

### **3.5 & 3.6 Term, Pre term, Post term and High Risk Neonate, Examination of newborn, gestational age**

#### **Unit 3. Part 3. Topic 5 & 6**

5. Definition and management of Term, Pre term, Post term and High Risk Neonate. 6. Examination of newborn and assessment of gestational age.

#### **5.1 Definitions (use these exact clinical cut-offs)**

Category	Definition (Gestational Age by best obstetric dating)	Typical risks to anticipate
<b>Preterm</b>	<b>&lt;37 weeks</b>	Respiratory instability/apnoea, hypothermia, hypoglycaemia, feeding immaturity, sepsis, jaundice
<b>Term</b>	<b>37 0/7 to 41 6/7 weeks</b> (Early term 37-38 6/7; Full term 39-40 6/7; Late term 41-41 6/7)	Transient tachypnoea, jaundice, feeding/latch issues; usually stable with routine care
<b>Post-term</b>	<b>≥42 0/7 weeks</b>	Meconium aspiration, birth trauma, hypoglycaemia, polycythaemia, dysmaturity (dry/peeling skin, long nails)
<b>High-risk neonate</b>	Any newborn with <b>elevated probability of morbidity/mortality</b> due to maternal, intrapartum or neonatal factors (see list below)	Depends on risk profile; needs closer monitoring/early referral

**High-risk criteria (remember ≥6 examples):** preterm/LBW/VLBW/ELBW; SGA/LGA; multiple pregnancy; infant of a diabetic or hypertensive mother; meconium-stained or asphyxiated at birth (low Apgar/need for resuscitation); sepsis risk (PROM > 18 h, maternal fever, foul liquor); congenital anomalies; Rh isoimmunisation/jaundice in first 24 h; hypothermia; hypoglycaemia; difficult instrumental/CS delivery; maternal drugs/epilepsy/thyroid disease.

#### **5.2 Management frameworks**

##### **A) Term neonate — Routine Essential Newborn Care (ENC)**

- **Warmth:** dry immediately, cap the head, delay bathing; room ~26-28 °C.
- **Airway/Breathing:** position with neutral head; no routine deep suction.
- **Skin-to-skin / KMC:** initiate early; room-in with mother.
- **Feeding: EIBF within 1 hour**, exclusive breastfeeding (EBF) on demand (8-12 feeds/day). Support latch/position.
- **Cord care:** clean and **dry**, no applications; watch for redness/discharge.
- **Vitamin K & immunisation** as per national schedule.
- **Monitoring Day 1:** respirations 30-60/min, HR 100-160/min, temp 36.5-37.5 °C; urine in 24 h, meconium in 24-48 h.
- **Discharge + follow-up counselling:** jaundice signs, feeding adequacy (stools/urine counts), safe sleep, danger signs.

##### **B) Preterm neonate — Stabilise, prevent heat/energy loss, support breathing & feeding**

- **Thermal care:** radiant warmer; plastic wrap for very preterm; minimal handling; early **KMC** once stable.
- **Breathing:** continuous monitoring; oxygen/CPAP as needed per unit protocol; avoid hyperoxia.
- **Glucose:** early screening; **frequent small feeds**; if unable to suck—expressed breast milk (EBM) via cup/NG; **donor human milk** if mother's milk unavailable.
- **Sepsis prevention:** strict hand hygiene; early danger-sign recognition; antibiotics only when indicated.
- **Jaundice:** early surveillance; treat as per thresholds.
- **Apnoea of prematurity:** monitor; caffeine/respiratory support as per specialist guidance.
- **Discharge readiness:** stable temp in open cot, adequate feeding/weight gain, parents trained in KMC and feeding.

### C) Post-term neonate — Watch for dysmaturity, meconium & metabolic issues

- **Airway:** if non-vigorous with thick meconium, manage as per resuscitation guidance (airway clear then ventilate).
- **Metabolic:** early **glucose monitoring** and feeds; monitor for **polycythaemia** (plethora, lethargy).
- **Thermal & skin care:** dry/peeling skin—gentle emollients/oiling; maintain warmth.
- **Observation:** respiratory distress, hypoglycaemia, jaundice; treat promptly.

### D) High-risk neonate (generic first-hour plan)

1. **Triage under warmer**, attach pulse oximeter; record T, HR, RR, SpO<sub>2</sub>.
2. **Airway/Breathing:** look-listen-feel; CPAP/ventilation if indicated (per NRP).
3. **Circulation/Glucose:** delayed cord clamping if vigorous; sample glucose within 1-2 h in at-risk; treat low values per protocol (early feeds/IV dextrose).
4. **Feeding/KMC:** prioritise EBM/DHM; initiate **KMC** when stable; avoid pre-lacteals.
5. **Sepsis screen** if risk factors; start antibiotics only when indicated.
6. **Document & counsel** caregivers; plan follow-up and red-flag education.

## 6. Examination of the Newborn & Assessment of Gestational Age

### 6.1 Preparation & environment

- **Warm, quiet room**, clean hands, adequate light.
- Examine **1-2 hours after feed** if possible; keep baby **skin-to-skin** on mother between steps.
- **Explain** to the parent and obtain consent; maintain privacy.

### 6.2 Sequence (head-to-toe) with normal anchors

**A. First look (before touching):** posture, colour (pink/central cyanosis), respiratory effort, cry, spontaneous movements, any dysmorphic features.

#### B. Vital signs & anthropometry

- **RR:** 30-60/min (periodic breathing acceptable; sustained >60 with retractions = abnormal).
- **HR:** 100-160/min (crying raises; deep sleep lowers).
- **Temp:** 36.5-37.5 °C (axillary).
- **Weight:** ~2.5-4.0 kg (term); **Length:** ~48-52 cm; **Head circumference (OFC):** ~33-35 cm.
- **Red flags:** hypothermia <36.5, RR ≥ 60 with indrawing, HR < 100 or > 180, weight <2.5 kg (LBW).

**C. Skin:** colour, vernix/lanugo, milia, Mongolian spots, birthmarks; **dehydration**, petechiae, pustules; **capillary refill**.

#### D. Head & face:

- **Moulding, caput succedaneum/cephalhaematoma:** sutures/fontanelles (AF ~2-3 cm soft/flat).
- **Eyes:** red reflex; discharge; scleral icterus.
- **Ears:** shape/position; cartilage recoil (also a Ballard item).
- **Nose:** patency (choanal atresia if cyanosis improves on crying).
- **Mouth:** palate (cleft), tongue tie, natal teeth; suck strength and coordination.

**E. Neck & clavicles:** masses (cystic hygroma), **clavicle fracture** (tenderness/crepitus).

**F. Chest & lungs:** symmetry; retractions; added sounds.

**Cardiovascular:** precordial activity, **murmurs**, femoral pulses (coarctation screen), perfusion.

**G. Abdomen:** shape, organomegaly, umbilical cord/stump (redness spread is sepsis sign), herniae; bowel sounds.

#### H. Genitalia & anus:

- **Male:** hypospadias, undescended testes, hydrocele.
- **Female:** labial anatomy, pseudo-menses (oestrogen withdrawal).
- **Anus:** patency, position; passage of meconium.

**I. Spine & hips:** midline integrity (dimple/sinus), **Ortolani/Barlow** for DDH (gentle, with supervision).

**J. Limbs & digits:** deformities (clubfoot), symmetry, **palmar creases**; brachial plexus injury signs.

**K. Neurologic tone & primitive reflexes:**

- **Posture** (flexor tone at term), **Moro, rooting, suck, palmar/plantar grasp, stepping, Galant**; asymmetric Moro → brachial plexus/clavicle issue; absent/rooting-suck → CNS/GA concerns.

**Document** all findings with date/time; plot anthropometry on appropriate charts.

### **6.3 Assessment of Gestational Age (GA)**

**A) Gold-standard hierarchy (quote this in exams):**

1. **First-trimester ultrasound (USG)** dating (most accurate).
2. **Reliable LMP** (regular cycles, known dates).
3. **Neonatal maturity examination** (physical + neuromuscular signs) when obstetric dating is unavailable/uncertain.

**B) The (New) Ballard Score — know the components**

**Physical criteria (morphology):**

1. **Skin** (translucent → cracking/peeling)
2. **Lanugo** (absent → abundant → thinning)
3. **Plantar creases** (none → anterior → full sole)
4. **Breast tissue** (areola size, bud)
5. **Eye/ear** (lid fusion; ear cartilage recoil)
6. **Genitalia** (male: testes/scrotal rugae; female: labia majora/minora coverage)

**Neuromuscular criteria (tone):**

1. **Posture** (flexion of limbs)
2. **Square window** (wrist flexibility)
3. **Arm recoil**
4. **Popliteal angle**
5. **Scarf sign** (elbow to midline across chest)
6. **Heel-to-ear**

- Each item is scored (typically **-1 to 5**); **sum physical + neuromuscular** → convert to GA (weeks) using the Ballard conversion table kept in the unit.
- **Tips for accuracy:** perform **between 2-24 h** of life in stable infants; illness/asphyxia may **depress tone** → underestimate GA. In **SGA** babies, skin/creases may appear “older,” while tone may not—so interpret with caution and correlate with obstetric dates.

**C) Dubowitz method** (older, longer) — includes 21 neurological & 11 physical items; you are expected to **name** it and know it is more detailed but less commonly used at bedside compared with (New) Ballard.

**D) Why GA assessment matters**

- Guides **temperature & glucose protocols**, respiratory expectations, **feeding plans**, jaundice risk windows, **follow-up intensity**, and legal/medico-social documentation.

## Integrating Āyurveda with recent neonatology

- Childhood is **kapha-pradhāna** (anabolic, tender agni) → **warmth, unhurried sleep, breastmilk** as first-line (*bṛmhana*).
- Sāmānya-Viśeṣa** explains why appropriately similar inputs (skin-to-skin warmth, human milk, gentle oils) **build bala/ojas** in preterm/LBW, while dissimilar/excessive inputs (cold/stimulating baths, incompatible feeds) **harm**.
- Routine examination and GA scoring **do not contradict** classical principles; they **translate** them into precise, reproducible observations for safety and referral.

## Self-Assessment

### MCQs (choose one best answer)

- Preterm** is defined as birth at:  
A. <36 w B. **<37 w** C. <38 w D. <39 w
- A baby at **41 5/7 w** GA is classified as:  
A. Post-term B. **Late term** C. Full term D. Early term
- The **most accurate** method for estimating GA is:  
A. LMP recall B. **First-trimester USG** C. New Ballard D. Dubowitz
- In (New) Ballard, **Scarf sign** assesses:  
A. Skin maturity B. **Shoulder girdle tone/elasticity** C. Ear cartilage D. Plantar creases
- First action in a **high-risk** neonate with temp 36.0 °C is:  
A. Give IV fluids B. Start antibiotics C. **Rewarm under radiant warmer/KMC and reassess** D. Immediate bath

**Answers:** 1-B, 2-B, 3-B, 4-B, 5-C.

### Short-answer (3-5 lines)

- List **six conditions** that make a neonate high-risk.
- Write the **five most important observations** in the first minute of newborn examination.
- Enumerate **six (New) Ballard items** and the principle behind GA estimation.
- Outline immediate management priorities in a **post-term** baby with meconium-stained liquor but vigorous at birth.
- Explain how **Sāmānya-Viśeṣa** supports **EBF** and **KMC** in preterm care.

### Long-answer (10-12 marks)

- Define and compare **preterm, term, and post-term** neonates. Discuss **risk-based management** for each, integrating thermal care, breathing, feeding, glucose, jaundice surveillance, and parental counselling.
- Describe a **systematic examination of the newborn** and the **assessment of GA** using the (New) Ballard Score. Add how illness or SGA status may bias findings and how you will reconcile them with obstetric dating.

## References

### Classical

- Aṣṭāṅga Hṛdayam** — Uttaratantra 1 (*Bālopacaraṇīyam*): immediate care logic supporting warmth/airway/feeding.
- Suśruta Saṃhitā** — Śārirasthāna chapters on *ṛtu-kṣetra-ambu-bīja*, mother-fetus nourishment and puerperal care.
- Kāśyapa Saṃhitā (Vṛddha-Jīvakiya Tantra)** — infant care, *stanya*, *dhātrī*, and weaning context.

## Modern (standard paediatrics)

- **WHO Essential Newborn Care & Warm Chain; Kangaroo Mother Care** guidelines.
- **Neonatal Resuscitation Program (NRP)** essentials.
- **Nelson Textbook of Pediatrics**, latest ed. — Neonatology; **IAP Textbook of Pediatrics** — Newborn examination & GA assessment.
- **Ballard, Dubowitz** original/updated scoring descriptions (unit charts for conversion kept in NICU/LR).

## 60-second recap

- **Know the GA bands:** preterm <37 w; term 37-41 6/7; post-term  $\geq$ 42 w.
- **Term** → routine ENC; **preterm** → thermal/respiratory/feeding vigilance + KMC; **post-term** → meconium/metabolic watch.
- **High-risk** = any added vulnerability—start with warmer, monitor, feed early, screen glucose, watch for sepsis.
- **Examination** = structured head-to-toe + vitals + anthropometry + reflexes.
- **GA** = obstetric dating first; (New) Ballard as corroboration (6 physical + 6 neuromuscular signs).