Physical Assessment Performing in the Newborn

What is Physical Assessment of the Newborn?
› Physical assessment is a systematic head-to-toe evaluation of a patient’s body systems. In newborns, a thorough physical assessment is typically performed within 24 hours of birth, with assessment usually performed earlier for newborns who experienced physical distress during labor and delivery, and for those in whom physical abnormality is suspected
• What: The purpose of physical assessment of the newborn is to identify abnormal findings so that any necessary therapeutic interventions can be implemented
• How: Most procedures performed during the initial and detailed assessments are noninvasive, although moderately invasive procedures such as phlebotomy can be required if additional testing becomes necessary
• Where: Physical assessment of the newborn is performed in any setting where infant birth occurs, including the inpatient setting, birth center, or home
• Who: A brief initial assessment of body systems is performed by a nurse, physician, or mid-level healthcare provider (e.g., a nurse practitioner) at the time of birth. A more detailed assessment of all body systems is performed by a physician or a mid-level practitioner within 24 hours of birth. A brief assessment is then performed every 4–8 hours by clinical nursing staff, or more frequently if deviations from normal findings (e.g., hypothermia or hypotonia) were noted during previous examinations. These responsibilities should not be delegated to assistive clinical staff. The parents should be present whenever possible during the assessment of their newborn

What is the Desired Outcome of Physical Assessment of a Newborn?
› Physical assessment of the newborn is performed to
• screen the newborn for physical abnormalities and common neonatal problems
• identify newborns who require urgent treatment
• provide a baseline for all subsequent assessments of physical condition
• review and address any concerns the parents may have about the newborn

Why is Physical Assessment of a Newborn Important?
› Early identification of physical abnormalities allows for more timely focused evaluation and treatment
› Baseline assessment findings allow for earlier identification and treatment of medical conditions later in the child’s life

Facts and Figures
› Approximately 3–4% of full-term newborns have a major physical malformation such as an abnormality of the central nervous system, heart, or gastrointestinal system (Liptak, 2006)
• An estimated 0.1–0.2% of babies are born with a potentially life-threatening heart defect (Mellander, 2013)
Pulse oximetry in addition to the newborn physical assessment has been identified as a cost effective and minimally invasive method of screening for and identifying congenital heart disease in newborns (Roberts, et al., 2012)

What You Need to Know Before Performing Physical Assessment of a Newborn

Newborns can easily become chilled because of their relatively large body surface area and difficulty regulating body temperature. Many clinicians use radiant heaters to keep newborns warm during the assessment, which reduces the risk for hypothermia during the examination.

A checklist format is often used for charting the newborn assessment findings.

Prior to performing the examination, it is important to review the newborn’s prenatal and labor/delivery history and information about any areas of concern (e.g., changes in feeding behaviors) noted during previous assessments.

In addition to the systems assessment, evaluation for the presence of prenatal growth abnormalities is performed by comparing the newborn’s birth weight, length, and head circumference to the growth parameters of other newborns of the same gestational age using standard growth charts. Standard growth charts list normal values as those greater than the 5th percentile and less than the 95th percentile for age. For details of growth abnormalities, see Other Tests, Treatments, or Procedures That May Be Necessary Before or After Performing Physical Assessment of the Newborn, below.

Maternal hormones cross the placenta to the fetus and can cause transient hormone-related effects. Swollen breasts can appear at birth and up to day 3 in both male and female newborns and can be accompanied by production of a small amount of milky fluid; swollen breasts typically disappear without treatment after 2–3 weeks of life. Infantile menstruation (i.e., a scanty amount of bloody vaginal drainage) can occur in female newborns, because maternal hormones can cause the endometrial lining of the female fetus to thicken. This lining subsequently dissolves and is excreted through the infant’s vagina. Infantile menstruation usually resolves within 1–2 days.

Preliminary steps that should be performed before performing a physical assessment of the newborn include the following:

- Review the facility/unit-specific protocol for performing a newborn physical assessment, if one is available
- Review the treating clinician’s orders for physical assessment of the newborn
- Verify parental completion of facility informed consent documents
- Review the patient’s medical history/medical record for antenatal or labor and delivery problems

Gather supplies, including the following:
- Sterile/nonsterile gloves; additional personal protective equipment (PPE; e.g., gown, mask, eye protection) can be needed if exposure to body fluids is anticipated
- Stethoscope
- Light source (e.g., an ophthalmoscope or small flashlight)
- Thermometer, based on facility/unit-specific protocol for temperature-taking in the newborn
  - A rectal thermometer provides the most accurate measurement of core body temperature
  - Temperature is never to be measured orally in a neonate, although an oral thermometer can be used to measure axillary temperature
- Automatic blood pressure device with a blood pressure cuff size appropriate for the newborn
- Flexible tape measure
- Radiant warmer, if necessary
- Baby scale
- Written information, if available, to reinforce verbal education

How to Perform Physical Assessment of a Newborn

Perform hand hygiene and don PPE

Identify the newborn using two unique identifiers according to facility protocol

Establish privacy by closing the door to the patient’s room and/or drawing the curtain around the crib

Introduce yourself to the parents and other family members, if present, explain your clinical role; assess the coping ability of the parents and family members and for knowledge deficits and anxiety regarding newborn physical assessment

Determine if the parents/family requires special considerations regarding communication (e.g., because of illiteracy, language barriers, or deafness); make arrangements to meet these needs if they are present

- Use professional certified medical interpreters, either in person or via phone, when language barriers exist

Explain the procedure for newborn physical assessment and its purpose; answer and questions and provide emotional support as needed

Promote the newborn’s safety during the examination
• Reduce the newborn’s risk for hypothermia by using a radiant warmer or covering baby in a warm blanket as much as possible during the exam
• Maintain at least one hand on the infant at all times for support; do not step away from an infant lying on a bed, table, or isolette with sides down

› Perform a physical assessment of the newborn according to body systems in a head-to-toe manner
• The evaluation information that follows is appropriate for the initial assessment of the newborn and for the routine assessment performed by the nurse at least every 8 hours. These descriptions are not exhaustive, but instead cover normal findings and some commonly observed abnormalities. Additional and more extensive assessments should be performed by the treating clinician if abnormalities are noted during the initial assessment

› Perform general growth measurements. Normal findings include the following:
• Birth weight 5.6–8.8 lbs. (2,500–4,000 g)
• Head circumference 12.9–13.7 in (33–35 cm)
• Chest circumference 12–13 in (30–33 cm)
• Head to heel length 19–21 in (48–53 cm)

› Assess vital signs. Normal findings include the following:
• Temperature
  – Axillary 97.7–98.6 °F (36.5–37.0 °C)
  – Rectal 98.6–100.4 °F (37.0–38.0 °C)
• Apical heart rate 102–140 beats/min
• Respiratory rate 30–60 breaths/min
• Blood pressure ~ 65/40 mm Hg

› Assess posture
• Normal: Moderate flexion of the neck and extremities
• Abnormal findings include opisthotonos (i.e., extreme hyperextension of the body in which the head and heels are bent backward and the body bowed forward), which suggests the presence of severe neurologic dysfunction

› Assess skin
• Normal skin findings include the following:
  – Variation in skin color is usual; pink to red skin color is common in newborns with lighter complexions, and darker skin color with a pink to red undertone is common among newborns with darker complexions. Mucous membranes are pink to red
  – Skin can be puffy and smooth in appearance
  – Transient acrocyanosis (i.e., cyanosis of the hands and feet) is normal during the first few hours after birth
  – Turgor (i.e., the level of skin elasticity) is normal, as reflected by a rapid return of the skin to its original position after being gently pinched
  – Edema is often present around the eyes, face, legs, and scrotum or labia
  – Desquamation (i.e., peeling of the skin) is common during the first 2–4 weeks of life, and is most noticeable on the nose, knees, buttocks, and elbows
  – Physiologic jaundice (i.e., a yellow coloration of the skin) can appear 2–3 days after birth; this typically disappears spontaneously by 7–10 days of age. Physiologic jaundice is caused by increased blood levels of bilirubin during the first few days of life, and is a normal part of red blood cell metabolism in newborns
  – Milia (i.e., small pinpoint white or yellow spots caused by increased fat secretion from the sebaceous glands) are common on the nose and chin of the newborn, and disappears spontaneously 1–2 weeks after birth
  – Vernix caseosa (i.e., a white, soft, creamy substance), commonly called vernix, can thickly cover the newborn’s skin or be present only in body crevices
  – Lanugo (i.e., soft, fine hair on the shoulders, back, and forehead of some neonates) is more pronounced in premature babies and disappears during the first weeks of life
  – Mongolian spots (i.e., a dark coloration on the lower back, buttocks, and anterior trunk of newborns with dark complexions) might be present but disappear spontaneously by 3–4 years of age
• Abnormal skin findings include
  – Pallor (i.e., pale skin)
  – Cyanosis in areas other than the hands and feet
• Normal head findings include the following:
  – Overriding coronal sutures (i.e., slight overriding of the frontal bone and the parietal bones of the skull)
  – Fontanelles that are soft and flat without a bulging or sunken appearance, although some bulging normally appears with crying
  – Normal changes that can cause transient asymmetry of the head include
    - cephalhematoma (i.e., a hemorrhage under the periosteum of the cranial bones caused by trauma to the scalp and periosteum during labor), which can develop several hours after birth, typically increasing in size for 2–3 days; resolving spontaneously by age 6 weeks
    - caput succedaneum (i.e., edema of the scalp caused by pressure during labor); if present, caput succedaneum is obvious at birth and typically resolves without treatment within 1 week
• Abnormal head findings include
  – fused sutures (i.e., immobility of the sutures between the frontal bone and the parietal bones of the skull)
  – bulging or depressed fontanelles
  – abnormally shaped facial structures
  – mandibular hypoplasia (i.e., incomplete development or underdevelopment of the lower jaw)
  – forceps injury (i.e., bruising of the skin in an area where forceps were applied during delivery)
  – facial palsy, which can be partial or complete

• Normal eye findings include the following:
  – Blink reflex in response to light
  – Pupils constrict in response to light
  – Brief visual fixation on objects
  – Lids that are mild to moderately edematous
  – Eye color that can appear to be gray, dark blue, or brown. True eye color is not apparent until 3–6 months of age
• Abnormal eye findings include
  – asymmetry
  – subconjunctival hemorrhage
  – cataracts
  – conjunctivitis

• Normal ear findings include the following:
  – Top of the ear that is even with or above the outer side of the eye
  – Exhibiting a startle response to loud, sudden noise, which indicates that the newborn can hear
  – Pinna flexible, with cartilage present
• Abnormal ear findings include
  – abnormal shape
  – low set ears compared with normal placement
  – lack of startle response to sound
  – forceps injury (e.g., bruising of the skin in the ear area where forceps were applied during delivery)
  – skin tags on the ears

• Normal nose findings include the following:
  – Nostrils that are patent
  – Thin, white nasal discharge
  – Nose that is flexible with normal conformation (i.e., shape)
• Abnormal findings include
  – nasal flaring
  – abnormal shape of the nose

• Normal mouth and throat findings include the following:
  – Intact, high-arched palate
  – Uvula in midline
Mucous membranes of the mouth can be moist or appear dry because of minimal salivation.
Epstein pearls (i.e., white, shiny spots) near the center of the hard palate.
Edge of the gums can be even or irregular.

Abnormal mouth and throat findings include:
cleft lip/palate

Assess neck
Normal neck findings include the following:
Neck is short and surrounded by skin folds.
Abnormal neck findings include the presence of:
webbing
masses

Assess chest
Normal chest findings include:
Enlarged breast tissue, which is present in most newborns.
Milky nipple discharge, which does not occur in all newborns.
Abnormal findings include:
the presence of extra nipples

Assess circulatory system
Normal circulatory system findings include:
Maximal cardiac impulse (i.e., the chest site where the heart beat can be heard loudest) is at the fourth to fifth intercostal space, lateral of the left sternal border.
S2 heart sound that is louder and higher in pitch than S1.
Innocent heart murmurs (i.e., soft, faint, heart murmurs that are nonpathologic), which are present in about 50% of newborns.
Pulse rate that is regular and of moderate strength.
Abnormal circulatory system findings include:
arrhythmia
pathologic heart murmur
tachycardia
bradycardia
difference in rates of peripheral and apical pulses
pulse rate that is bounding (i.e., overly full on palpation) as a result of an increased thrust cardiac output or an increased volume of circulating blood, or faint (i.e., scarcely perceptible) caused by inadequate cardiac output or decreased blood volume

Assess respiratory system
Normal respiratory system findings include:
Abdominal breathing is present, characterized by the abdomen rather than the chest rising and falling with respiration.
Abnormal respiratory system findings include:
cyanosis in areas other than hands and feet
tachypnea (i.e., increased respiratory rate)
retractions (i.e., pulling inward of tissue between the ribs) with each breath caused by difficulty breathing
grunting
crackles/wheezes noted on auscultation

Assess abdomen
Normal abdominal findings include:
The abdomen is rounded in shape.
Umbilical cord stump is bluish-white with two arteries and one vein visible.
The edge of the liver is palpable at 0.5–1.0 in (2–3 cm) below the costal margin (i.e., the lower edge of the ribs) to the right of the xiphoid process.
The spleen is not usually palpable at birth.
Bowel sounds are present.
Frequent eructation (i.e., burping) is common because of air swallowed during feeding.
• Abnormal abdominal findings include
  – a distended appearance
  – an umbilical cord with two instead of three vessels
  – umbilical cord inflammation or drainage
  – enlargement of the liver, spleen, or kidneys
  – reduced or absent bowel sounds

› Assess genitourinary system
• Normal genitourinary system findings include the following:
  – Urine is present in the newborn’s bladder and the newborn urinates
  – Female genitalia: The urethral meatus is at its normal position above the vagina and at the base of the clitoris. Vernix is usually visible between the labia. Because a small amount of the mother’s maternal hormones remain in the newborn’s bloodstream for a few days, the labia and clitoris are typically swollen and infantile menstruation may occur
  – Male genitalia: the urethral opening is at the tip of the glans penis, and two testes are present and palpable, one on each side of scrotum. The scrotum is usually edematous, pendulous, covered with rugae, and darker in pigment compared with skin on the rest of the body

• Abnormal genitourinary system findings include
  – abnormal shape of the genitals in newborns of either gender
  – abnormal position of the opening of the urethra in the male, e.g., hypospadias (i.e., below the normal position) or epispadias (i.e., above the normal position)
  – undescended testes in males

› Assess extremities
• Normal extremity findings include the following:
  – Five completely formed, discrete fingers on each hand and toes on each foot
  – Full range of motion in all extremities
  – Crease at the anterior two thirds of the sole of the foot
  – Symmetrical extremities
  – Equal bilateral brachial pulses
  – Nail beds that are pink with transient cyanosis immediately after birth

• Abnormal extremity findings include
  – fractures
  – paralysis
  – weakness
  – polydactyly (i.e., extra fingers)
  – syndactyly (i.e., fingers are partially fused or fused along the entire length of the finger)

› Assess hips
• Normal hip findings include the following:
  – Full range of motion is present in both hips
  – Skin creases are symmetrical

• Abnormal hip findings include
  – limitation in range of motion
  – asymmetrical skin creases

› Assess spinal column
• Normal spinal column findings include the following:
  – Normal shape
  – Full range of motion
  – Intact skin covering the spinal column

• Abnormal spinal column findings include
  – abnormal spinal column shape, e.g., scoliosis (i.e., a partial deviation to one side)
  – the presence of a mass
  – sinus tract (i.e., a narrow channel) that allows the escape of fluid from the spinal canal
  – myelomeningocele (i.e., protrusion of the spinal cord and its meninges through a defect in one or more of the vertebra)
spina bifida (i.e., protrusion of some or all of the spinal cord though a defect in the vertebral column); this condition includes myelomeningocele; but also involves defects that are larger in size, and involve a large spinal section or the entire spine.

Assess anus
• Normal anus findings include the following:
  – The anus is patent
  – Blackish-greenish meconium (i.e., soft stool) is present
• Abnormal anus findings include
  – Imperforate anus (i.e., the anus is not patent because of the presence of skin or muscular tissue)
  – Fistula (i.e., an abnormal passageway) between the rectum and the outside of the body is present, bypassing the anus
  – Patulous (i.e., widely open) anus

Assess nervous system
• Normal nervous system findings include the following:
  – Normal nervous system control of muscle movement and tone
  – Normal reflex responses (for details, see *Common normal newborn reflexes and how they are elicited*, below)
• Abnormal nervous system findings include
  – Hypotonia (i.e., decreased muscle tone)
  – Hypertonia (i.e., increased muscle tone)
  – Seizures
  – Over- or underreactive reflexes

Assess common normal newborn reflexes
• Plantar reflex
  – Stroke inner sole of the foot
    – Toes curl around ("grasp") examiner's finger
  – Stroke outer sole (called Babinski reflex)
    – Toes spread, great toe dorsiflexion
– Doll's eyes
  – Give one forefinger to each of the newborn’s hands; the newborn grasps both forefingers
  – Pull the newborn to a sitting position using both forefingers
  – The newborn’s eyes open when in a sitting position (like many doll's eyes)
  – Head initially lags, and the newborn uses the shoulders to correct head position
• Walking reflex
  – Hold the newborn up with one of his/her hands across his/her chest
  – As the newborn’s feet touch the ground or surface of the exam table, the newborn performs walking motions
• Protective reflex
  – Place a soft cloth over the newborn’s eyes and nose
  – The newborn arches the head and turns the head from side to side
  – The newborn brings both hands to the face to move the cloth
• Rooting reflex
  – Touch the newborn on the side of either cheek
  – The newborn turns the head in an attempt to find the breast to feed
• Tonic neck (also called fencing) reflex
  – Rotate the newborn’s head leftward
    – The left arm stretches into extension
    – The right arm flexes up above the head
    – The opposite reaction occurs if the head is rotated to the right, such that the right arm stretches into extension and the left arm flexes up above the head
• Moro reflex (also called the startle reflex)
  – Hold a supine newborn by the arms a few inches above the bed
  – Gently drop the newborn backward while not allowing the head to touch the bed
  – The newborn extends both arms outward and grimaces
• Hand-to-mouth reflex
  – Stroke the newborn’s cheek or put a finger in the newborn’s palm
- The newborn will bring his/her fist to the mouth
  - Swimmer's reflex
- Hold the newborn prone while supporting the belly with hand
- Stroke along one side of newborn’s spine
- The newborn flexes the whole body toward the side being stroked
  - Crawling reflex
  - Place the newborn on the abdomen
  - The newborn pulls the knees under the body and makes crawling movements

Dispose of used materials in proper receptacles and perform hand hygiene

Update the newborn’s plan of care, if appropriate, and document the physical assessment and the newborn’s response in the medical record, including the following information:

  • Date and time of the assessment
  • Description of the physical assessment and findings, including
    – details of the assessment, including status of body systems
    – reflexes that were evaluated
    – the newborn’s body measurements and vital signs
    – any variation from the expected findings, interventions performed, and whether or not the treating clinician was notified
  • Laboratory specimens collected and sent for analysis
  • Newborn’s response to the physical assessment
  • Any interventions ordered by the treating clinician based on abnormal findings, if present
  • Parent/family member education, including topics presented, response to education provided/discussed, plan for follow-up education, and details regarding any barriers to communication and/or techniques that promoted successful communication

Other Tests, Treatments, or Procedures That May Be Necessary Before or After Performing Physical Assessment of a Newborn

Abnormalities noted by the nurse during physical assessment of the newborn will be reported to the treating clinician, who will evaluate the newborn in more detail

• For example, newborns with length or weight measurements outside the normal range should be evaluated in more detail by the treating clinician for the presence of a growth abnormality causing them to be small or large for gestational age. Frequently, serial blood sugar monitoring will be ordered for newborns with abnormal weight to ensure that both small and large infants are maintaining appropriate blood glucose levels. In some cases, deviations in values are normal in newborns of a family with large or small stature
• If the infant is in an inpatient setting, additional routine assessments that are not included in the standard initial physical assessment will likely be performed, such as a newborn hearing screening, a transcutaneous bilirubin screening, and a metabolic disease screening

What to Expect After Physical Assessment of a Newborn

Physical abnormalities of the newborn are detected, evaluated, and treated as necessary

Baseline physical examination parameters are obtained for comparison to later findings

Red Flags

Innocent heart murmurs are heard in about 50% of newborns and do not reflect abnormalities of the heart. However, any newborn with a heart murmur should be evaluated in more detail by the treating clinician or a pediatric cardiologist if necessary, to confirm that the murmur is not caused by cardiac pathology. The murmur should be rechecked at regular intervals by the treating clinician to confirm that it resolves over time and that no cardiac abnormalities develop

Abnormal physical assessment findings in the newborn within the first 24 hours of life (e.g., jaundice, lack of meconium stool) require urgent, and in some cases emergent action when identified

Blocked nostrils pose a significant risk for respiratory impairment in the neonate, because most newborns breathe effectively only through the nose. Nostrils of newborns should be kept free of secretions to allow normal respiration and reduce risk for respiratory distress, which is indicated by

  • restlessness
  • cyanosis other than in the hands and feet
  • nasal flaring
• expiratory grunt that is heard with or without a stethoscope

What Do I Need to Tell the Patient’s Family?
› Educate the family about what to expect during and after the newborn assessment. Encourage questions
› If laboratory testing or other diagnostic procedures are ordered, explain how these procedures are performed and when the results will likely become available
› Educate the family about clinical signs and symptoms that could indicate abnormalities in the neonate, which should be reported to the treating clinician. These signs and symptoms include but are not limited to
• refusal to feed for more than one feeding
• changes in elimination (e.g., diarrhea)
• fever (i.e., rectal temperature greater than 100.5 °F [38.5 °C])
• excessive crying/inconsolability
› Provide contact information for the healthcare provider who will be in charge of the neonate’s ongoing care. When the newborn is discharged from acute care, explain how the family can contact the treating clinician if questions or problems arise.

Note
› Review of the literature has found no updated research evidence on this topic since previous publication on April 29, 2016

References