

## BIRTH INJURIES Background & Risk Factors

- **Definition:** A birth injury is an impairment of the infant's body function or structure that arises from adverse influences at birth—this includes events before, during, or after delivery, even during resuscitation.
  - **Incidence:** Rates have steadily declined over time—from approximately 2.6 per 1,000 live births in 2004 to around 1.9 per 1,000 in 2012.
  - **Risk Factors:**
    - **Fetal-related:** Macrosomia (large baby), macrocephaly, prematurity or very low birth weight, malpresentation (especially breech), congenital anomalies, low amniotic fluid.
    - **Maternal-related:** Obesity, diabetes, cephalopelvic disproportion, small stature, primiparity (first childbirth), dystocia (difficult labor), prolonged or rapid labor.
    - **Iatrogenic/instrumentation-related:** Use of forceps, vacuum extraction, versions, and extractions.
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## Examination Guidelines

- Newborns deemed at risk—for example those who needed resuscitation—should receive a comprehensive physical and neurologic evaluation.
  - **Key areas include:** symmetry, cranial nerve function, joint range of motion, and skin integrity (including scalp).
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## Types of Birth Trauma

### *A. Head & Neck Injuries*

1. **Scalp Monitoring Electrode Trauma**
  - Can cause minor abrasions or lacerations; typically superficial and heal without intervention.
2. **Extra cranial Haemorrhages**
  - **Caput Succedaneum:** A subcutaneous edema on the scalp with poorly defined margins that may extend over suture lines; typically benign and resolves in days. Monitor for hypovolemia and treat hyperbilirubinemia as needed.
  - **Subgaleal Hematoma:** More serious; can bleed under the scalp layers and become infected. May require antibiotics or drainage if there's deterioration.
3. **Intracranial Hemorrhage**
4. **Skull Fractures**
  - **Linear fractures (often parietal):** Typically asymptomatic unless accompanied by bleeding. Use skull radiograph for diagnosis.
  - **Depressed fractures (often frontal or parietal):** Often from forceps. Require neurosurgical evaluation and possibly closed elevation.

- **Occipital osteodiastasis:** A serious separation of the occiput that can lead to cerebellar injury—often lethal in breech deliveries.
- **Dural tears:** can result in herniation and leptomeningeal cysts; follow-up imaging recommended.
- 5. **Facial or Mandibular Fractures**
  - Can arise from difficult delivery or forceps.
  - Look for facial asymmetry, swelling, crepitus, or feeding difficulty.
  - Healing begins within 7–14 days; requires prompt imaging, specialist consultation, and sometimes antibiotics.
- 6. **Nasal Injuries**
  - Often due to mechanical pressure during delivery.
  - Cartilage dislocation is more common than fracture (<1% incidence).
  - Early treatment prevents septal deformities; otolaryngology consult may be needed.
- 7. **Ocular Injuries**
  - **Retinal haemorrhages:** Common and benign; resolve within days.
  - **Sub conjunctival haemorrhages:** Also frequent; benign.
  - **Instrument-related injuries:** (e.g., forceps) leading to hyphema, vitreous bleeding, corneal damage, or orbital trauma are rare but may require ophthalmologic intervention.
- 8. **Pharyngeal/Oesophageal Injuries**
  - Minor trauma may result from bulb suctioning; more serious perforations can occur from nasogastric or endotracheal tube placement.
  - Present with difficulty feeding and excessive secretions.
  - Requires imaging and sometimes surgical or chest tube interventions.

## *B. Cranial Nerve, Spinal Cord & Peripheral Nerve Injuries*

- **Cranial Nerve Injuries**
  - **Facial Nerve (VII):** Most common peripheral nerve injury (~1% of births). Caused by compression or forceps. Presents as asymmetrical crying facies. Peripheral injuries involve the entire side of the face; central injuries affect only the lower half. Typically resolve by ~6 weeks; bilateral involvement may need tracheostomy.
- **Spinal Cord Injuries**
  - Rare, but can occur due to excessive neck extension, breech delivery, or shoulder dystocia.
  - May result in asymmetric breathing due to phrenic nerve dysfunction.
  - Diagnosed via imaging; most recover in 1–3 months. Persistent cases may require diaphragm plication or nerve pacing.
- **Brachial Plexus Injuries (Incidence ~1 per 1,000 births)**
  1. **Erb–Duchenne palsy (C5–C6):** Arm held in "waiter's tip" position; common type (~90%); good recovery with therapy.
  2. **Total plexus palsy:** Entire arm flaccid; may involve Horner syndrome.
  3. **Klumpke palsy (C7–T1):** Very rare; hand weakness plus possible Horner syndrome.

- Imaging helps differentiate from fractures. Treatment is conservative; surgery considered if no biceps function by 3 months. Recovery is generally favorable (>90%) if nerve roots are intact.

### *C. Bone & Skeletal Injuries*

#### 1. **Clavicular Fractures**

- Most common birth fracture (up to 2% in some studies, higher in others). Often manifests a few days after birth.
- Diagnosed via X-ray, managed with immobilization; full recovery expected.

#### 2. **Femoral Epiphyseal Separation**

- Can mimic hip dysplasia. Typically diagnosed via ultrasound.
- Treatment involves immobilization (10–14 days) and pain management.

### *D. Intra-Abdominal Injuries*

- **Hepatic Injury:** Most common intra-abdominal birth injury. Risk in macrosomic or breech neonates. Presents with signs of blood loss in the first 1–3 days. Management includes volume resuscitation and possible surgery.
- **Splenic Injury:** Presents similar to liver injury; may be managed conservatively if stable or surgically if needed.
- **Adrenal Hemorrhage:** Often unilateral (90%) and right-sided (75%). Signs include flank mass, shock, or adrenal insufficiency. Diagnosis via ultrasound; treat with volume replacement and steroids if needed. Surgery is rare.

### *E. Soft Tissue Injuries*

- **Petechiae & Ecchymoses:** Common and usually benign. If uncertain, evaluate for bleeding disorders. Resolve within ~1 week.
- **Lacerations & Abrasions:** May result from scalp electrodes or C-section incisions. Clean and monitor—some may need suturing or antibiotics.
- **Subcutaneous Fat Necrosis:** Presents in the first two weeks with firm nodules; resolves over weeks to months. Monitor for hypercalcemia.