1. Terminology:
- Embryonic period;
  First 8 weeks of gestational age (GA)
- Fetus;
  9 weeks of GA until birth
- Neonate; age 1-28 days
- Infant; age under 1 year
- Childhood; age 1-14 year
- Premature baby;
  birth weight < 2500 gm. or GA < 37 wks
- Postmature baby;
  GA > 42 wks
- Immature baby;
  birth weight < 1000 gm.
- Term pregnancy;
- Dead fetus in utero;
  เด็กตายในท้อง, detect ได้ก่อนคลอด
- Intrapartum death;
  ตายระหว่างคลอด
- Still birth;
  เด็กคลอดออกมาไม่มี vital signs
- Perinatal death;
  neonatal death + fetal death

**TABLE 10-1 Cause of Death Related with Age**

<table>
<thead>
<tr>
<th>Causes</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 1 Year: All Causes</td>
<td>727.4</td>
</tr>
<tr>
<td>Congenital malformations, deformations, and</td>
<td></td>
</tr>
<tr>
<td>chromosomal anomalies</td>
<td></td>
</tr>
<tr>
<td>Disorders related to short gestation and low birth weight</td>
<td></td>
</tr>
<tr>
<td>Sudden infant death syndrome (SIDS)</td>
<td></td>
</tr>
<tr>
<td>Newborn affected by maternal complications of</td>
<td></td>
</tr>
<tr>
<td>pregnancy</td>
<td></td>
</tr>
<tr>
<td>Newborn affected by complications of placenta, cord, and membranes</td>
<td></td>
</tr>
<tr>
<td>Respiratory distress of newborn</td>
<td></td>
</tr>
<tr>
<td>Accidents (unintentional injuries)</td>
<td></td>
</tr>
<tr>
<td>Bacterial sepsis of newborn</td>
<td></td>
</tr>
<tr>
<td>Intrauterine hypoxia and birth asphyxia</td>
<td></td>
</tr>
<tr>
<td>Diseases of the circulatory system</td>
<td></td>
</tr>
</tbody>
</table>
2. Congenital Anomalies

- Definition: morphologic defects that are present at birth, but some have clinically apparent until years later (cardiac defects, renal anomalies).

- Major anomaly: anomaly having either cosmetic or functional significance.

Terms used for various kinds of errors in morphogenesis:
- Malformations
- Disruptions
- Deformations
- Sequence
- Syndrome
- Others: agenesis, aplasia, atresia, hypoplasia, hyperplasia, hypertrophy, hypotrophy, dysplasia

Malformations

- Primary errors of morphogenesis
- Intrinsically abnormal developmental process
- Usually multifactorial factors
- May involve single or multiple organ systems
- Such as: congenital heart defects, anencephaly, agenesis of corpus callosum
Disruptions

- Result from secondary destruction of an organ or body region that was previously normal in development.
- May be due to either external or internal interferences in morphogenesis
- Classic example; amniotic bands
- Not heritable and not associated with risk of recurrence in subsequent pregnancies.

Deformations

- Pathogenesis; localized or generalized compression of the growing fetus by abnormal biomechanical forces, leading eventually to a variety of structural abnormalities.
- Extrinsic disturbance of development more than intrinsic error

Deformation

- Most common underlying factor; uterine constraint
- Maternal factors; first pregnancy, small uterus, malformed uterus, leiomyomas
- Fetal factors; oligohydramnios, multiple fetuses, abnormal fetal presentation.
- Such as; clubfeet, Potter sequence

Club feet
Sequence

• A series of multiple congenital anomalies resulting from a single localized aberration in organogenesis with secondary effects on other organs.

• The primary abnormality may be a malformation, deformation, or disruption.

• Such as; renal agenesis or amniotic leakage
  → Oligohydramnios or Potter sequence:
    - flattened facies
    - positional abnormalities of hands and foot
    - lung hypoplasia
    - amnion nodosum

Amnion nodosum; nodules that consist of stratified squamous epithelium.

Syndrome

• Several defects that cannot be readily explained on the basis of a single, localized initiating anomaly.

• Most often caused by a single etiologic agent; viral infection or specific chromosomal abnormality.
Agenesis;  
- complete absence of an organ and its associated primordium.

Aplasia;  
- absence of an organ due to failure of the developmental anlage

Atresia;  
- absence of an opening, usually of a hollow visceral organ; trachea, intestine.

Hypoplasia;  
- incomplete development or underdevelopment of an organ with decreased numbers of cells.

Hyperplasia;  
- overdevelopment of an organ associated with increased numbers of cells

Hypothyrophy;  
- decrease in organ size or function related to a decrease in cell size

Hypertrophy;  
- increase in organ size or function related to a increase in cell size

Dysplasia;  
- in context of malformations, describes an abnormal organization of cells

**Causes of Congenital anomalies**

- Genetic Causes
- Environmental Causes
- Multifactorial Causes

**Genetic causes**

- **Karyotypic abnormalities**;
  - 10-15% of live-born infants with congenital abnormalities
  - most cytogenetic aberrations arise as defects in gametogenesis
    - Trisomy 21,
    - Klinefelter syndrome (47,XXY),
    - Turner syndrome (45, XO),
    - Patau syndrome (trisomy 13)

Trisomy 18  
(Edward syndrome), Clench hand
Trisomy 13
(Patau syndrome)

Turner syndrome (45,XO)

• Single gene mutations;
  - relatively uncommon but follow mendelian patterns of inheritance
  - holoprocencephaly, syndactyly, polydactyly

Holoprocencephaly
(severe alobar form)

• Multifactorial inheritance;
  - two or more genes of small effect with environmental factors.
  - such as; cleft lip and palate, neural tube defects, and congenital hip dislocation.

Syndactyly
Environmental causes

- **Viruses;**  
  - *rubella, cytomegalic inclusion disease,* HSV, VZV, influenza, mumps, HIV, enterovirus  
  - with all viruses, the GA at which the infection occurs in the mother is critically important.

**Rubella:**
- The at-risk period for rubella infection extends from shortly before conception to the 16th week of gestation.
- The hazard being greater in the first 8 weeks than in the second 8 weeks.
- The incidence of malformations is reduced from 50% to 20% to 7% if infection occurs in the 1st, 2nd, or 3rd month of gestation.

**Rubella embryopathy:**
- major tetrad comprises  
  - cataracts  
  - heart defects (persistent ductus arteriosus, pulmonary artery hypoplasia or stenosis, ventricular septal defect, tetralogy of Fallot)  
  - deafness  
  - mental retardation

**Intrauterine cytomegalovirus infection:**
- is the most common fetal viral infection  
- the highest at-risk period is the second trimester of pregnancy.  
- involvement of the central nervous system is a major feature; mental retardation, microcephaly, deafness, and hepatosplenomegaly
- **Drugs and other chemicals:**
  - teratogenic agents;
  - thalidomide, folate antagonists, androgenic hormones, alcohol, anticonvulsants, warfarin, 13-cis-retinoic acid

- **Fetal alcohol syndrome:**
  - growth retardation
  - microcephaly
  - atrial septal defect
  - short palpebral fissures
  - maxillary hypoplasia

- **Cigarette smoking:**
  - has not been convincingly demonstrated to be a teratogen
  - high incidence of spontaneous abortions, premature labor, placental abnormalities
  - low birth weight, may be prone to sudden infant death syndrome

- **Radiation:**
  - Radiation is mutagenic, carcinogenic, and teratogenic
  - Exposure to heavy doses during organogenesis can result in such defects as microcephaly, blindness, skull defects and spina bifida

- **Maternal diabetes:**
  - maternal hyperglycemia-induced fetal hyperinsulinemia causes increased body fat, muscle mass and organomegaly, cardiac anomalies, neural tube defects and other CNS malformations.

3. **Birth weight and gestational age**

**BIRTH WEIGHT**

- Appropriate for gestational age (AGA); 10th to 90th percentiles
- Small for gestational age (SGA); below 10th percentiles
- Large for gestational age (LGA); above 90th percentiles
**Prematurity**

- Birth before 37 weeks of gestational age
- Second most common cause of neonatal mortality

**Risk for prematurity**
- 30-40%; Premature rupture of placental membrane (PROM)
- 25%; Intrauterine infection, chorioamnionitis, funisitis; *Ureaplasma urealyticum*, *Mycoplasma hominis*, *Gardnerella vaginalis*, *Trichomonas*, gonorrhea, *Chlamydia*
  - Uterine or placental structural abnormalities
  - Multiple gestation (twin pregnancy)

**Complication of prematurity**
- Hyaline membrane disease (respiratory distress syndrome)
- Necrotizing enterocolitis (NEC)
- Sepsis
- Intraventricular hemorrhage (germinal matrix hemorrhage)
- Developmental delay

**Fetal growth restriction (FGR)**

- Small for gestational age
- Three main factors:
  1. Fetal
  2. Placental
  3. Maternal (most common)

**Fetal:**
- Chromosomal disorders; trisomy 13,18,21
- Congenital anomalies
- Congenital infections; *TORCH group*
  - *Toxoplasmosis*, *rubella*, *cytomegalovirus*, *herpesvirus*, other viruses or bacteria e.g. syphilis

**Placental:**
- Abruptio placentae
- Placenta previa
- Placental thrombosis and infarctions
- Placental infections
- Umbilical-placental vascular anomalies
- Multiple gestations
Abruptio placenta

Maternal:
- underlying mechanism is decreased blood flow to the placenta
- causative factors: toxemia of pregnancy, hypertension, nutritional status, narcotic or alcohol intake, heavy cigarette smoking, drugs

APGAR SCORE:
- A measure of the physiologic condition and responsiveness of the newborn infant
- Evaluated at 1, 5 and 10 minutes
- Predict perinatal morbidity and mortality
- The higher the score, the better the outlook

<table>
<thead>
<tr>
<th>Sign</th>
<th>0</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>A : Appearance (color)</td>
<td>Blue, pale</td>
<td>Body pink, extremities blue</td>
<td>Completely pink</td>
</tr>
<tr>
<td>P : Pulse (heart rate)</td>
<td>Absent</td>
<td>&lt;100/min</td>
<td>&gt;100/min</td>
</tr>
<tr>
<td>G : Grimace (response to catheter in nostril)</td>
<td>No response</td>
<td>Grimace</td>
<td>Cough or sneeze</td>
</tr>
<tr>
<td>A : Activity (muscle tone)</td>
<td>Limp</td>
<td>Some flexion of extremities</td>
<td>Active motion</td>
</tr>
<tr>
<td>R : Respiration</td>
<td>Absent</td>
<td>Slow, irregular</td>
<td>Good, crying</td>
</tr>
</tbody>
</table>

- 10 → infant in best possible condition
- 5-minute APGAR score
  - 0-1 → 50% mortality rate
  - 2-4 → 20% mortality rate
  - >7 → 0% mortality rate
4. BIRTH INJURY

**Intracranial hemorrhage**
- Most common important birth injury
- Related excessive molding of head or sudden pressure change
- Predisposing factors
  - Prolonged labor
  - Hypoxia
  - Hemorrhagic disorder
  - Intracranial vascular anomalies

**Caput succedaneum & Cephalhematoma**
- Caput succedaneum
  - Accumulation of interstitial fluid in the soft tissue of the scalp
- Cephalhematoma
  - Hemorrhage in the subperiosteal tissue
  - 25% associate with skull fracture

**Cerebral palsy (CP)**
- Cerebral Palsy is caused by damage to the developing brain, usually occurring before, during or shortly after birth.
- Brain damage can also occur during infancy due to infection or trauma.

**Perinatal Asphyxia**
- Severe hypotensive or hypovolemic event which the fetus suffer, usually around the time of birth
- Disruption of oxygen delivery to the fetus can originate in:
  - Umbilical cord → knot or prolapse of the cord
  - Placenta → abruption
  - Mother systemic circulation → preeclampsia
  - Obstetrical → difficult delivery
Multiple organ are affected
  1. Widespread marked congestion and hemorrhage
  2. Ischemic necrosis of various organs

5. Perinatal infections

Transcervical (Ascending) infections;
- Cervicovaginal route
- Most bacteria and some virus
  - Herpes simplex virus type II
  - *Escherichia coli*
  - Group B Streptococcus (GBS)
- Chorioamnionitis, funisitis
- Most common sequenae; pneumonia, sepsis, meningitis

**Group B Streptococcus**
- Most common cause of neonatal sepsis
- Early onset → usually occur within the first few hours after delivery
  → Pneumonia
  → Respiratory distress syndrome
  → Shock
- The mortality averages ~ 50%
- Death : within 24 hours.

- Risk factor to predispose to infection
  - Premature labor
  - Prolonged rupture of membranes
  - Heavy maternal colonization
  - Obstetrical complications

  *The presence of group B Streptococci in the mother does not predict severe neonatal infection*

Transplacental (hematologic) infections;
- Most parasites and viral infections
- Enter the fetal bloodstream via chorionic villi
- May occur any time during gestation
- Sequelae are highly variable, depending on the gestational timing and microorganism
• TORCH infection
  T → *Toxoplasma gondii*
  O → *Other (Syphilis)*
  R → *Rubella virus*
  C → *Cytomegalovirus*
  H → *Herpes simplex virus type II HIV*

Multiorgan involvement
• Encephalitis → growth and mental retardation
• Chorioretinitis → cataract and blindness
• Hepatosplenomegaly
• Pneumonitis
• Myocarditis and congenital cardiac defect
• Bone defect

---

**Cytomegalic inclusion disease**
• Cytomegalovirus
• Most common transplacental infection
• Multiorgan involvement
  – Intrauterine growth retardation → low birth weight
  – Hepatosplenomegaly
  – Microcephaly → cerebral impairment

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**6. Neonatal Respiratory Distress Syndrome (RDS)**
• Most common cause of respiratory distress in the newborn
• Also known as Hyaline membrane disease
• Formation of membrane in the alveoli
• Almost always occur in preterm

---

Etiology and pathogenesis:
- occur in the immature lung
- caused by a deficiency of the pulmonary surfactant synthesized by Type II pneumocytes
- Type II pneumocytes are most abundant after 35 wk’s gestation.
- incidence of RDS is 60% in infant GA < 28 wks, < 5% in GA < 37%

---

**PREMATURITY**
Reduced surfactant synthesis, storage, and release
- **Increased alveolar surface tension**
- **Atelectasis**
- **Unsaturation perfusion**
- **Hypoxemia**
- **Hypercapnia**

**Hypoxemia + CO2 retention**
- **Anemia**
- **Pulmonary vasoconstriction**
- **Pulmonary hypoperfusion**
- **Increased diffusion gradient**

Plasma leak into alveoli
Fibrotic + necrotic cells (hyaline membranes)
© Elsevier 2005
• Morphology of lungs;
  – Gross: solid, airless, reddish purple
  – Microscopic: poorly developed alveoli, collapsed alveoli, proteinaceous “membranes” line respiratory bronchioles, alveolar ducts and random alveoli

  Respiratory distress syndrome

• Clinical presentation:
  - Typical infant with RDS is preterm with AGA
  - RDS is associated with
    * maternal diabetes (surfactant synthesis is suppressed by high insulin levels)
    * cesarean section delivery

• Assessment of fetal surfactant synthesis:
  - Before delivery: Amniotic fluid phospholipids (lecithin/sphingomyelin ratio)

• Treatment:
  Before delivery:
  - Corticosteroids; prevent RDS by inducing formation of surfactant lipids and apoprotein in fetal lung
  After delivery:
  – Surfactant replacement
  – Oxygen therapy

• Uncomplicated case; recovery begins in 3 to 4 days

• But infants are risk for developing retinopathy of prematurity (ROP) and bronchopulmonary dysplasia (BPD), both due to high-concentration oxygen therapy

• Other complications of prematurity; patent ductus arteriosus, IVH, NEC

7. Necrotizing Enterocolitis (NEC)

• Spontaneous bowel ischemia

• Clinical features
  – Bloody stool
  – Abdominal distension
  – Absent bowel sound

• Sites: terminal ileum, cecum, and right – sided colon
Abdominal radiographs:
- gas within the intestinal wall (pneumatosis intestinalis)

Microscopic: mucosal or transmural coagulative necrosis, ulceration, bacterial colonization, and submucosal gas bubbles.

**NEC**

- Treatment:
  - Early NEC; conservative treatment
  - 20-60% resection of necrotic bowel segment

8. Germinal matrix, intraventricular hemorrhage

- Germinal matrix: subependymal tissue
- Severe complication of prematurity
- Typical in less than 32-33 weeks of gestation
- Rare in mature infant

Clinical features
- Small hemorrhage → Asymptomatic
- Large hemorrhage → Tense frontanelle → Seizure → Anemia, cyanosis → Apnea

9. Fetal Hydrops

- Generalized edema of the fetus
- Fluid accumulation during intrauterine growth
- Immune and non-immune hydrops
Hydrops fetalis

- Immune hydrops
  - Hemolytic disease in the newborn caused by blood-group incompatibility between mother and child
  - ABO, Rh blood gr.

- Nonimmune hydrops
  Three major causes
  - Cardiovascular defect
  - Chromosomal anomalies; trisomy 18,21
  - Fetal anemia unrelated to immune hemolysis

  Homozygous α-thalassemia
  Most common in SEA

---

**Fetal Anemia**
- Homozygous alpha-thalassemia
- Parvovirus B19
- Immune hydrops (Rh and ABO)

**Twin Gestation**
- Twin-to-twin transfusion

**Infection (excluding parvovirus)**
- Cytomegalovirus
- Syphilis
- Toxoplasmosis

**Major Malformations**
- Tumors
- Metabolic disorders

---

**TABLE 10-5 Selected Causes of Hydrops Fetalis**

(in decreasing order of frequency)

<table>
<thead>
<tr>
<th>Category</th>
<th>Causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular</td>
<td>Malformations, Tachycardia, High-output failure</td>
</tr>
<tr>
<td>Chromosomal</td>
<td>Turner syndrome, Trisomy 21, trisomy 18</td>
</tr>
<tr>
<td>Thoracic Causes</td>
<td>Cystic adenomatoid malformation, Diaphragmatic hernia</td>
</tr>
</tbody>
</table>

---

**Twin-twin transfusion syndrome**

Left: excessive blood volume
Right: deficient blood volume

---

Hydrops fetalis
10. Inborn errors of metabolism and other genetic disorders

- Phenylketonuria
- Galactosemia
- Cystic Fibrosis

Phenylketonuria (PKU)

- Dietary phenylalanine;
  - 50% required for protein synthesis
  - Remainder is converted into tyrosine by the phenylalanine hydroxylase system

- Mutation of phenylalanine hydroxylase gene >>> variable enzymatic deficiencies >>> elevated phenylalanine

Phenylketonuria

- Classic PKU; Scandinavian
- Clinical features:
  - Normal at birth
  - Rising plasma phenylalanine within the first few weeks of life
  - Impaired brain development and mental retardation

Galactosemia

- Lactose (milk) >>> glucose + galactose
- Galactose >>> glucose; three enzymes
- Autosomal recessive
- Mutation of galactose-1-phosphate uridyl transferase (GALT)
- Accumulate galactose-1-phosphate

Galactose pathway

- Galactose
- Galactokinase
- Galactose-1-phosphate
- UTP-Galactose
- UDP-Galactose
- UDP-Galactose kinase
- Glucose-1-phosphate
Cystic fibrosis (CF)

- Most common lethal genetic disease affecting whites.
- Affect epithelial chloride ion transport
- Abnormal fluid secretion in exocrine glands and in respiratory, gastrointestinal, and reproductive mucosa
- CF gene; **CFTR (cystic fibrosis transmembrane conductance regulator)** protein, **cms 7q31.2**

Morphology

- Pancrease; atrophy of exocrine pancreas >>> impaired absorption; avitaminosis A
- Intestine; meconium ileus >>> bowel obstruction
- Liver; diffuse hepatic cirrhosis
- Salivary gland; glandular atrophy
- Male genital tract; azoospermia and infertility

• Clinical features;
  - Fail to thrive
  - Present with vomiting and diarrhea after milk ingestion
  - Liver – hepatomegaly, cirrhosis
  - Eyes – cataracts
  - Brain – nonspecific alteration; mental retardation

| Mutation in cystic fibrosis gene |
| Abnormal gene product |
| ↓ |
| Impaired cAMP-activated chloride channel |
| ↓ |
| Impaired chloride and fluid secretion |
| ↓ |
| Low volume secretions and macromolecular hyperconcentration |
| ↓ |
| Stasis and obstruction |
| ↓ |
| Pancreas | Intestine | Hepatobiliary | Lungs | Vas deferens |

• Lungs; superimposed infection and pulmonary abscess;
  - Three most common organisms:
    - *Staphylococcus aureus*,
    - *Haemophilus influenzae*,
    - *Pseudomonas aeruginosa*
  - *Burkholderia cepacia* is associated with fulminant illness
Cystic Fibrosis

- Clinical course;
  - Malabsorption
  - Cardiorespiratory complications: chronic cough, persistent lung infection, obstructive pulmonary disease, cor pulmonale are the most common cause death

11. Sudden infant death syndrome (SIDS)

- National Institute of Clinical Health and Human Development:
  - "sudden death of an infant less than 1 year of age, that remains unexplained after thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history"

SIDS

- Most SIDS deaths occur between 2 and 4 months of life
- Infant usually dies while asleep, without evidence of distress or struggle.
- Pathogenesis; poorly understood, multifactorial disorders

- Potential risk factors;
  - Infant sleeping prone
  - Prematurity and low birth weight
  - SIDS in prior sibling
  - Young maternal age
  - Short intergestational interval
  - Inadequate prenatal care
  - Low socioeconomic status
  - Maternal smoking and drug abuse

12. Tumor and Tumor-like Lesions

TUMOR-LIKE LESION

- Heterotopia (choristoma)
  Normal cells or normal tissue present in abnormal location
  → ectopic pancreas

- Hamartoma
  Focal and excessive over-growth of cells or tissue native to the organ in which it occurs.
BENIGN TUMOR

Hemangioma
- Most common tumor of infancy
- Most are cutaneous; face, scalp
- Flat-to-elevated, irregular, red-blue mass
- Commonly spontaneous regress

A: Congenital capillary hemangioma
B: Age 2 yrs, after spontaneous regression

Sturge-Weber syndrome
"Port Wine Nevus"

• Lymphangiomas:
  – skin, neck, axilla, mediastinum, retroperitoneum
  – Clinically significant if they encroach on vital structures
  – Histology: cystic and cavernous lymphatic spaces.
Teratoma

- Neoplasm made up from different type of tissue
- Most common teratoma of childhood → sacrococcygeal teratoma
- Two peak incidence; age 2 and late adolescence

Sacrococcygeal teratoma

MALIGNANT TUMORS

- Malignant tumors of infancy differs from those of adulthood
  → Incidence and type of tumors
  → Underlying familial or genetic aberration
  → Tendency to regress spontaneously or cytodifferentiate

- Incidence of malignant tumor in children
  1. Leukemia & lymphoma (principally acute lymphoblastic leukemia)
  2. CNS tumors
  3. Neuroblastoma
  4. Sarcoma → rhabdomyosarcoma
  5. Wilm’s tumor
  6. Bone tumors → Ewing sarcoma
  7. Retinoblastoma

Leukemia

- Most common malignancy in children
- Acute lymphoblastic leukemia (ALL) → most common type of leukemia
  - 2-6 years
  - Anemia
  - Thrombocytopenia → petechiae, purpura
  - Hepatomegaly
  - Splenomegaly
  - Lymphadenopathy

Neuroblastoma

- Second most common solid malignancy of childhood (after CNS tumors)
- Most common intra-abdominal solid malignancy in childhood
- 40% arise in adrenal gland
- Remainder → sympathetic chain
• Clinical features
  – Large abdominal mass
  – Metastasis → Bone, lymph node, liver
• 90% of neuroblastoma produce catecholamines
• Elevated blood or urine catecholamine metabolites are important diagnostic features.

• Urine Vanillylmandelic acid (VMA); test for pheochromocytoma, ganglioneuroma, neuroblastoma

• Histology:
  - sheets of small round blue cells
  - Homer-Wright pseudorosettes
  - Variable differentiation; schwannian stroma

Wilm’s tumor

• Most common primary renal tumor of childhood; usually age 2-5 yr.
• Second commonest intra-abdominal malignancy of childhood
• Poorly-differentiated renal tumor arising from embryonic metanephric blastema
• Clinical features → abdominal mass

• Prognosis:
  – Histologic anaplasia (large cell, hyperchromatic, pleomorphic nuclei and abnormal mitoses) → worse prognosis

• Treatment:
  – Chemotherapy; excellent prognosis
Retinoblastoma

Leukokoria