

# EXAMINATION OF NEWBORN INFANT

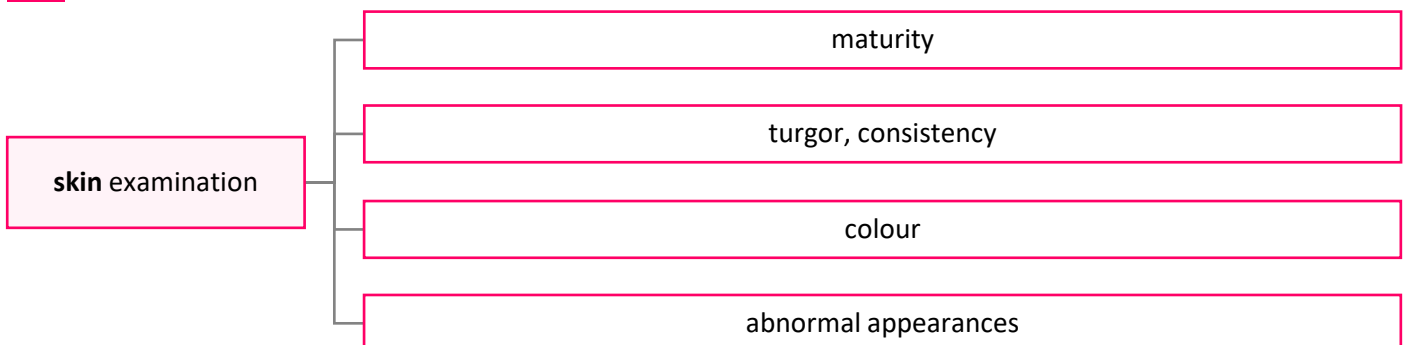
## MAIN VITAL SIGNS

|                  |                                                                                                                                                                                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| respiratory rate | <ul style="list-style-type: none"><li>– a normal respiratory rate is roughly <b>40-60 breaths per minute</b></li><li>– newborns tend to have an irregular breathing pattern</li><li>– no signs of respiratory disorders</li></ul>                                                                                                   |
| heart rate       | <ul style="list-style-type: none"><li>– a normal heart rate is <b>90-160 beats per minute</b></li></ul>                                                                                                                                                                                                                             |
| body temperature | <ul style="list-style-type: none"><li>– should be taken in the groin</li><li>– temperature rate is between <b>36,5 and 37,5°C</b></li></ul>                                                                                                                                                                                         |
| pulse            | <ul style="list-style-type: none"><li>– pulses represent an approximate determination of cardiac output</li><li>– at a minimum, the femoral and brachial pulses should be palpated bilaterally<ul style="list-style-type: none"><li>▪ then one femoral and the right brachial should be palpated simultaneously</li></ul></li></ul> |
| capillary refill | <ul style="list-style-type: none"><li>– <b>capillary filling time</b> can give valuable information about the infant's cardiac perfusion to the skin and should be determined by pressing a finger against the infant's skin in both a central and a peripheral area</li><li>– capillary refill should be brisk</li></ul>           |

## GENERAL APPEARANCE

- observation involves:
  - physical maturity
  - well-being of newborn
  - nutritional status
- in term infants there is **appropriate subcutaneous fat**
- in term infants the normal position is with the hips abducted and partially flexed, the knees flexed, and the arms adducted and flexed at the elbow - this position is similar to the **fetal position**
- the quality and quantity of **spontaneous movements** are observed
- a hungry, crying baby cannot be assessed accurately
- crying should be vigorous, but it should be possible to console the infant by cuddling

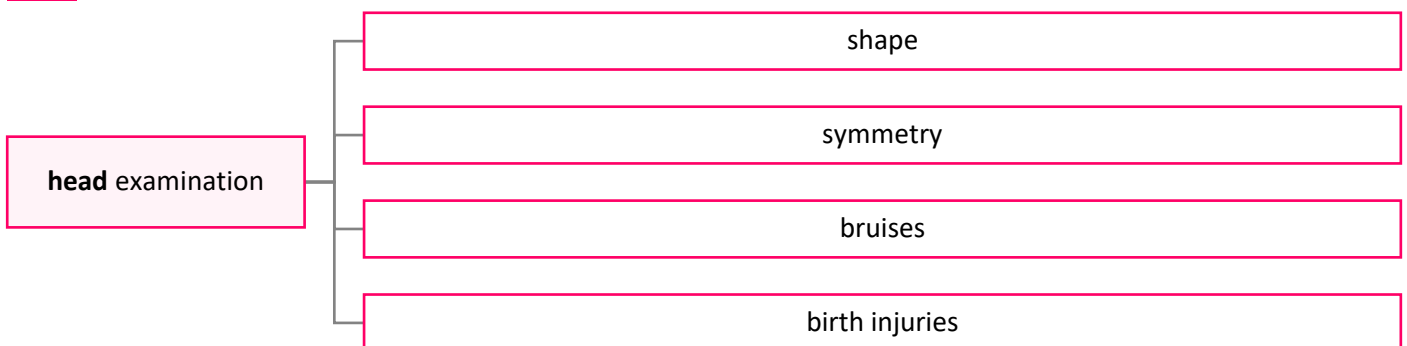
## SKIN



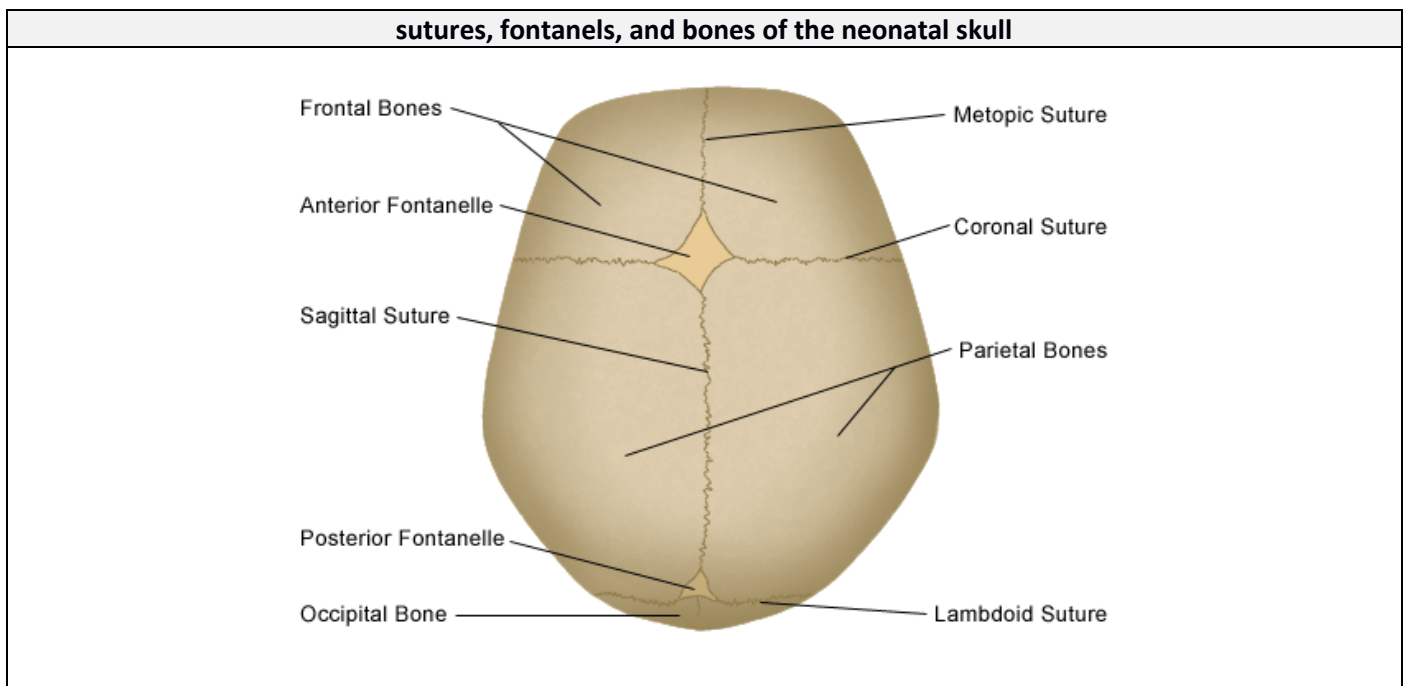
- you should note if any **cutaneous lesions** are present – you should describe its:
  - placement
  - size
  - classifications
- skin of term newborn is pink

- fetal skin is covered in utero with **vernix caseosa**, a greasy white or yellow material composed of sebaceous gland secretions, proteins, and exfoliated skin cells
  - vernix becomes thicker during the third trimester, it gradually decreases as the fetus approaches 40 weeks gestation
  - vernix is present more often in the axillae, the groin and on the back
- **lanugo** - the fetus is also covered with a fine, soft, and downy type of hair called lanugo while in utero.
  - lanugo first appears at approximately 20 weeks gestation and covers most of the body
  - most of it disappears between the 7th and 8th month of pregnancy
  - sometimes may be present in term newborns – then it disappears within a couple of next days or weeks after the birth

## HEAD



- term newborn infants born by vaginal delivery often present elongated skull shape with overlapping skull bones
- the average **occipital-frontal circumference** at 40 weeks gestational age is **34-35 cm** (should be plotted on a standard growth chart and the gestation-specific percentile in which the measurement falls noted)



|                    |                                                                                                                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| palpation          | areas of soft or thinning bone                                                                                                                                                                                                                                |
|                    | shape, placement and size of fontanels                                                                                                                                                                                                                        |
|                    | shape, placement of sutures                                                                                                                                                                                                                                   |
|                    | evidence of birth trauma and other abnormalities                                                                                                                                                                                                              |
| anterior fontanel  | <ul style="list-style-type: none"> <li>– is diamond shaped</li> <li>– is normally described as flat and soft</li> <li>– <b>a tense or bulging fontanel</b> may be a sign of increased intracranial pressure or may occur when the infant is crying</li> </ul> |
| posterior fontanel | <ul style="list-style-type: none"> <li>– triangular in form</li> <li>– often difficult to palpate directly after the birth</li> </ul>                                                                                                                         |

## FACE, NECK AND CLAVICLES

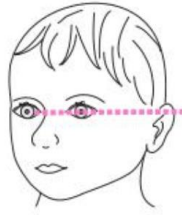
|                           |                     |
|---------------------------|---------------------|
| face and neck examination | shape               |
|                           | symmetry            |
|                           | bruises             |
|                           | other abnormalities |

- examine **reflexes: suck and rooting**
- palpate the entire length of the **clavicles** - suspect fracture if crepitus, swelling, or tenderness is present.

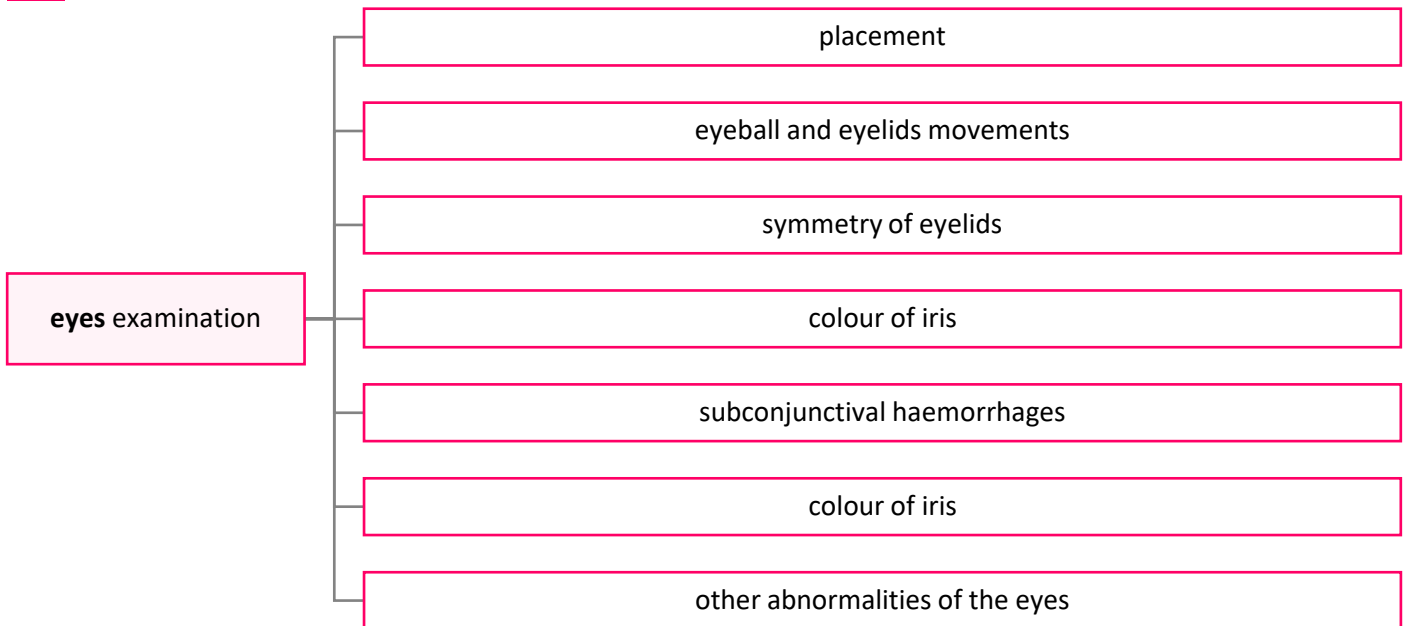
## EARS

|                 |                          |
|-----------------|--------------------------|
| ear examination | shape                    |
|                 | formation                |
|                 | position                 |
|                 | malformations of the ear |
|                 | birth injuries           |

- the ear should be inspected visually to assess the presence and patency of the **auditory canal**
- the top of the pinna should be at or above a horizontal line from the inner and outer canthi of the eye

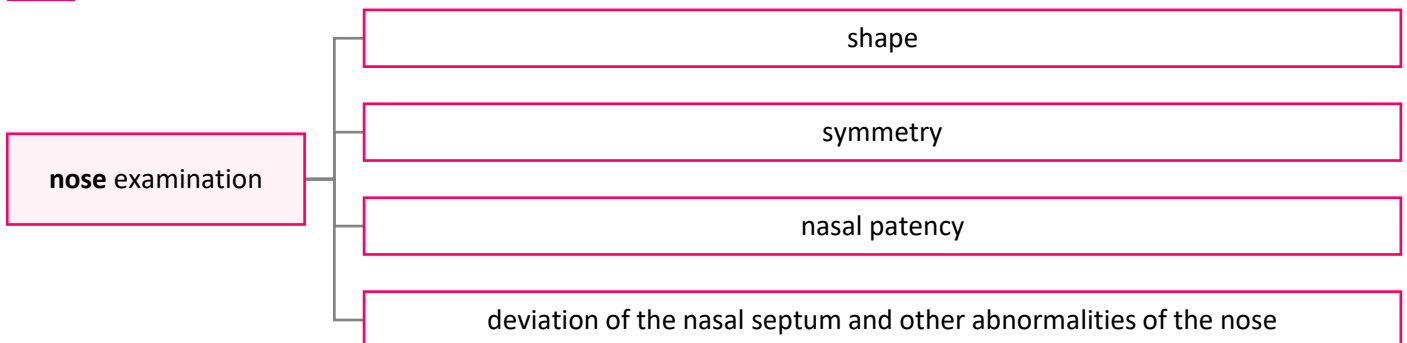


## EYES



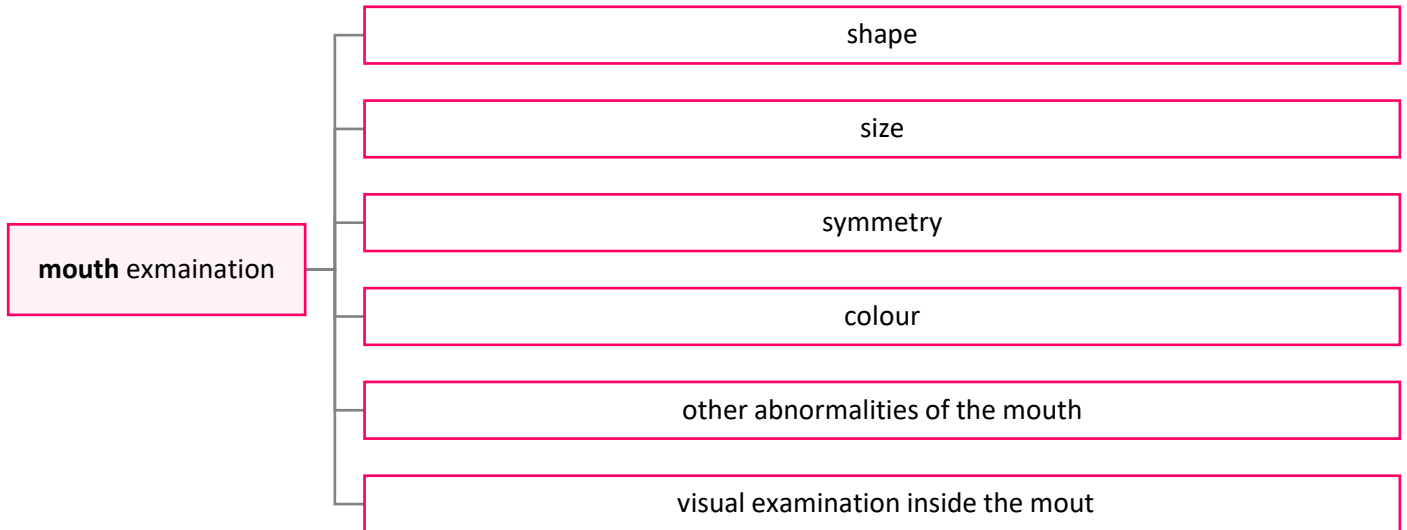
- the iris of a newborn infant is generally dark gray, blue, or brown at birth and will acquire final pigment color at about 6 months of age
- **mild lid oedema** may be present (especially following a long labour) – it can last up to 2 days after the birth

## NOSE



- deviation of the nasal septum to one side may be a deformation from position in utero, or can appear during labour – it may last up for a couple of days

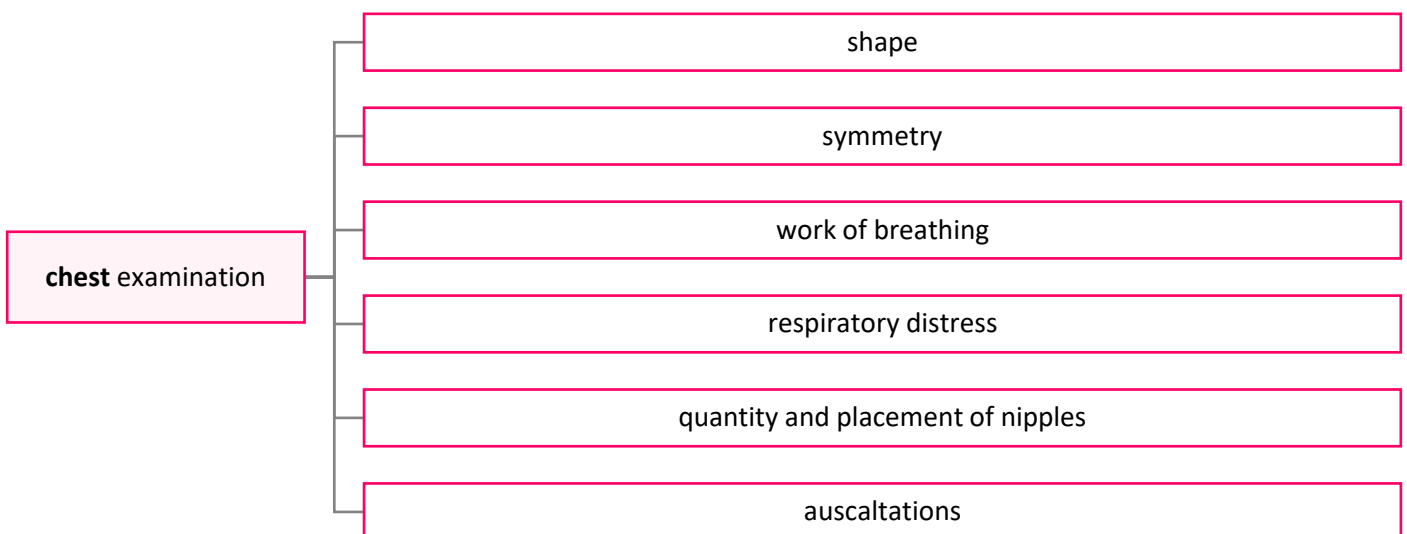
## MOUTH



- examine the **mucous membranes**:
  - colour
  - wilgotność
  - the quantity and quality of oral secretions
- examine **palate**
  - **a submucosal cleft palate** can only be diagnosed by inserting a clean finger into the mouth to feel for a mucous membrane-covered bony cleft.
  - **Epstein's pearls** (small inclusion cysts in the midline of the hard palate) are normal and eventually disappear.
- **the frenulum (frenulum linguae)** attaches the underside of the tongue to the floor of the mouth, usually midway between the tongue's ventral surface and tip
  - if the frenulum limits movement of the tongue or pulls the tongue to a "V" at the tip, it is abnormal and may limit suck effectiveness primarily for breastfeeding

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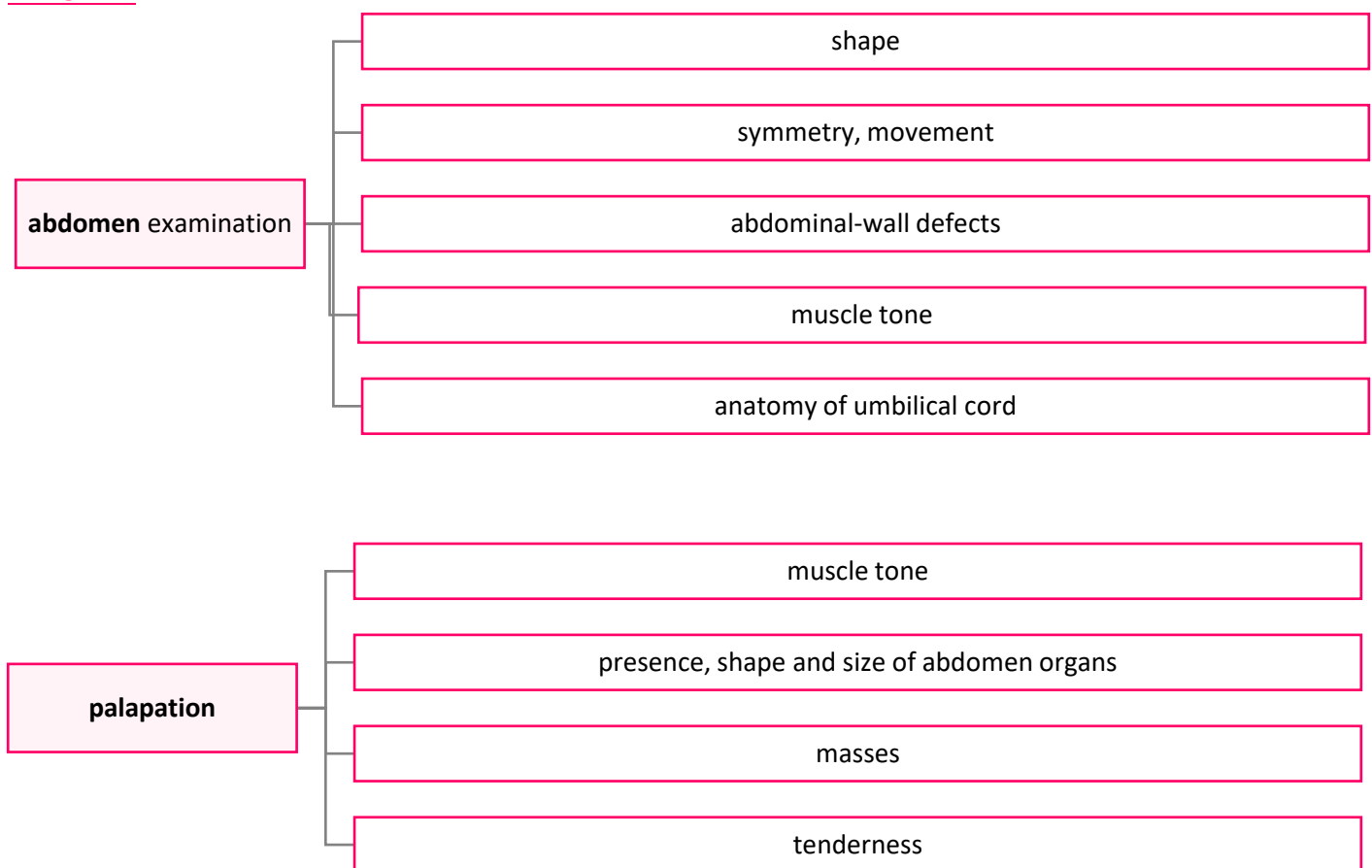
## CHEST



- in term infants, the average **chest circumference** is approximately 1-2 cm smaller than the head circumference

- **work of breathing**
  - during normal respiratory efforts in the neonate, the lower thorax pulls in, and the abdomen bulges with each respiration
- **breast tissue**
  - as indicated in the discussion of inspection, the **breast buds** should be gently palpated to determine the presence of hypertrophy, fissures, secretions, or masses
  - **breast engorgement** occurs commonly in both sexes and is due to maternal oestrogen effect
- **auscultations**
  - normal breath sounds, adventitious sounds
  - heart rate, cardiac rhythm and regularity, heart sounds, murmurs

## ABDOMEN



|                       |                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>bowel sounds</b>   | <ul style="list-style-type: none"> <li>– bowel sounds will be audible beginning about 15 minutes after birth</li> <li>– they are relatively quiet until feedings have begun</li> <li>– premature infants may have hypoactive bowel sounds</li> </ul>                                                                                                                                  |
| <b>umbilical cord</b> | <ul style="list-style-type: none"> <li>– count the vessels - it contains two arteries and one vein'Redness encircling the cord and extending onto the abdomen can be a sign of omphalitis (infection of the umbilical cord)</li> <li>– any unusual bulging or herniation in the cord requires further investigation and could indicate the presence of a small omphalocele</li> </ul> |
| <b>liver</b>          | – normally palpable up to 1-2 cm below the costal margin                                                                                                                                                                                                                                                                                                                              |
| <b>spleen</b>         | – the tip can be palpated in about a quarter of normal infants                                                                                                                                                                                                                                                                                                                        |

## GENITOURINARY ASSESSMENT

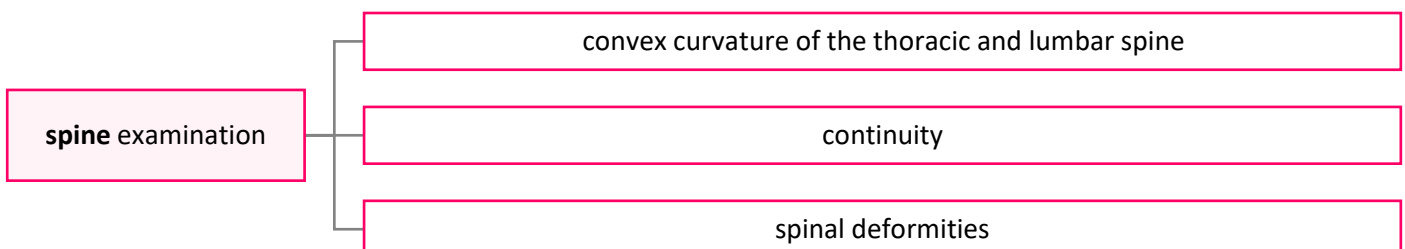
- gestational age has a great impact on the appearance of external genitalia

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>male genitalia</b>   | <ul style="list-style-type: none"> <li>– the average stretched length of the penis in a term newborn is <b><u>2,5-3,5 cm</u></b></li> <li>– the urethral meatus normally opens at the tip of the glans penis</li> <li>– <b><u>physiologic phimosis</u></b>, the inability to retract the foreskin, is normal in newborns</li> <li>– testes <ul style="list-style-type: none"> <li>▪ should be well situated in the scrotum.</li> </ul> </li> </ul> <p>when palpated, normal testes are firm and smooth and comparatively equal in size</p> <ul style="list-style-type: none"> <li>▪ they are ovoid in shape, usually mobile, and measure, on average, 1.4 to 1.6 cm in the term newborn</li> <li>– <b><u>at 28 to 30 weeks</u></b>, they begin to descend into the inguinal canal</li> <li>– scrotum <ul style="list-style-type: none"> <li>▪ <b><u>rugae</u></b> (wrinkles or creases) begin to form on the ventral surface of the scrotum at approximately 36 weeks gestation</li> <li>▪ at term, the scrotum is fully rugated and more deeply pigmented than surrounding skin</li> </ul> </li> </ul> |
| <b>female genitalia</b> | <ul style="list-style-type: none"> <li>– directly below the clitoris and above the vaginal opening is the urethral meatus</li> <li>– maternal hormone exposure can stimulate a white, <b><u>mucoïd vaginal discharge and/or bleeding (pseudomenses)</u></b> <ul style="list-style-type: none"> <li>▪ these findings may persist for up to 10 days</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

- **pink nappies**
  - occasionally, urates may react with the urine in the newborn period, leaving a pinkish-red stain on the napkin that may be confused with haematuria
  - this is self-limiting and only occurs in the first few weeks of life
- the genitalia may be edematous and ecchymotic for several days after delivery
  - can be caused by breech position or of the influence of maternal estrogen

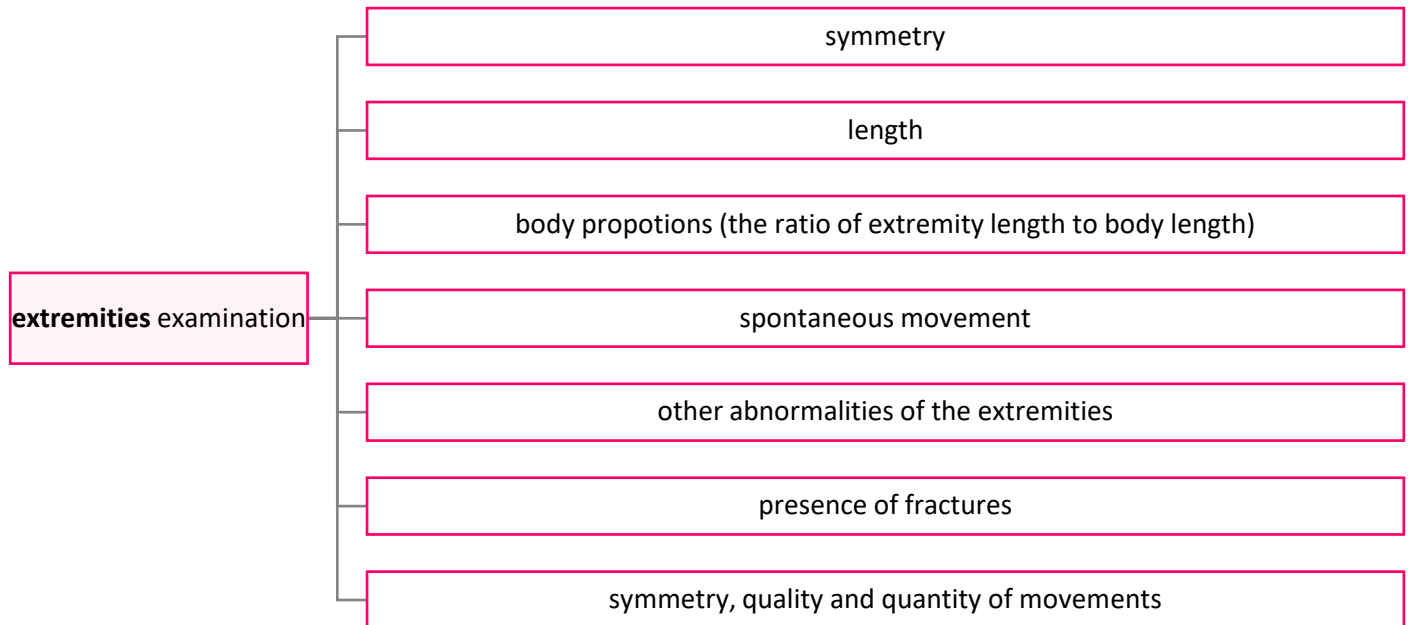
|                      |                                                                                                                                                                                                                                                                                                     |
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| <b>perianal area</b> | <p>should be inspected for:</p> <ul style="list-style-type: none"> <li>– presence and placement of an anus</li> <li>– for anal sphincter tone</li> <li>– for abnormalities such as fistulas</li> </ul>                                                                                              |
| <b>anus</b>          | <ul style="list-style-type: none"> <li>– check for normal position and patency</li> <li>– <b><u>always visualize the anus directly!</u></b> <ul style="list-style-type: none"> <li>▪ the meconium may have passed via the urethra or vagina due to the presence of a fistula</li> </ul> </li> </ul> |

## **BACK, EXTREMITIES, HIP**



- run your finger all the way down the **spine**, looking and feeling for any defects
- infant should lie in a symmetric position
- **inspect the spine** from the base of the skull to the coccyx

- noting any abnormalities (ex. skin disruption, tufts of hair, soft or cystic masses, hemangiomas, a pilonidal dimple, cysts, or sinus tracts)



- examination of the hip should start with observations for signs of established dislocation, such as:
  - unequal leg length
  - asymmetry of the thigh creases
- the **hand** should be examined for shape, size, and posture while the **fingers** are examined for number, shape, and length.
- **the nails are usually smooth and soft** and extend to the fingertips