

PEDIATRIC PHYSIOLOG



Psycho-motor development

- Gross motor control
- Fine motor control
- Language
- Personal – social control

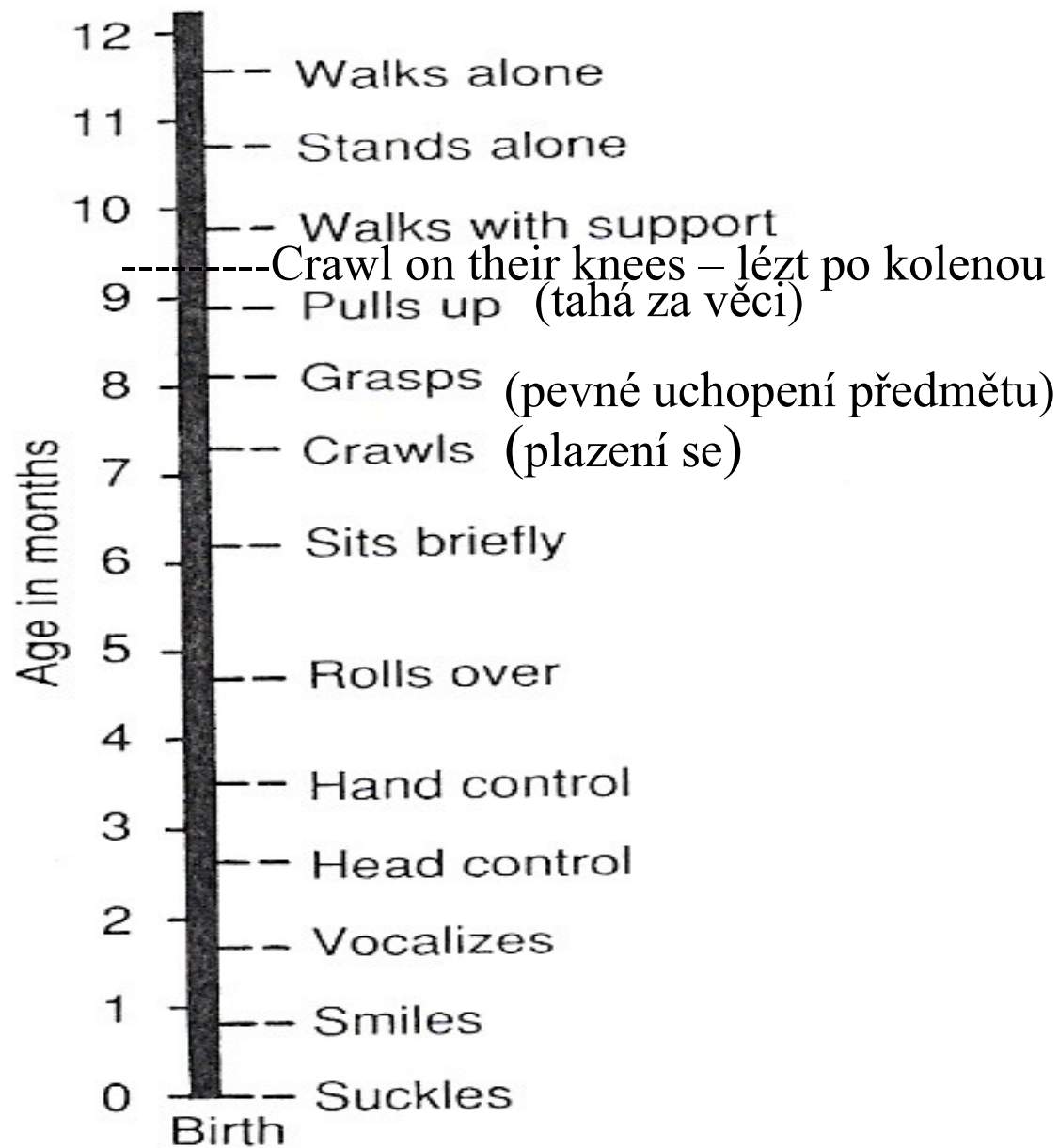


Figure 83–9. Behavioral development of the infant during the 1st year of life.

STRANGERS

RESISTS TOY PULL

50% PLAYS PEEK-A-BOO

WORKS FOR TOY OUT OF REACH

FEEDS SELF CRACKERS

NEAT PINCER GRASP OF RAISIN

BANGS 2 CUBES HELD IN HANDS

THUMB FINGER GRASP

RAKES RAISIN ATTAINS

SIT TAKES 2 CUBES

SIT LOOKS FOR YARN

PASSES CUBE HAND TO HAND

CHES OBJECT

TOWER OF 4 CUBES

SCRIBBLES SPONTANEOUSLY

DUMPS RAISIN FROM BOTTLE DEMONSTR.

TOWER OF 2 CUBES

OPPOS 2 OF 3

RECOGNIZES

COMPREHEN PREPOSITIO

COMPREHENDS COLD TIRED HUNGRY 2 OF 3

GIVES 1ST & LAST NAME

USES PLURALS

FOLLOWS DIRECTIONS 2 OF 3

NAMES 1 PICTURE

COMBINES 2 DIFFERENT WORDS

POINTS TO 1 NAMED BODY PART

BALANC 10 SECA

HEEL

HOPS ON

3 WORDS OTHER THAN MAMA, DADA

BALANCE ON 1 F 5 SECONDS 2 OF 3

DADA OR MAMA SPECIFIC

BROAD JUMP

IMITATES SPEECH SOUNDS

BALANCE ON 1 FOOT 1 SECOND 2 OF 3

DADA OR MAMA NONSPECIFIC

PEDALS TRICYCLE

URNS TO VOICE

JUMPS IN PLACE

THROWS BALL OVERHAND

KICKS BALL FORWARD

GROWTH PERIODS

- **INFANCY:**

- ✓ Newborn: 0 –28 days after born (1 month)

- ✓ Suckling: 2 – 12 month

- **EARLY CHILDHOOD**

- ✓ 1 – 4 years old

- ✓ (Toddler 1 –3 years old)

GROWTH PERIODS

- **LATE CHILDHOOD**

- ✓ 5 – 12 years old

- ✓ Other special terms:

- ✓ Pre-school period 5 – 7 years

- ✓ School period – younger, older

GROWTH PERIODS

- **ADOLESCENCE**

- ✓ 13 – 20 years old
- ✓ The other special terms:
 - ✓ Teenager -19 years
 - ✓ Pubertas 11-15 years

WEIGHT

- Weight loss in first few days : 5-10% of birthweight
- Return to birthweight: 7-10 days of age
- Double birthweight: 4-5 mo
- Triple birthweight: 1yr
- Quadruple birthweight: 2 yr

Examination of newborn at the delivery room

- Apgar score

Signs	Points		
	0	1	2
✓ Heart rate:	0	<100 /min	>100/min
✓ Respiration:	none	weak cry	vigorous cry
✓ Muscle tone			
reflex irritability:	none	some motion	cry, withdrawal
✓ Color of body:	blue	pink body, blue extremities	pink all over

TRANSITION FROM FETAL TO NEONATAL PHYSIOLOGY

- **Specialities of fetal circulation:**
 - ✓ **Placenta**, where deoxygenated blood becomes oxygenated
 - ✓ **1 Umbilical vein** – well-oxygenated blood
 - ✓ **2 Umbilical arteries** – deoxygenated blood
 - ✓ **Foramen ovale**
 - ✓ **Ductus arteriosus Botalli**
 - ✓ **Ductus venosus**

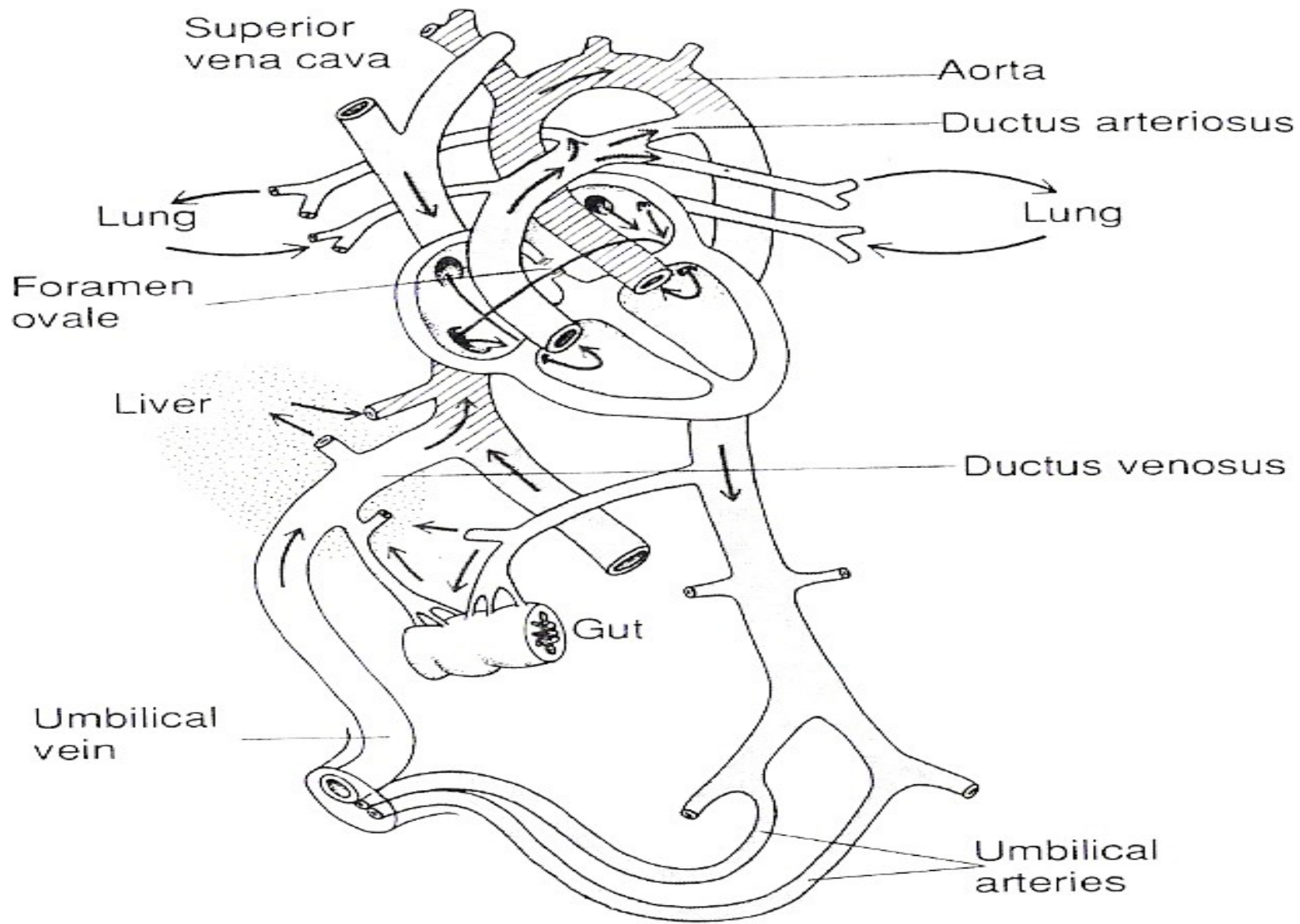


Figure 83-4. Organization of the fetal circulation. (Modified from Arey: *Developmental Anatomy*. 7th ed. Philadelphia, W. B. Saunders Company, 1974.)

TEMPERATURE

- **In utero** thermoregulation of the fetus is performed by the placenta, which is as an efficient heat exchanger
- **Fetal temperature** is higher than the mother's temperature: about 38.5 °C
- **After birth**, the newborn infant begins life covered by amniotic fluid and situated in a cold environment:
20-25 °C
- An infant's skin temperature may fall 0.3 °C/min and the core temperature may decline 0.1 °C/min in the delivery room

- Because the body surface area is large in relation to body mass, **heat is readily lost from the body**
- The ideal environmental temperature is called as **the neutral thermal environment**: the ambient temperature resulting in the lowest rate of heat production and the lowest consumption of oxygen by the infants while maintaining normal body temperature
- 1 hour after birth: 33-34 °C
- 1 day after birth: 31-33 °C
- 1 weeks after birth: 27-33 °C

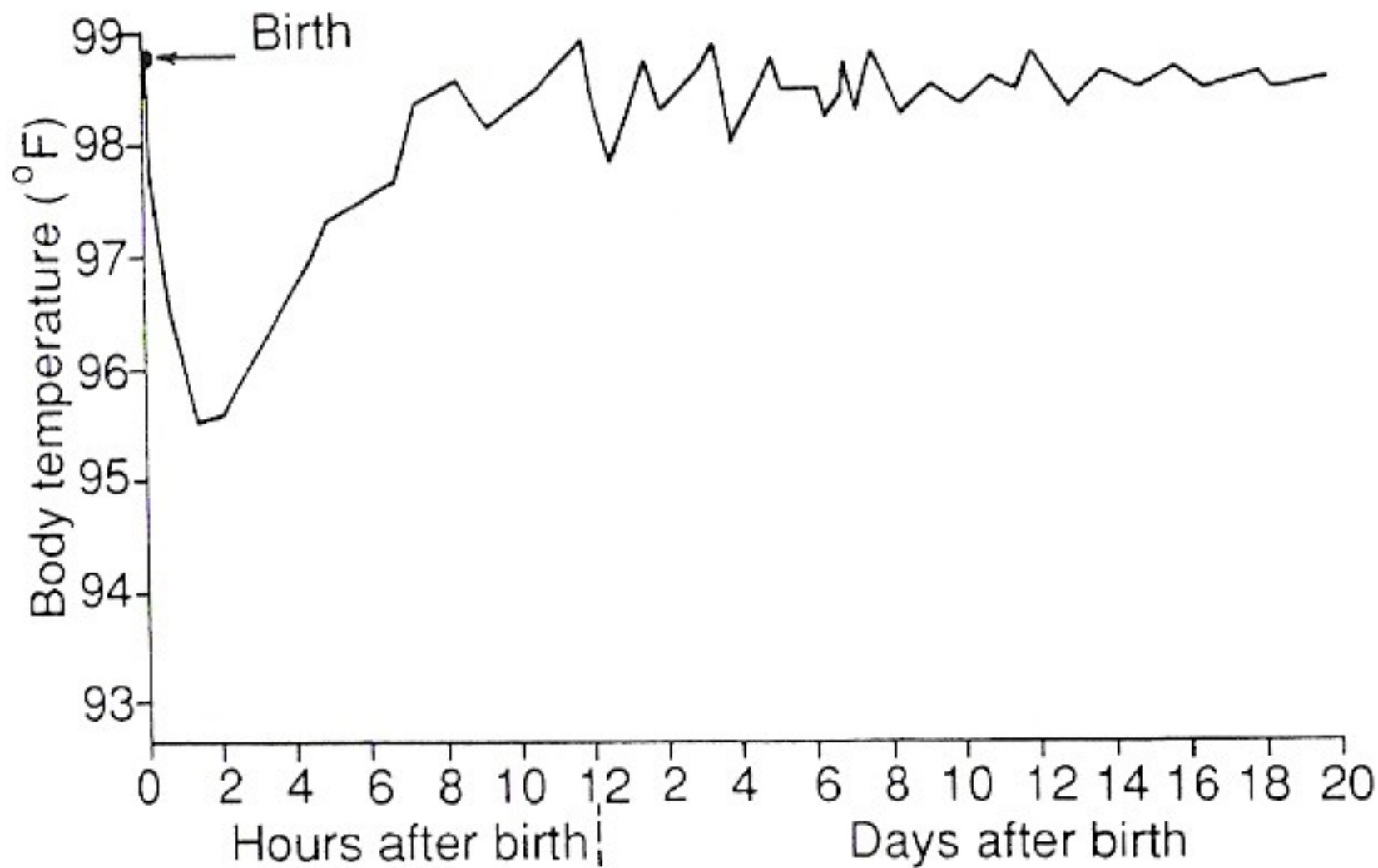
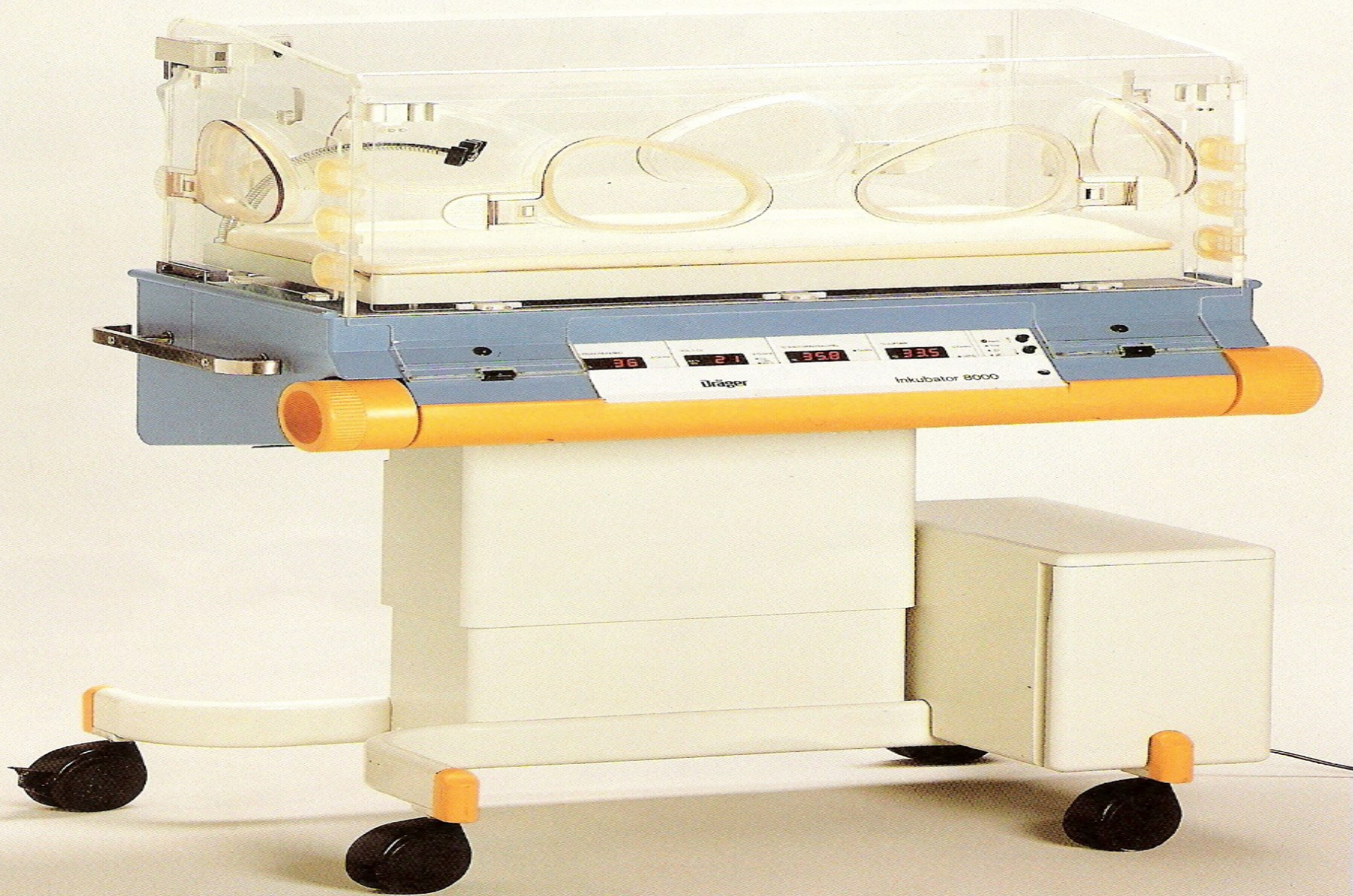


Figure 83-7. Fall in body temperature of the neonate immediately after birth, and instability of body temperature during the first few days of life.



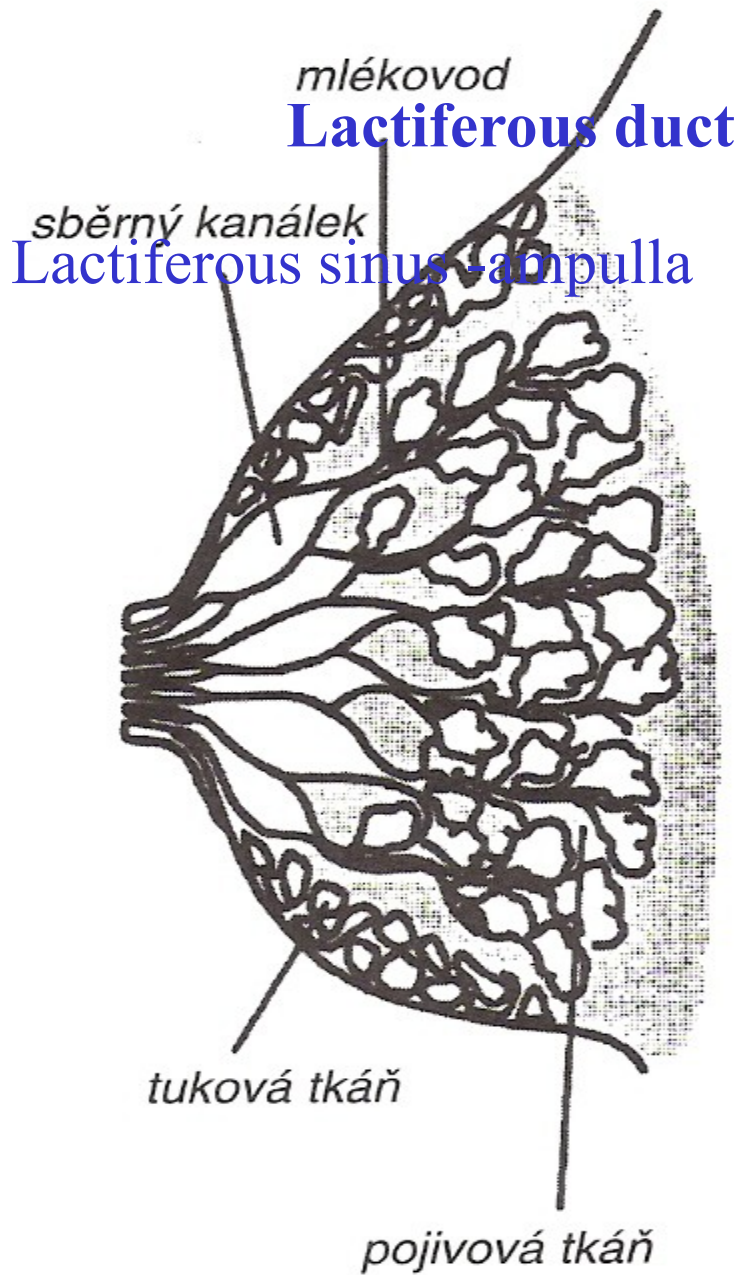
GIT and NUTRITION

- In general, the ability of the neonate to digest, absorb, and metabolize foods is not different that of the older child, with the following 3 exceptions:
 - ✓ 1. Secretion of pancreatic amylase is deficient
 - ✓ 2. Absorption of fats from the gastrointestinal tract is somewhat less than that in the older child (milk with a high fat content - such as cow's milk, is inadequately absorbed)
 - ✓ 3. The liver function during at least the 1st week of life, the glucose concentration in the blood is unstable and low

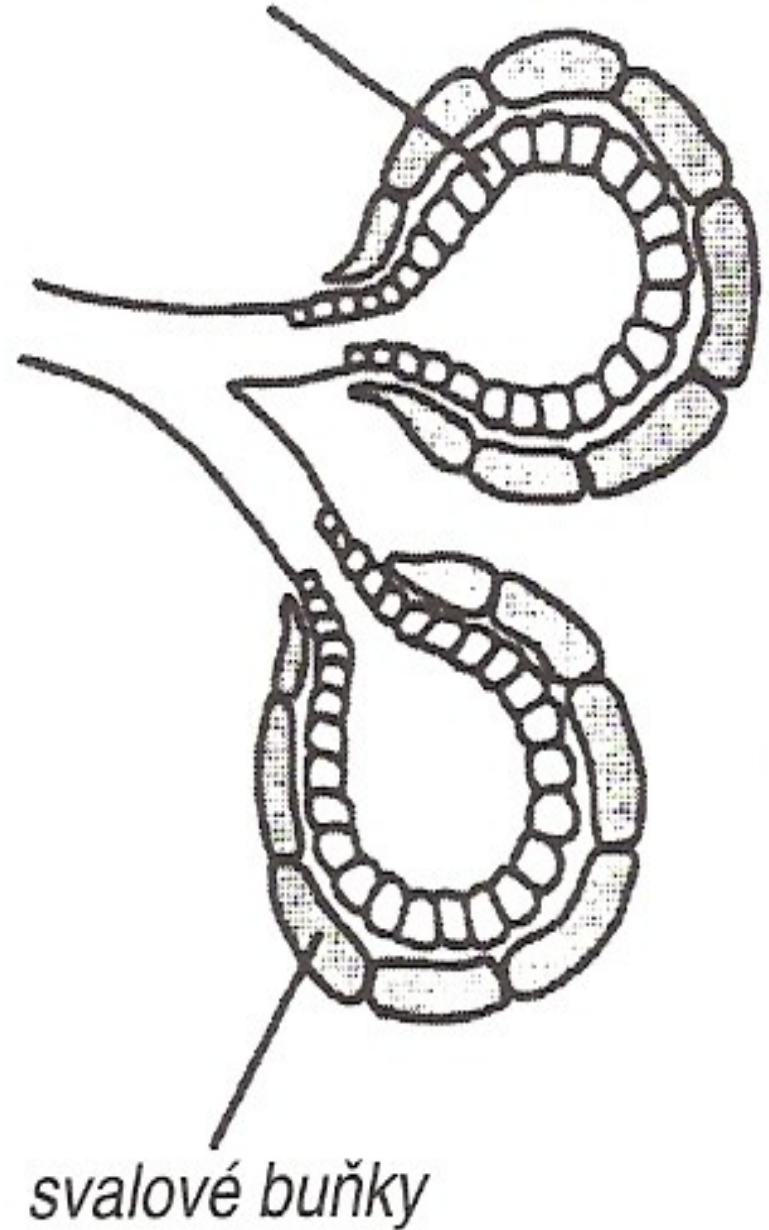
Nutritional needs during the early weeks of life

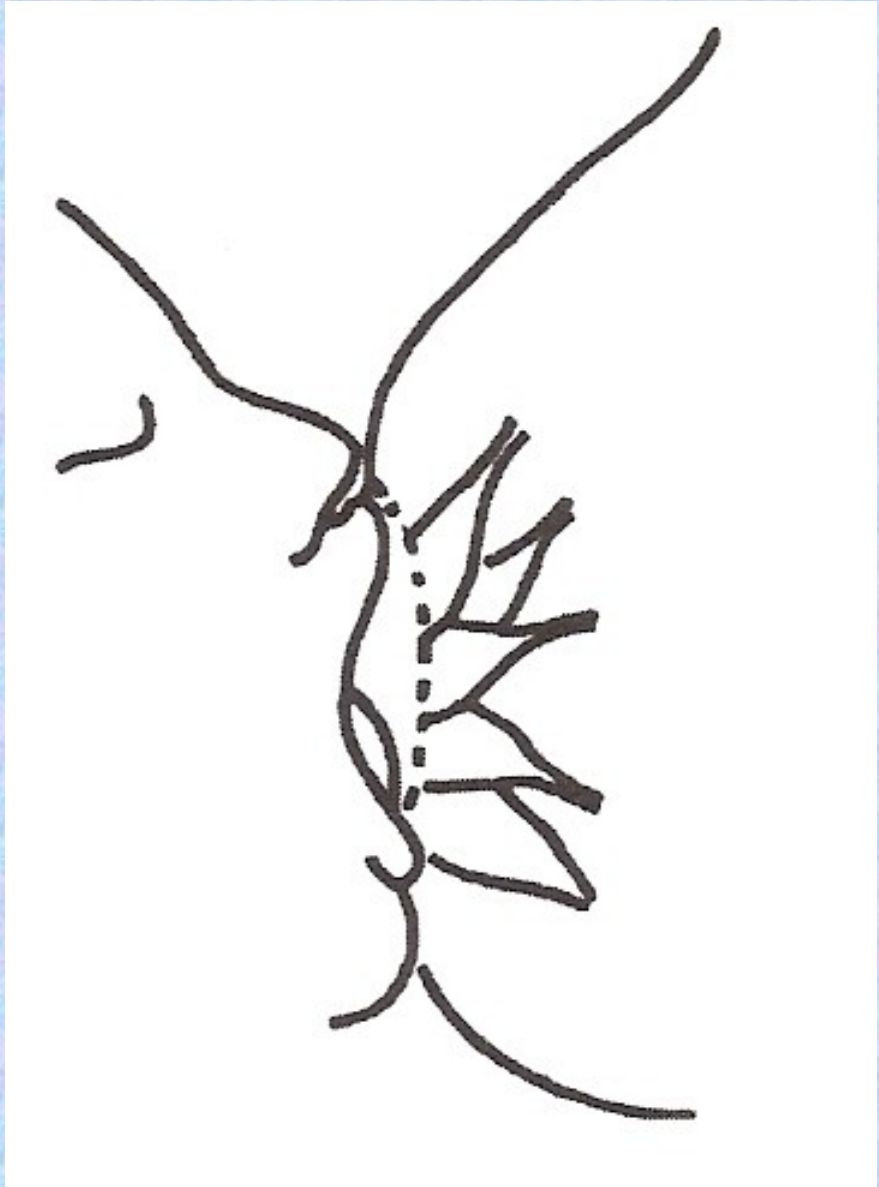
- Need for calcium and vitamin D
- Necessity for iron in the diet
- The correct and natural nutrition:
 - ✓ **breast milk** and is necessary **supported breast feeding**

The breast and its mammary gland



buňky produkující mléko





Period of non-milk additions in children nutrition: 5th – 7th month

- 5th month: vegetable soup – meat-vegetable supplement, boiled egg yolk 2/week (not eggwhite-albumen), vegetable oil 5-10g
- Replacement of breast milk (e.g. SUNAR, other products (Nutralon, Hipp...))
- 6th month: fruits-milk supplement , cottage cheese, yoghurt, mixed fruits, **sugar free**
- 7th month – cereals with gluten, pap, biscuits
- **milk period 0-6 month**
- **non-dairy period and transition period to a mix diet** (lunchtime is replaced with the soup)

transition period to a mix diet 8th – 12th month

- The same diet as in the previous slide
- + from 9th month – a piecemeal, grainy diet
- **important fiber** (fruit juices, juices, oat flakes ...)
 - increases the water content of the intestinal contents
 - slows the passage time through the intestines
 - has a beneficial effect on microbiology (microecology) in the large intestine
- fibrous indigestible material in vegetable foodstuffs that aids the passage of food has a good influence to intestine function

State screening for metabolic disorder in neonate

- **Congenital hypothyroidism:** usually arises as a sporadic mutation which causes an insufficient production of thyroxine
 - ✓ The expected incidence of the disorder is as 1: 5 000 births
 - ✓ The initial screening test is the thyroxine radioimmunoassay, which may be done on a heel stick blood spot at the first week after birth

- **Phenylketonuria (PKU)**

- ✓ the annual incidence of this inborn error of metabolism is 1:16 000 live births. If the condition is not detected and treated during the first few month of life, severe or profound mental retardation occurs
- ✓ Screening provide by Guthrie inhibition assey test – blood spots specimen obtained from a heel stick
- ✓ As soon PKU is detected, a low phenylalanine diet is begun