canals: check for patency, atresia
- tympanic membranes: canals may be too tortuous to allow visualization
- preauricular sinus and tags: may be associated with renal anomalies/hearing loss
8. Nose
- external appearance: congenital abnormalities, atresia
- flaring of nostrils: may suggest respiratory distress
- patency of nares: congestion/discharge
9. Mouth
- external appearance: cleft lip, shape, etc
- precocious dentition (supernumerary teeth)
10. Palate
- structural abnormalities
  - cleft: may lead to feeding problems aspiration etc. in the immediate neonatal period
  - high arched: may suggest congenital syndrome
- lesions
  - Epstein Pearls: whitish nodules on palate; benign, common; accumulation of epithelial cells
11. Neck
- tone: increased may indicate neurological disease
- palpitation: masses include thyroid, cystic hygroma, branchial cleft/cysts
- mobility: congenital torticollis (may palpate mass as well)
12. Chest
- appearance
  - congenital deformities may cause asymmetry
  - retractions: sub-xiphoid or intercostal suggest respiratory distress with increased effort of breathing
- respiratory pattern: rate and rhythm commonly quite variable; > 60 resp/min for sustained time is abnormal
13. Lungs
- auscultation
  - rales, wheezes, rhonchi, grunting
  - compare air movement on each side and between lung zones
14. Heart
- cyanosis: central vs acrocyanosis
- precordial activity
- rhythm and rate (RRR = regular rate and rhythm)
  - commonly quite variable
  - may range from 100-180 in various states of rest/activity
  - extra systoles and sinus pauses common
- S1, S2: may be grossly abnormal in valvular heart disease
- murmurs
  - murmur = m
  - grade I-VI (written e.g. II/VI)
  - describe location and quality
  - murmurs in first day from a closing ductus are common
any murmur still present on third day should be evaluated
- gallops
- extra heart sounds very difficult to hear at the rapid heart rate of a newborn

15. Pulses
- palpate in each extremity and compare side to side and UE to LE
- decrease in LE pulse or delay in transmission to LE vs UE may indicate coarctation of the aorta
- pulse graded 0-4+: 0 = Absent, 2+ = Normal, 4+ = Bounding

16. Abdomen
- observation: distended, discolored, scaphoid
- bowel sounds: may not be present early in life
- palpation: for masses, distension etc.
- umbilicus: number of cord vessels
- liver: commonly palpable up to 1 cm below the right costal margin
- spleen: may be just palpable under left costal margin
- kidneys: usually palpable, at least in part, in a very relaxed infant who allows deep palpation; palpable large kidneys suggestive of hydronephrosis

17. Genitalia
- inspection
  - examine all structures to ascertain if they are clearly male or female
  - particularly check for location of the urethral orifice; may be displaced (hypospadias, epispadias) in what appears to be male infant (may be male or virilized female)
  - foreskin is often tight and appears closed
  - female genitalia may appear enlarged in proportion to the other body structures 2° the effects of maternal hormones and/or prematurity
- palpation
  - palpate for testes in the scrotum or inguinal canal
  - scrotal enlargement may be 2° hydrocele which is relatively common - diagnose by transillumination as well as palpation (intermittent, recurrent hydrocele is suggestive of hernia)
  - testes may be in canal or not palpable in ELBW infant
- discharge
  - females may have a clear mucous discharge or even blood ("pseudomenses") 2° hormonal stimulation in utero with sudden withdrawal in post-partum
- circumcision
  - may look quite edematous and erythematous
  - watch for difficulty urinating after procedure

18. Breasts: may not be visible in ELBW; term infant may have prominent breast tissue, hormonally stimulated

19. Rectum: check for patency (evidence of stooling), fissures (may see bloody stools), placement (may be anterior)

20. Hernia: check inguinal regions; diastasis recti (midline weakness of the abdominal musculature) is common and may simulate a ventral hernia

21. Spine
- inspect and palpate for deformity, deviation
- inspect for dermal sinus tracts: may be anywhere along the midline from the nose, over the skull and down the spine to the sacrum
- any dimple should be carefully examined to be sure that the bottom of the pit is visible (traction on the skin helps exam)
- any discoloration or hairy lesion should be evaluated

22. Clavicles: inspect for asymmetry; palpate for fractures (common birth trauma)

23. Extremities
- inspect for deformities - fetal position may cause some apparent abnormalities that are self-correcting
- check joints or observe for range of motion: term infants are normally quite flexed as a general posture
- check palmar creases
- hips - test for congenital dysplasia by:
- observing for differences in leg movement
- check for differences in leg length
- checking for asymmetry of leg skin folds (misleading)
- manipulation of the hips (abduction) with fingers over the greater trochanter and feeling for (or hearing) clicks
- Barlow & Ortoloni maneuvers
  - Digits: count them; extra digit buds or skin tags are not uncommon (often familial)

24. Neuro
- degree of alertness
- spontaneous movement
- position
- tone
- grasp, suck, Moro, root
- DTRs
- response to light, sound
- facial, brachial plexus palsies

25. Cord (Umbilicus)
- check for secure clamping
- count and document the arteries (2, thick-walled) and vein (single, thin walled) in the remnant

26. Voiding
- 95% of infants void in the first 24 hours
- 98% void in the first 48 hours
- most common reason for "delay" in voiding is missing urination at birth

27. Stools
- 90% of infants pass stool in the first 24 hours
- 98% stool in the first 48 hours
- prolonged time without stooling suggests meconium ileus (cystic fibrosis), meconium plug, or other congenital defect

Ballard Determination of Gestational Age

Newborn Nursery Psycho-Social History – Note in chart for all new admissions

1. Where Mother Lives
2. Role of Biologic Father in Family
3. Other members of the household
4. Financial Support
5. Social Support
6. History of Domestic Violence
7. Any Legal Concerns (benefits, custody, criminal)
8. History of Substance Use
9. Smokers in the House?
10. City water or Well water?

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