An Infant

By infant we mean a child from the 29th day of life to 1 year of age. The infant period therefore lasts 11 calendar months. This is a period of dramatic somatic, neuropsychic and motor development that symbolically culminates with the first step and the first word around one year of age. In terms of morbidity and mortality , it is the second most important period (right after the newborn period).[1]


An Infant

Development of motor skills

- the development of fine motor skills is characterized by the development of grip:
  - at 3–4 months – grip with the whole palm, especially the ulnar part;
  - before the 5th month – grasping with the thumb (e.g. when grasping a cube);
  - before the 7th month – opposition of the thumb (when grasping small objects);
  - at 9 months – tweezers (pincer) grip;
  - at 9-10 months begins to intentionally drop things;
- the development of gross motor skills makes it possible to explore the surroundings
  - at 6 months – independent sitting;
  - at 12 (9–17) months – the **beginnings of walking**.[2][3]
- laws of development according to **Arnold Gesell**:
  - **the principle of the direction of development** - *cephalocaudal* progression (first actively controls the head, then in passive sitting aligns first the cervical spine and then the lumbar spine, then climbs on the knees and stands on the feet), *proximodistal* progression (limb movements begin in the shoulder and hip joints, pass through the wrist to the fingers, or over the knees to the feet) and the *ulnoradial* progression (shift from the little finger side to the thumb side during an active grip);
  - **the principle of alternating „interweaving“** of antagonistic neuromotor functions (development along a spiral) – alternating dominance of flexors and extensors of the limbs;
  - **principle of functional asymmetry** – alternation of functional symmetry and asymmetry at an increasingly higher developmental level (symmetrical position of the limbs of a premature newborn, tonic cervical reflex of a full-term newborn, symmetrical position of the limbs after 3 months of age, grasping objects with one hand after 6 months of age);
  - **principle of individualization** – general principles of development apply, but with inter-individual differences;
  - **the principle of self-regulation** – development controlled by the child himself is not smooth, but with fluctuations.[3]
- at 8 months he can hold a bottle by himself while drinking and with help he drinks from a cup, holds and bites a roll or biscuit;
- in the first months of life, the infant's visual attention is mainly attracted by distinctive and colorful objects, while after the 9th month of age, on the contrary, details and small objects (a crumb, a pill, a chain, etc.);
- at 9 months he begins to understand simple calls - "tah tah", "baa-baa";
- at 1 year he distinguishes between objects according to their properties - squeezes a squeaky toy, pushes a toy car, puts a comb to his head;[3]

Psychosocial development in the 1st year of life

- crying is the main means of communication in the first weeks of life;
- time spent crying in the first 2-3 months of life increases as total daily sleep time decreases;
- after 12 weeks of age, crying decreases because the child learns to react differently - by smiling, touching, humming;
- average sleep time in the first year of life (1 week...1 month...1 year of age): 16...15...14 hours, of which 8...7...3 hours during the day;
- the infant perceives reality as equivalent to its immediate surroundings;
- the infant can follow the path of an object in the field of vision, but in the first six months the object ceases to exist for him as soon as it leaves the field of vision; only between 9.-12. by the month he begins to understand the permanence of objects;
- for 3-6 a month are typical simple games where the child and parent alternate moments of visual contact with moments of turning the face away - they represent an early stage of imitation;
- more complicated games (e.g. hide and seek) appear around 9 months; the expression of joy at a face that has disappeared and reappeared expresses an understanding of the object's permanence;
- between 8 and 9 months comes the fear of separation and fear of unknown people, the so-called **"separation anxiety"** - the child reacts to strangers by crying, it is an expression of recognition of the difference between

the mother's presence and absence (the child can evoke an image of her presence, becomes aware difference, becomes insecure and afraid); these manifestations peak around 15 months and disappear around 2 years of age.[2]

- ***Jean Piaget*** (1966) describes the first 2 years of life as **a sensorimotoric period** – the child learns to associate a stimulus from the environment with a motor response; it is based on simple reflective stereotypes (schemas) and supplements them with own experiences;
- ***Sigmund Freud*** calls the first year of life **oral stadium** – the child satisfies its needs through the mouth;
- ***Erik Homburger Erikson*** calls this the period **of primary trust or distrust**;[2]

- ***Margaret Mahler*** (1975) described the following stages:
  - 1st month of life – **the period of normal (primary) autism** – the child mostly sleeps, satisfies his needs, does not distinguish himself or his mother from the environment;
  - 2nd to 4th month - **the stage of symbiosis with the mother** - the mother satisfies all the needs of the child; permanent mutual bonds are formed; parents learn to perceive and recognize their child's expressions; mutual emotional interaction develops; the child does not distinguish itself from its mother, but begins to distinguish its surroundings;
  - 4th month to 3 years – **period of separation – individuation**:
    - 4th to 10th month - *differentiation subphase* - the child differentiates its mother from other people; explores surroundings, own body and mother's body; at the end of this period, separation anxiety is manifested;
    - 10 to 16 months - *subphase of practice* - the child begins to actively move away from the mother, but always returns to her to gain security and emotional reassurance, thereby strengthening his relationship with the mother; forced separation during this period can cause stagnation or even regression in the child's development;
    - 16th to 25th month – *the reunification subphase*, or the phase of establishing social relations;
    - 25th to 36th month – *subphase of individuation or object permanence*;[3]

Speech development

- up to 2 months – non-verbal phase;
- from 2 months – vocal play (between mother and child);
- 3 months - babbling; vowels a, u, e;
- 7 months – imitating speech sounds;
- 8 months – syllables da, ba, ka;
- 10 months - **"Dad" or "Mum" unaddressed**;
- 10th to 11th months - short "lines" that do not have a specific meaning, but have a clear form of message, question or order (by rhythm and melody of speech); around 1 year, this jargon has the character of long "speech", during which it is only rarely possible to catch a clear word;
- 12 months - own speech (jargon) that only parents understand - imitates physical sounds, animal voices or human screams; clearly articulates one other word besides "mom" and "dad";
- understanding of speech (passive vocabulary) develops faster than expressive ability (active vocabulary) - **they understand their first words at 9 months**[2][4]

Development of the central nervous system

- the ratio between head size and body length/height decreases – from 1/4 in a newborn to 1/8 in an adult;
- at birth, the circumference of the cerebral part of the head is 65% of the circumference of an adult;
- half of the postnatal brain growth is already completed at 1 year of age; after 2 years of age, head circumference increases by only 2 cm/year; by age 10, brain growth is almost complete;

- the human brain contains approximately *100 billion neurons*;
- neuronal replication takes place mainly during the first 3 months of pregnancy and is completed before birth;
- the organization of brain cells continues to develop long after birth;
- brain white matter increases and synaptic connections proliferate;
- the gray matter of the cerebellum develops relatively late (from the 30th week of pregnancy to 1 year of age);
- the spinal cord grows through the neural canal gradually until the 3rd month of pregnancy, then the body of the fetus grows faster than the spinal cord, so the lower pole of the spinal cord gradually rises; reaches the 3rd lumbar vertebra at birth;
- **myelination** begins in the spinal cord in the 4th month of pregnancy and in the brain in the last trimester; at birth, the maturation and myelination of the autonomic nervous system is completed, the cranial nerves are myelinated except for the optic and olfactory nerves; myelination of the cerebral cortex and its connections to the thalamus and basal ganglia ends around 2 years of age;

- **the Moro reflex** and **palmar grip** develop in the 28th week of pregnancy and gradually disappear in the 3rd and 3rd weeks, respectively. 4 months of age;
- **the Babinski reflex** appears just before the birth date and usually disappears after 12 to 16 months of age due to myelination. .[2]

Infantile growth period

- the infantile growth period is a direct postnatal continuation of intrauterine growth;
- growth during this period is not directly affected by the parents' height;
- at the beginning of postnatal life, the action of gonadotropins and sex hormones from the end of the fetal

period persists (the period after birth resembles the beginning of puberty);
- the effect of growth hormone on growth rate is just beginning to develop;
- only during the 2nd year of life does body growth begin to be influenced by growth hormone;
- in the first years of life, the need for energy decreases significantly: from 110 kcal/kg/day in early infancy to 90 kcal/kg/day at 2 years of age and subsequently 60 kcal/kg/day (basal metabolism + body movement + growth); it is caused by a reduction in the relative mass of energy-demanding organs (especially the brain and liver) from 17% of an infant's body weight to 5% of an adult's body weight;
- the percentage of energy used for growth also decreases: from 40% in early infancy to 3% at 2 years of age.[2]

ICP model according to Karlberg

- the first 3 years of life are a combination of the decelerating infantile growth component (I) and the emerging child growth component (C), which operates from the second half of the 1st year of life;
- the levels of gonadotropins and sex hormones activated in the late fetal period decrease;
- the influence of component I gradually disappears and then component C participates exclusively in growth.[2]

The most common problems in infancy

- congenital developmental defects ;
- late manifestations of the consequences of perinatal pathologies (for example, the development of cerebral palsy due to perinatal asphyxia);
- hereditary metabolic disorders;
- molecular endocrinological, immunological, hematological diseases, etc.;
- acquired diseases (especially infectious).[1]

Infant nutrition

🔎 *For more information see Breast-feeding, Artificial nutrition for infants, Non-dairy diet for infants.*

For a healthy, thriving infant, exclusive breastfeeding is recommended until the end of the 6th month (i.e. 26th week of life). Allergists recommend introducing non-dairy foods from the end of the 4th month, i.e. during the so-called "window of immunological tolerance" between the 4th and 6th months of age, while simultaneously breastfeeding. If the child thrives, it is recommended to continue breastfeeding with gradually introduced solid foods for 2 years or more[5]

Links

Related passwords

- Child age distribution: Newborn ■ Infant ■ Preschooler ■ Schoolboy ■ Adolescent
- Psychomotor development of the child ■ Neuromotor development of the child ■ Psychosocial development of the child ■ Child growth and development
- Child Nutrition: Recommendations for infant feeding 2011

References

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2. LEBL, Jan – PROVAZNÍK, Kamil – HEJCMANOVÁ, Ludmila. *Preclinic pediatrics.* 2. edition. Galén, 2007. pp. 48-71. ISBN 978-80-7262-438-6.
3. LANGMEIER, Josef – KREJČÍŘOVÁ, Dana. *Developmental Psychology.* 2. edition. Grada Publishing, 2006. 368 pp. pp. 32-47. ISBN 978-80-247-1284-0.
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5. Pediatric Gastroenterology and Nutrition Working Group. Recommendations of the CPS gastroenterology and nutrition working group for the nutrition of infants and toddlers. *Czech-Slovak pediatrics.* 2014, y. -, vol. duben, p. 10-13, ISSN 0069-2328.

External links

- Infant (https://cs.wikipedia.org/wiki/Kojenec) (Czech wikipedia)
- Infant (English wikipedia)