3.8.1. Etiology, clinical features and management of Navajata Rogas- Swasavarodha (Respiratory distress)

Unit 3 · Topic 8.1. Navajāta Rogas—Śvāsavarodha (Respiratory Distress)

(Etiology, Clinical Features, and Management)

Learning goals

By the end of this lesson you will be able to:

- define **Śvāsavarodha** (neonatal respiratory distress) and list major **etiologies**;
- recognise **clinical features** and grade severity at the bedside;
- integrate **Ayurvedic rationale** (prāṇa-vāta, kapha-āvaraṇa, prāṇavaha-srotorodha) with **modern neonatology**;
- outline **stepwise management** from delivery room through early neonatal period;
- write exam-ready differentials and justify decisions with precise reasoning.

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1) Definition & Ayurvedic–recent correlation

Śvāsavarodha (śvāsa = breath; avarodha = obstruction/impediment) in the **navajāta śiśu (0–28 days)** is a state of **laboured or inadequate breathing** due to mechanical, parenchymal, circulatory, or maturational causes.

- **Ayurvedic view:** predominance of **kapha** (kleda, śleṣma) and **tender agni** in bālya can predispose to **prāṇavaha-srotas saṅga/āvaraṇa** (airway fluid retention, mucus, or pressure effects), with **prāṇa/udāna-vāta** dysregulation.
- **Recent view:** "respiratory distress" is **tachypnoea ≥60/min** plus any **grunting, nasal flaring, chest retractions**, cyanosis, or oxygen need.

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2) Etiology (know at least 6–8, grouped)

A. Pulmonary parenchymal

- **TTN** (Transient Tachypnoea of the Newborn) — delayed lung fluid clearance; common in **LSCS**/no-labour deliveries.
- **RDS** (surfactant deficiency disease) — **preterm**; ground-glass lungs, air bronchograms.
- **MAS** (Meconium Aspiration Syndrome) — term/post-term with meconium-stained liquor.
- **Pneumonia** (early/late onset), **sepsis**.
- **Pulmonary haemorrhage** (often after asphyxia/RDS).

B. Airway/ ventilation mechanics

- **Choanal atresia**, **laryngomalacia**, **tracheo-oesophageal fistula**, **congenital diaphragmatic hernia** (CDH), **pneumothorax**.

C. Circulatory/ hemodynamic

- **Persistent Pulmonary Hypertension of the Newborn (PPHN)**; **congenital heart disease** with duct-dependent flow; severe **anaemia** or **polycythaemia**.

D. Metabolic/ neurologic

- **Hypothermia**, **hypoglycaemia**, **acidosis**, **CNS depression** (asphyxia, drugs).

Risk amplifiers: prematurity, maternal diabetes, chorioamnionitis, prolonged rupture of membranes, no labour (elective

LSCS), post-term, growth restriction (SGA), multiple gestation.

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3) Pathophysiology in two languages

Ayurvedic language	Recent language
Prāṇavaha-srotorodha / kapha-āvaraṇa → impeded air movement, retained *kleda*	Airway fluid/ mucus, surfactant deficiency, meconium obstruction, structural block
Vāta-udāvarta (disordered prāṇa/udāna)	Poor respiratory drive/mechanics; fatigue; neuromuscular depression
Ojas-kṣaya by cold/āma	Hypothermia, sepsis/inflammation → ↑ work of breathing, oxygen need
Agni-mandya in bālya	Immature enzymes/surfactant pathways; poor thermoregulation & glucose control

Clinical inference: management must **remove āvaraṇa/saṅga** (clear airway, recruit alveoli, reduce oedema), **protect prāṇa/ojas** (warmth, human milk, rest), and **stabilise agni** (avoid over-handling/over-feeding; small frequent feeds/EBM).

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4) Clinical features

- **Tachypnoea** ≥60/min (count for full minute).
- **Nasal flaring**, **grunting** (expiratory), **intercostal/subcostal/xiphoid retractions**.
- **Cyanosis** (central), **apnoea** or poor cry, poor feeding/ lethargy.
- **Auscultation:** crackles (TTN/pneumonia), diminished breath sounds (pneumothorax), asymmetry (MAS).
- **Perfusion**: tachycardia/bradycardia, delayed capillary refill; **pre-/post-ductal SpO_2 difference** (PPHN/CHD).

Severity scoring (learn one scale) — Silverman–Anderson Score (SAS)

Sign	0	1	2
Upper chest movement	Synchronous	Lag	See-saw
Lower chest retractions	None	Just visible	Marked
Xiphoid retractions	None	Just visible	Marked
Nares dilatation	None	Minimal	Marked
Expiratory grunt	None	Audible with stethoscope	Audible by ear

SAS 0–2: mild; **3–5:** moderate; **6–10:** severe → urgent escalation/ventilation.

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5) Differential diagnosis at a glance

Feature	TTN	RDS	MAS	Pneumonia/Sepsis	PPHN/CHD
GA	Term/late preterm	Preterm	Term/post-term	Any	Any
Onset	Within 2 h	Immediately	At birth/within 1 h	Variable	Early, persistent hypoxaemia
Course	Improves in 24–72 h	Worsens without support	Variable, can be severe	Progressive with infection	Cyanosis out of proportion
CXR	Hyperinflation, fissure fluid	Ground-glass, air bronchograms	Patchy opacities, hyperinflation	Infiltrates	Often normal lung fields; cardiomegaly in CHD

Feature	TTN	RDS	MAS	Pneumonia/Sepsis	PPHN/CHD
Clues	Elective LSCS	Prematurity	Meconium-stained liquor	Maternal fever, PROM	Pre/post-ductal SpO_2 gap, murmur

6) Investigations (as indicated; don't delay stabilisation)

- **Pulse oximetry** (pre-ductal right hand; post-ductal foot).
- **ABG** (hypoxaemia, hypercarbia, acidosis).
- **Chest X-ray** (pattern recognition above).
- **Bedside glucose**, calcium; **sepsis screen** (CBC/CRP/blood culture) if risk.
- **Echocardiography** when CHD/PPHN suspected.

7) Management — stepwise, integrating *Jātakarma/Prāṇa-pratyāgamana* logic with NRP/ENC

7.1 Immediate stabilisation (delivery room/ER)

1. **Warm–Dry–Position** (neutral head), **clear visible obstruction only if needed**, **gentle stimulation**.
2. **Oxygen titration** to target saturations (use pre-ductal probe). If apnoeic or HR <100/min → **positive-pressure ventilation** (bag-mask) per NRP.
3. **Continuous monitoring**: RR, HR, SpO_2, temperature.
4. **Early skin-to-skin/KMC** once stable (especially late preterm/LBW); otherwise radiant warmer.

Ayurvedic rationale: removal of **āvaraṇa** (airway clearance/recruitment), preservation of **ojas** (warmth, minimal handling), protection of **agni** (calm environment, avoid early over-feeding).

7.2 Ongoing care (NICU/Nursery)

- **Thermal care:** keep **36.5–37.5 °C**; delay first bath; head cap.
- **Respiratory support:**
  - **TTN/mild distress:** humidified oxygen; **CPAP** if SAS ≥3 or persistent hypoxaemia.
  - **RDS: early CPAP**, consider **surfactant** (INSURE/LISA as per unit policy).
  - **MAS:** CPAP/ventilation as needed; avoid aggressive bagging if air-trapping; manage PPHN physiology (gentle ventilation; consider iNO where available).
  - **Pneumothorax:** needle decompression/chest tube.
- **Fluids/feeds:** start **EBM** (expressed breast milk) **early**; if RR >70/min or on significant support, **trophic feeds via OG/NG**; avoid over-feeding (aspiration risk). **Donor human milk** if mother's milk unavailable.
- **Glucose & electrolytes:** monitor and correct.
- **Antibiotics** if sepsis risk/clinical suspicion; **de-escalate** when cultures negative and baby well.
- **PPHN/CHD:** minimise stimuli; maintain adequate oxygenation; correct acidosis/hypoglycaemia; cardiology input.

7.3 Ayurveda-concordant supportive measures

- **Uṣṇa-paricaryā (warm chain)** and **KMC** = preservation of **prāṇa/ojas**.
- **Stanya-prioritisation:** mother's **diet-rest** first; correct **stanya-doṣa** (avoid heavy, very cold/incompatible items), warm water sips for the mother, **satmya**, simple broths/yūṣa to support milk.
- **Snehana (oiling): only after thermal and respiratory stability**; use **lukewarm gentle oils**, light touch; **avoid vigorous massage** in unstable/LBW/preterm neonates.
- **Absolutely avoid** oral herbal powders/decoctions in the unstable neonate; neonate-specific medicinals require institutional protocols—**do not improvise**.

7.4 Parental counselling

- Explanation of cause and expected course (e.g., TTN resolves in 1–3 days).
- Kangaroo Mother Care steps; feeding plan; danger signs: fast breathing, chest indrawing, cyanosis, poor feeding, fever/low temperature, lethargy, jaundice <24 h.
- Follow-up schedule and immunisation as per national program.

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8) Complications & prognosis

- **Hypoxemia sequelae:** PPHN, pulmonary haemorrhage; **neurologic injury** if severe/prolonged hypoxia.
- **Air-leak syndromes:** pneumothorax, pneumomediastinum (especially MAS/RDS on ventilation).
- **Feeding issues:** fatigue, aspiration; **growth faltering** if prolonged support.
- **Prognosis** depends on **etiology + GA + timeliness of support**. TTN is benign; RDS improves with CPAP/surfactant; MAS/PPHN can be severe but recover with comprehensive care.

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9) Case-based reasoning

Case 1 (TTN pattern). Term, elective LSCS. RR 74/min, mild retractions, SpO_2 92% on air, CXR: fluid in fissures.

- **Dx:** TTN. **Plan:** Warm chain, nasal **CPAP** if SAS ≥3 or PaO_2 low; minimal handling; trophic EBM feeds; wean O_2/CPAP as RR normalises. **Prognosis:** resolves in 24–72 h.

Case 2 (RDS). 32 wks, grunt + retractions at birth; CXR ground-glass.

- **Dx:** RDS. **Plan:** Early **CPAP**, consider **surfactant**; thermoneutrality; glucose; NG trophic EBM; antibiotics only if sepsis risk. **Counsel** about likely improvement over days.

Case 3 (MAS with PPHN risk). 41 wks, thick meconium, laboured breathing, cyanosis, pre-/post-ductal SpO_2 gap.

- **Plan:** Gentle ventilation/CPAP; avoid high pressures; manage PPHN physiology; watch for pneumothorax; early feeds when stable; parental counselling regarding variable course.

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10) Write-up template

Provisional Diagnosis: Navajāta **Śvāsavarodha** due to _____ (TTN/RDS/MAS/Sepsis/PPHN/CHD).
Severity: SAS __/10.
Stabilisation: Warm–Dry–Position; O_2 ___; CPAP ___; PMV ___; glucose corrected.
Investigations: CXR ___; ABG ___; Sepsis screen ___; Echo (if indicated) ___.
Feeding: EBM **trophic/PO** ___ ml/kg/d; DHM if required.
Adjuncts: KMC when stable; delayed bath; dry cord care.
Counselling: cause, course, red flags, follow-up date.

Self-Assessment

MCQs (choose one best answer)

1. A term neonate with RR 72/min, nasal flaring, mild retractions and SpO_2 93% in room air after elective LSCS most likely has:
   A. RDS B. **TTN** C. PPHN D. CDH

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2. **Silverman–Anderson Score** of **6** indicates:
   A. Mild distress B. **Severe distress (urgent support)** C. Normal D. Only need for feeding advice
3. Which **first-line** step both Ayurveda and modern care emphasise?
   A. Routine deep suction
   B. Early formula feeds
   C. **Warm chain & minimal handling**
   D. Immediate bath
4. A neonate with meconium-stained liquor, marked retractions and patchy CXR with hyperinflation is best labelled:
   A. TTN B. **MAS** C. RDS D. Pneumothorax
5. In an unstable neonate with respiratory distress, you should **avoid**:
   A. CPAP B. **Oral herbal decoctions** C. EBM via NG D. Thermal care

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

Short-answer (3–5 lines)

1. Define **Śvāsavarodha** and list **four signs** of neonatal respiratory distress.
2. Write a note on **TTN**: risk factors, CXR, course, management.
3. Explain **Ayurvedic rationale** for KMC and warm chain in respiratory distress.
4. Enumerate **four causes** of **PPHN**-like hypoxia and how you will detect it at bedside.
5. List **five danger signs** that mandate urgent referral/escalation.

Long-answer (10–12 marks)

1. Discuss the **etiology, clinical features, differential diagnosis and management** of **Navajāta Śvāsavarodha**, integrating **Ayurvedic concepts** with current neonatal practice.
2. Compare **TTN, RDS, and MAS** under: risk factors, onset, CXR, oxygen/CPAP need, course, and parental counselling. Add how you would use **Silverman–Anderson** scoring and **ABG** to guide therapy.

60-second recap

- **Śvāsavarodha** = neonatal respiratory distress. Think **TTN/RDS/MAS/sepsis/PPHN/CHD**.
- Recognise **tachypnoea, retractions, flaring, grunting, cyanosis**; grade with **SAS**.
- **First principles: Warm–Dry–Position**, oxygen/CPAP as needed, **EBM/DHM**, minimal handling; investigate as you stabilise.
- Explain the plan to parents; **KMC** and **stanya** are therapeutic—**they conserve *ojas* and support *prāṇa*.**