

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.

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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, SpO₂.
- 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:

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- 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.

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Integrating Ayurveda 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

- $\bullet \ \ \, \textbf{Aṣṭāṅga Hṛdayam} \textbf{Uttaratantra 1} \ (\textit{Bālopacaraṇīyam}): immediate care logic supporting warmth/airway/feeding. \\$
- Suśruta Saṃhitā Śārīrasthāna chapters on rtu-kṣetra-ambu-bīja, mother-fetus nourishment and puerperal care.
- Kāśyapa Saṃhitā (Vṛddha-Jīvakiya Tantra) infant care, stanya, dhātrī, and weaning context.

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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).

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