

The new born and family

Adjustment to extra uterine life

Immediate new born and family

Adjustment to extra uterine life:

The most important physiological change required from the neonate after birth is the transition from

fetal/placental
circulation to
independent respiration.
The first 24 hours of life
are very critical because
respiratory distress or
circulatory failure can
occur rapidly with little
warning.

Changes in the various
organs/systems that
lead to the adjustment

to extra uterine life
include:

Respiratory system:

First respiration is
initiated by:

1. Chemical factors:
after clamping the
umbilical cord O_2
decrease, CO_2 increase
and PH decrease, these
changes in the blood
initiate impulses that

excite the respiratory center in the medulla.

2. Thermal stimulus:
this is due to sudden chilling of the infant after delivery the transfer from the warm uterus to the cooler atmosphere excite sensory impulses in the skin

that are transmitted to the respiratory center. What occurs during the first breath?

The air entering into the lungs with the first breath is faced with the surface tension of the fluid in the lungs & the alveoli, this fluid is absorbed via the lymphatic system &

pulmonary capillaries
and part of it is removed
by the labor force
If delivery was by
cesarean section the
lungs will not be
compressed to help in
removing the fluid
within them &
suctioning has to be
done.

The presence of surfactant helps in reducing the surface tension in the alveoli & without this substance the recoiling characteristic of the lungs will permit any air exchange to take place.

Circulatory system:

Initiation of respiration allows blood to flow

through the lungs
leading to changes in the
circulation which are
due to the changes in the
lungs, heart and major
blood vessels.

The changes are gradual
and include:

Closure of Foramen

Ovali (closes
functionally soon after
birth)

Closure of Ductus Arteriosus (closes functionally by 4th day of life)

Closure of Ductus Venosus, clamped (extension of the umbilical cord)

The expansion of the lungs causes the pulmonary vessels to dilate decreasing the

vascular resistance in the lungs so the pulmonary blood flow increase, so the pressure in the Rt atrium, Rt ventricle & pulmonary artery decrease.

The most important primary factor controlling ductal closure is *the high*

concentration of Oxygen
level in the blood.

Secondary factors are:
Decrease in endogenous
prostaglandin
and acidosis

Murmur may be present
because these changes
are gradual and cyanosis
may occur during crying
or straining

Physiological status of other systems:

Thermoregulation: It is very important after establishment of respiration, the newborn's heat production is adequate but there are factors that predispose to heat loss are:

Large surface area;
this is compensated
for by the flexed
position which is the
usual position of the
newborn

The thin layer of
subcutaneous fat

Hemopoietic system:

The blood volume
depends on the
time of clamping of

the umbilical cord,
which may increase
100 ml if it is closed
after the cessation
of pulsation in the
cord. Blood volume
in the full term
newborn is 80-
85ml/kg (total is
300ml)

Hemoglobin level
averages 17 to 18

g/100 mL of blood .
The Hematocrit is
between 45% and
50%.

Fluid & electrolyte
balance: at term total
body fluid is 73% (adult
58%). The infant has
higher ratio of extra
cellular fluid than the
adult and also higher
level of total body

sodium & chloride and lower level of potassium, magnesium & phosphate. The infant's rate of metabolism is twice as great in relation to body weight than the adult so twice as much acid is formed that may lead to acidosis.

Gastrointestinal system:

Enzymes are adequate
to handle proteins and
simple sugar

Deficient production of
pancreatic amylase
impairs utilization of
complex carbohydrate
also decreased lipase
limits absorption of fat
high saturated fatty
acids.

The Liver is the most immature organ in the gastrointestinal system, the reduction of Glucuronyl transferase affects the conjugation of bilirubin with Glucuronic acid which contribute to the physiologic jaundice of the newborn.

Deficient formation of plasma proteins causes edema

Prothrombin & other coagulation factors are low

Less amount of glycogen is stored leading to hypoglycemia which is prevented by early breast feeding

Saliva is produced adequately **by 2-3 months**

Stomach capacity is 90ml

The intestine is relatively longer with big number of secretory glands and large absorption surface.

The peristaltic waves are rapid in the

intestines but slow in the esophagus & with the relaxed cardiac sphincter regurgitation is common.

Progressive change in the stooling pattern is sign of properly functioning G I system

Meconium is passed

within the 1st 36 hours –

transitional stools 3rd

day after feeding then

milk stools 4th day

In breast fed infants

stools are yellow-golden

& frequent (6

times/day)

In formula fed infants

stools are pale yellow-

light brown firm

offensive (1-3 times /

day).

Renal system:

Concentration ability is diminished, total urine volume 200-300ml by 1st week.

Bladder volume is 15ml about 20 voiding/day.

Urine is colorless, odorless. Specific gravity: 1.020. The newborn should void within 1st 24hrs after birth.

Integumentary system:

- The epidermis & the dermis are loosely bound so blister will develop if the plaster tape is removed rapidly.
- Sebaceous glands are active during fetal life, vernex caseosa (white cheesy cream like substance) covers most

of the skin of the
newborn & mainly skin
folds

Plugging of the
sebaceous glands leads
to Milia; white spots
over the nose & chin

- Eccrine sweat glands
active & produce sweat
in response to heat or
emotional stimuli in the
newborn retention of
sweat leads to miliaria.

These glands start functioning at 34 weeks of gestation. The amount of sweat is used to assess pain in the newborn.

Apocrine glands are not active until puberty.

Musculoskeletal system:
It contains cartilage more than ossified bone.
The process of

ossification is rapid during infancy.

The muscular system is almost completely formed at birth & growth in muscles is by hypertrophy rather than hyperplasia of the cells

Neuromuscular System
Mature newborns demonstrate neuromuscular function

by moving their extremities, attempting to control head movement, exhibiting a strong cry, and demonstrating newborn reflexes.

Limpness (Flaccidity) or total absence of a muscular response to manipulation is never normal and suggests

narcosis, shock, or cerebral injury.

APPEARANCE OF A NEWBORN

Skin:

Color

Most term newborns have a ruddy complexion because of the increased concentration of red blood cells in blood vessels and a decrease

in the amount of subcutaneous fat, which makes the blood vessels more visible.

Cyanosis : Generalized mottling of the skin is common. Acrocyanosis is a normal phenomenon in the first 24 to 48 hours after birth;

Hyperbilirubinemia :
Hyperbilirubinemia

leads to jaundice, or yellowing of the skin.

This occurs on the second or third day of life in about 50% of all newborns, as a result of a breakdown of fetal red blood cells (physiologic jaundice).

If the level rises to more than 10 to 12 mg/100 mL, treatment is usually

considered

Phototherapy

Harlequin Sign :

Occasionally, because of immature circulation, a newborn who has been lying on his or her side appears red on the dependent side of the body and pale on the upper side.

Birthmarks

Mongolian Spots:

Mongolian spots are collections of pigment cells (melanocytes) that appear as gray patches across the sacrum or buttocks and possibly on the arms and legs

<http://www.nandanursingdiagnosislist.org/newborn-nursing-diagnosis/>

Vernix caseosa is :a

white, cream cheese—like substance that serves as a skin lubricant in utero.

Usually, it is noticeable on a term newborn's

skin, at least in the skin folds, at birth.

During the first bath of vernix is washed away , when the newborn's temp. stabilize.

Lanugo :is the fine, downy hair that covers a newborn's shoulders, back, and upper arms.

Desquamation : Within 24 hours after birth, the

skin of most newborns has become extremely dry. The dryness is particularly evident on the palms of the hands and soles of the feet.

Milia All newborn sebaceous glands are immature. At least one pin-point white papule (a plugged or unopened sebaceous gland) can be

found on the cheek or across the bridge of the nose of almost every newborn.

Head

A newborn's head appears disproportionately large because it is about one fourth of the total body length; The forehead of a

newborn is large and prominent.

Molding

The part of the infant's head that engaged the cervix (usually the vertex) molds to fit the cervix contours during labor.

The head will restore to its normal shape within a few days after birth.

Caput succedaneum is edema of the scalp at the presenting part of the head. It may involve wide areas of the head, or it may resemble a large egg. The edema, which crosses the suture lines, is gradually absorbed and disappears at about the

third day of life. It needs no treatment.

A cephalhematoma :a collection of blood between the periosteum of a skull bone and the bone itself, is caused by rupture of a periosteal capillary because of the pressure of birthg.

Swelling usually appears 24 hours afterbirth.

Nursing care of a newborn and family in the post-partal Period newborns are usually kept in either a birthing room or a transitional nursery for optimal safety in the first few hours of life.

* Initial Feeding * Bathing * Sleeping Position

* Diaper Area Care * Umbilical care

* Metabolic Screening Tests

* Vitamin K Administration *

Circumcision

Apgar score assessment of the new born

Thank you for listening