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
Preterm	**<37 weeks**	Respiratory instability/apnoea, hypothermia, hypoglycaemia, feeding immaturity, sepsis, jaundice
Term	**37 0/7 to 41 6/7 weeks** (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
Post-term	**≥42 0/7 weeks**	Meconium aspiration, birth trauma, hypoglycaemia, polycythaemia, dysmaturity (dry/peeling skin, long nails)
High-risk neonate	Any newborn with **elevated probability of morbidity/mortality** 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_2.
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 (*bṛṃhaṇa*).
- **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)

1. **Preterm** is defined as birth at:
   A. <36 w B. **<37 w** C. <38 w D. <39 w
2. A baby at **41 5/7 w** GA is classified as:
   A. Post-term B. **Late term** C. Full term D. Early term
3. The **most accurate** method for estimating GA is:
   A. LMP recall B. **First-trimester USG** C. New Ballard D. Dubowitz
4. In (New) Ballard, **Scarf sign** assesses:
   A. Skin maturity B. **Shoulder girdle tone/elasticity** C. Ear cartilage D. Plantar creases
5. 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)

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

Long-answer (10–12 marks)

1. 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.
2. 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** — Śārīrasthāna 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 ≥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).