

## Guidance document for processing PM-JAY packages

### Advanced Neonatal Care Package

Procedures covered: 1

Specialty: Neo-natal Care

Package name	Procedures name	HBP 1.0 code	HBP 2.0 code	Package price (INR)
<p>Advanced Neonatal Care Package: Babies with birthweight of 1200-1499 g</p> <p>or</p> <p>Babies of any birthweight with at least one of the following conditions:</p> <ul style="list-style-type: none"> <li>Any condition requiring invasive ventilation longer than 24 hours</li> <li>Hypoxic Ischemic encephalopathy requiring Therapeutic Hypothermia</li> <li>Cardiac rhythm disorders needing intervention (the cost of cardiac surgery or implant will be covered under cardiac surgery packages)</li> <li>Sepsis with complications such as meningitis or bone and joint infection, DIC or shock</li> <li>Renal failure requiring dialysis</li> <li>Inborn errors of metabolism</li> </ul> <p>Mother's stay and food in the hospital for breastfeeding, family centred care and (Kangaroo Mother Care) KMC is mandatory and included in the package rate</p>	<p>Advanced Neonatal Care Package: Babies with birthweight of 1200-1499 g</p> <p>or</p> <p>Babies of any birthweight with at least one of the following conditions:</p> <ul style="list-style-type: none"> <li>Any condition requiring invasive ventilation longer than 24 hours</li> <li>Hypoxic Ischemic encephalopathy requiring Therapeutic Hypothermia</li> <li>Cardiac rhythm disorders needing intervention (the cost of cardiac surgery or implant will be covered under cardiac surgery packages)</li> <li>Sepsis with complications such as meningitis or bone and joint infection, DIC or shock</li> <li>Renal failure requiring dialysis</li> <li>Inborn errors of metabolism</li> </ul> <p>Mother's stay and food in the hospital for breastfeeding, family centred care and (Kangaroo Mother Care) KMC is mandatory and included in the package rate</p>	M300004	MN004A	6,000

**ALOS:** 15 – 30 days

**Minimum qualification of the treating doctor:**

**Essential:** DM/DNB/Equivalent (in Neonatology) and referral for other specialties based on diagnosis

**Special empanelment criteria/linkage to empanelment module:** Care at Tertiary Hospital

**Disclaimer:**

ICMR has issued clinical guidelines for 'Post-asphyxial management of neonates' and 'sepsis in neonates' to be followed in country. For monitoring and administering the claim management process of **Advanced Neonatal Care Package**, NHA shall be following these guidelines. This document has been prepared for guidance of PROCESSING TEAM and TRANSACTION MANAGEMENT SYSTEM of AB PM-JAY for the claims of procedures mentioned above. The ICMR guidelines are also included in the document for better

understanding of the SHA teams, Insurance companies and TPAs. The hospitals can also refer to this document so that they have the insight on how the claims will be processed. However, this document doesn't provide any guidance on clinical and therapeutic management of patient. In that respect the hospitals and physicians may refer to the ICMR poster and other relevant material as per the extant professional norms.

## **PART I: GUIDELINES FOR CLINICIANS AND HEALTHCARE PROVIDERS**

### **1.1 Objective:**

The purpose of this section is to act as a guidance & a clinical decision support tool for the clinicians in deciding the line of treatment, plan clinical management of patient and decide referral of cases to the appropriate level of care (as required) for treatment of patients under PMJAY and selection of corresponding Health Benefit Package.

It will also serve as a tool for hospitals to determine and submit the mandatory documents required for claiming reimbursement of health benefit package under PMJAY.

### **1.2 Clinical key pointers:**

#### **• Babies with birthweight of 1200-1499 g**

- **Prenatal consultation**
  - Parental education
  - Determining parental wishes when viability is questionable
  - Defining limits of parental choice; need for caregiver-parent teamwork
- **Delivery room care**
  - Define limits of resuscitative efforts
  - Respiratory support
  - Low tidal volume ventilation strategy
  - Prevention of heat and water loss
  - Early surfactant therapy
- **Ventilation strategy**
  - Low tidal volume, short inspiratory time
  - Avoid hyperoxia and hypocapnia
  - Early surfactant therapy as indicated
  - Define indications for high-frequency ventilation
- **Fluids**
  - Early use of humidified incubators to limit fluid and heat losses
  - Judicious use of fluid bolus therapy for hypotension
  - Careful monitoring of fluid and electrolyte status
  - Use of double-lumen umbilical venous catheters for fluid support
- **Nutrition**
  - Initiation of parenteral nutrition shortly after birth

- Early initiation of trophic feeding with maternal milk
- Advancement of feeding density to provide adequate calories for healing and growth
  - **Cardiovascular support**
- Maintenance of blood pressure within standard range
- Use of dopamine for support as indicated
- Corticosteroids for unresponsive hypotension
  - **PDA**
- Avoidance of excess fluid administration
- Consider medical therapy when hemodynamically significant PDA is present
- Consider surgical ligation after failed medical therapy
  - **Infection control**
- Scrupulous hand hygiene, use of bedside alcohol gels
- Limiting blood drawing, skin punctures
- Protocol for CVL insertion and care, minimize dwell time
- Minimal entry into CVLs, no use of fluids prepared in NICU

PDA, patent ductus arteriosus; CVL, central venous line; NICU, newborn intensive care unit.

### **Complications**

- Respiratory disorders
- Retinopathy of prematurity
- Intraventricular hemorrhage/Periventricular leukomalacia - seizures, dull activity, hypotonia
- Hypoglycemia
- Hypocalcemia
- Hypothermia
- Sepsis
- Apnea of prematurity
- Necrotizing Enterocolitis
- Gastroesophageal Reflux Disease – poor weight gain, feed intolerance, regurgitation, frequent vomiting, apnea post feeding

### **Management support**

- Treat the underlying cause
- Surfactant therapy
- Ventilatory support – oxygen, CPAP, Mechanical Ventilation
- Thermal management
- Caffeine citrate/Ibuprofen/Indomethacin administration
- Reflux position hourly feeds
- Kangaroo mother care
- Retinopathy of prematurity assessment
- Hearing assessment
- Neurodevelopmental assessment

### **• Any condition requiring invasive ventilation longer than 24 hours**

Mechanical ventilators are devices that serve to support the patient's inadequate respiratory effort until improvement in respiratory function occurs either spontaneously or after intervention.

The common indications for mechanical ventilation<sup>1</sup> are given below:

	Condition	Manifestation or criteria
1.	Correction of hypoxemia	FiO <sub>2</sub> requirement > 40-60% or failure of non-invasive respiratory support
2.	To reverse acute respiratory acidosis	pH <7.2 and, Pco <sub>2</sub> >65 mm Hg
3.	To relieve respiratory distress	Marked retractions, severe tachypnea >100/min
4.	To treat apnea or poor respiratory efforts	Poor efforts or apnea requiring bag and mask ventilation
5.	To prevent or treat lung atelectasis as in postoperative setting or neuromuscular disease	
6.	To maintain patent airway	Altered sensorium, sedation, anesthesia, neurological and neuromuscular illnesses
7.	To decrease systemic or myocardial oxygen consumption as in shock	Septic shock, congestive cardiac failure, necrotizing enterocolitis etc
8.	To stabilize chest wall	Flail chest, diaphragmatic palsy

#### Preferred modes of ventilation in different lung conditions

Underlying condition	Acute phase	Weaning	Comments
Respiratory distress syndrome	A/C, use VG option to tailor PIP	Choice 1: PSV Choice 2: SIMV+PSV	1. Look for auto-triggering while using A/C or PSV modes (use SIMV if auto triggering occurs) 2. Ensure that the leak is <30-40% while using VG
Broncho pulmonary dysplasia	A/C or PSV Use VG option to tailor PIP	Choice 1: PSV Choice 2: SIMV+PSV	
Meconium aspiration syndrome	SIMV	Choice 1: PSV Choice 2: SIMV+PSV	Avoid using A/C if the baby's spontaneous breathing rate is >80 per minute
Pneumonia	A/C or PSV	Choice 1: PSV Choice 2: SIMV+PSV	
Transient tachypnea of newborn	A/C or PSV	Choice 1: PSV Choice 2: SIMV+PSV	Avoid A/C if the baby's spontaneous rates are very high (> 80-90 per min) -expiratory time (Te) might get compromised; in these situations, use either PSV or SIMV
Apnea/shock/asphyxia (conditions with normal lung or minimal lung disease)	SIMV (rates usually kept low)	SIMV	Avoid using A/C or PSV- chances of hypocarbia if the back-up rate is kept inadvertently high.
Failure of conventional ventilation, CDH, Air-leaks	HFO	Choice 1: PSV Choice 2: SIMV+PSV Choice 3: Direct weaning to CPAP/oxygen by hood	

Note: Choice 1 indicates the preferred mode of ventilation

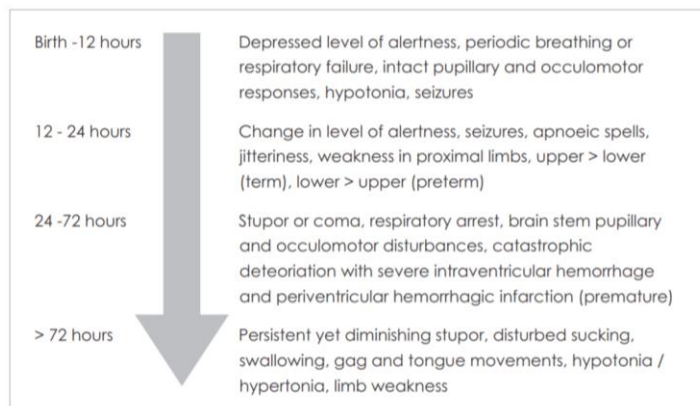
Once mechanical ventilation is initiated, the settings need to be titrated based on clinical evaluation and supported by blood gases and/ or chest x-ray as the disease condition evolves. Relying solely on blood gases may lead to late detection of worsening or delay in weaning leading to lung injury.

### • **Hypoxic Ischemic encephalopathy requiring Therapeutic Hypothermia**

The WHO definition of perinatal asphyxia is “failure to initiate and sustain breathing at birth”. Perinatal asphyxia leads to multi-organ dysfunction in the neonate and the neurological dysfunction inherent to this clinical condition is referred as Hypoxic Ischemic Encephalopathy (HIE). HIE is characterized by clinical and laboratory evidence of acute or sub-acute brain injury secondary to asphyxia. The primary causes of HIE are systemic hypoxemia and/or reduced cerebral blood flow.

#### **Clinical features**

The important CNS clinical features of HIE include altered level of sensorium, seizures and tone abnormalities.



#### **Approach to diagnosis**

A detailed history including antenatal and delivery details reflecting events leading to compromised blood supply and/or oxygenation of the fetus should be obtained. History of placental abruption, cord around neck, cord prolapse, maternal hemorrhage, trauma, cardiorespiratory arrest, uterine rupture or significant fetal decelerations if present should be recorded.

A careful neurologic examination needs to be performed to diagnose encephalopathy. Severity will be determined based on Sarnat and Sarnat/Levene's classification of HIE.

#### **Management**

Therapeutic Hypothermia (TH) has been proven to be effective in reducing morbidity associated with moderate to severe degree of HIE and has become the standard of care for HIE in developed countries.

TH has been shown to decrease brain energy use, prolong the latent phase, reduce infarct size, decrease neuronal cell loss, retain sensory motor function, and preserve hippocampal structures. Early application of TH preferably within 6 hours i.e. before the onset of the secondary phase of energy failure is likely to be effective and improve neurodevelopmental outcome. Usually it is continued for a period of 72 hours for better neuro protection.

**PREREQUISITES TO PRACTICE THERAPEUTIC HYPOTHERMIA** The minimum prerequisites to start the practice of therapeutic hypothermia have been depicted:

Place	Personnel	Paraphernalia	Protocols
Well established level-3 NICU care.	Trained doctors & Staff nurse	Radiant warmer, Cooling device, ABG machine, Multi-parametric parameters, Ventilators	Evidence based standard protocol.  Neuro-development follow up.

The initial management of infants with HIE following admission to the neonatal unit consists of standard neonatal intensive care measures, continuous core temperature monitoring using a rectal probe and initiation of therapeutic hypothermia. Monitoring of such infants is critical to the neurological outcome.

#### Complications of Therapeutic hypothermia

- Bradycardia (25%) and other cardiac arrhythmia (1%)
- Thrombocytopenia (13% - 25%)
- Hypoglycemia (10%)
- Hypocalcemia (6%)
- Shock (8%)
- Sclerema and Subcutaneous fat necrosis (6%)
- Acid-base and electrolyte disturbances
- DIC (5%)
- Pulmonary hemorrhage
- Increased blood viscosity- hemoconcentration

Meticulous neonatal care provided by multidisciplinary team is critical for ensuring better outcomes for infants with HIE on therapeutic hypothermia.

• **Cardiac rhythm disorders needing intervention (the cost of cardiac surgery or implant will be covered under cardiac surgery packages)**

(Respective detailed PMJAY guidance documents can be reviewed for more information)

- Arrhythmias in the neonatal period are not uncommon and may occur in neonates with a normal heart or in those with structural heart disease.
- Neonatal arrhythmias are classified as either benign or nonbenign:
  - Benign arrhythmias – sinus arrhythmia, premature atrial contraction, premature ventricular contraction, and junctional rhythm; these arrhythmias have no clinical significance and do not need therapy
  - Supraventricular tachycardia, ventricular tachycardia, atrioventricular conduction abnormalities, and genetic arrhythmia such as congenital long-QT syndrome are classified as nonbenign arrhythmias
- Although most neonatal arrhythmias are asymptomatic and rarely life-threatening, the prognosis depends on the early recognition and proper management of the condition in some serious cases.
- Precise diagnosis with risk stratification of patients with nonbenign neonatal arrhythmia is needed to reduce morbidity and mortality.
- The clinical manifestation is variable.
- The most common benign arrhythmia in newborns is PAC, which does not require treatment. AVRT, which is the most frequent tachyarrhythmia in neonates can be properly controlled with antiarrhythmic drug therapy. Complete AV block is the most common cause of nonbenign bradyarrhythmia, for which permanent pacemaker implantation should be performed.

**Premature atrial contractions (PAC)**

PACs are common in the neonatal period and manifest as irregular heartbeats. A premature P wave superimposed on the previous T wave can cause deformation of the T wave. Nonconduction of PACs can sometimes occur and be misdiagnosed as sinus bradycardia in neonatal intensive care units. Isolated PACs in neonates are associated with electrolyte abnormalities, hypoglycemia, hypoxia, and hyperthyroidism. PACs are generally benign and usually do not need treatment.

**Supraventricular tachycardias**

SVT is the most common type of tachyarrhythmia observed in pediatric patients, especially in the neonatal period. SVT is defined as tachycardia resulting from an abnormal mechanism involving the heart structures proximal to the bifurcation of the bundle of His, and that does not have the morphology of atrial flutter (AFL) on the surface ECG. SVT is classified into 2 types; real SVT and atrial tachycardia.



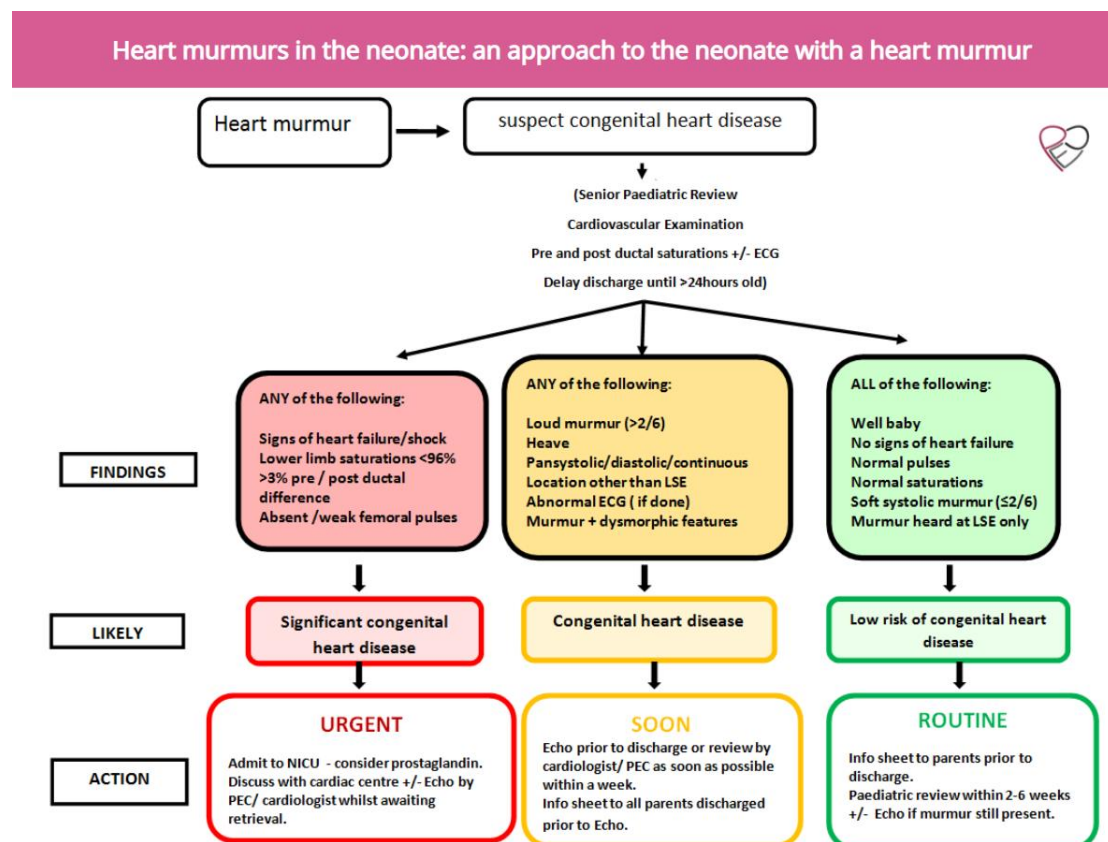
## Atrioventricular reentrant tachycardia

Accessory pathway-related AVRT is commonly associated with Wolff-Parkinson-White (WPW) syndrome in neonates. Adenosine triphosphate is the first choice of drug for acute termination of AVRT, and the mechanism of the drug is related to AV node block. To prevent recurrence, antiarrhythmic prophylaxis is recommended during the first year of life. Digoxin or propranolol is generally considered as the initial antiarrhythmic therapy.

## Complete AV block

AV block is defined as a conduction disturbance of an impulse from the atria to the ventricle and classified as either first-, second-, or third-degree (or complete) AV block. Among these types, complete AV block of the AV node results in AV dissociation between atrial and ventricular activity. Congenital complete AV block in a normal structural heart may occur in infants born to mothers with connective tissue disorders such as systemic lupus erythematosus.

Permanent pacemaker implantation is indicated in newborns or infants with complete heart block with a ventricular rate of <55 beats/min or in those with CHD and a ventricular rate of <70 beats/min. Another indication is complete heart block with a wide complex escape rhythm, complex ventricular ectopy, or ventricular dysfunction.





### **• Sepsis with complications such as meningitis or bone and joint infection, DIC or shock**

Neonatal sepsis is defined by the presence of clinical signs and symptoms of septicemia, pneumonia or meningitis along with isolation of pathogen from any of the sterile body fluids namely blood, cerebrospinal fluid or urine or abscess.

Clinical sepsis is defined as the presence of signs and symptoms of sepsis but with a negative blood or CSF culture.

- Suspected sepsis (or rule-out sepsis/risk of sepsis): infection suspected because of risk factors – maternal fever or foul smelling liquor or spontaneous onset of preterm labor or prolonged rupture of membranes (>24h)
- Presumed or clinical sepsis: clinical and laboratory findings consistent with infection without a positive culture
- Early onset sepsis (EOS): Onset  $\leq$  72h of life, mainly due to infection acquired before/during delivery
- Late onset sepsis (LOS): Onset > 72h of life, presumed to be due to infection acquired after delivery

### **Signs and Symptoms**

- Temperature instability with both febrile response as well as hypothermia
- Cardiovascular instability: Bradycardia or tachycardia, mottled skin, poor skin perfusion, oliguria, and hypotension
- Skin manifestations such as sclerema and petechial rash
- Respiratory signs: apneic episodes, tachypnea, increased oxygen requirement, grunting and chest retractions
- Gastrointestinal symptoms could be present in the form of poor sucking, feed intolerance, abdominal distension, and jaundice
- Neurological manifestations: Lethargy, hypotonia, irritability and seizures
- Sometimes the signs may be localized, like ear discharge, skin pustules, bone or joint swelling or umbilical discharge
- Severe sepsis manifests with multi-organ dysfunction that includes respiratory failure, pulmonary hypertension, cardiac failure, circulatory collapse, acute kidney injury, liver dysfunction, bone marrow dysfunction (neutropenia, thrombocytopenia, anemia), and disseminated intravascular coagulation

### **Other considerations –**

- Treat the underlying cause
- A sick neonate presenting with shock or on assisted ventilation, second line antimicrobials could be initiated directly
- Need of inotropes
- Respiratory support – CPAP/Mechanical Ventilation
- High-end antibiotics



### • **Renal failure requiring dialysis (Acute Kidney Injury)**

(Respective detailed PMJAY guidance documents can be reviewed for more information)

Indications of renal replacement therapy are:

- Hyperkalemia refractory to medication
- Hyponatremia with volume overload (pulmonary edema, severe hypertension)
- Metabolic acidosis ( $\text{TCO}_2 < 16\text{-}18 \text{ mEq/L}$ )
- Hypocalcemia
- Hyperphosphatemia refractory to therapy
- Inability to provide adequate nutrition due to fluid restriction

The two purposes of renal replacement are ultrafiltration (removal of water) and dialysis (removal of solutes). Peritoneal Dialysis (PD) is a process of removal of plasma solutes by diffusion down their concentration gradient across a semi permeable membrane. Filtration involves removal of protein free plasma across a membrane by convection.

### **Complications of PD**

PD is invasive procedure and the following complications/contraindications need to be remembered.

- The chief complication of PD is peritonitis, the common organisms being coagulase negative Staphylococcus, S. aureus and gram-negative bacteria
- Catheter related bleeding, catheter malfunction, perforation of abdominal viscera, adhesion of catheter tip to momentum
- Hyperglycemia can occur when higher concentrations of dextrose are used
- PD cannot be done in babies with necrotizing enterocolitis, babies who underwent abdominal surgery and in those with severe respiratory compromise as it may worsen with abdominal distension. This may be circumvented with smaller volume cycles
- Hypothermia must be prevented by using pre-warmed dialysis fluid. PD will be less effective in poor cardiac output or gut hypo perfusion

### • **Inborn errors of metabolism**

(Respective detailed PMJAY guidance documents can be reviewed for more information)

Inborn errors of metabolism (IEM) are disorders in which there is a block in the normal metabolic pathway that is caused by a genetic defect of a specific enzyme.

## Clinical Presentation

Severe illness in the newborn, regardless of the underlying cause, tends to manifest with non-specific findings such as poor feeding, drowsiness, lethargy, hypotonia, and failure to thrive. IEM should be considered in the differential diagnosis of any sick neonate presenting with one or more of these features along with more common causes such as sepsis, hypoxic ischemic encephalopathy, duct-dependent cardiac lesions, congenital adrenal hyperplasia and congenital infections.

### Clinical pointers for suspicion of IEM<sup>2</sup>

- Deterioration after a period of apparent normalcy
- Parental consanguinity
- Family history of neonatal deaths
- Rapidly progressive encephalopathy and seizures of unexplained cause
- Severe metabolic acidosis
- Persistent vomiting
- Peculiar odor
- Acute fatty liver or HELLP (hemolysis, elevated liver enzymes & low platelet counts) during pregnancy: seen in women carrying fetuses with long-chain-3-hydroxyacyl-coenzyme dehydrogenase deficiency (LCHAD)

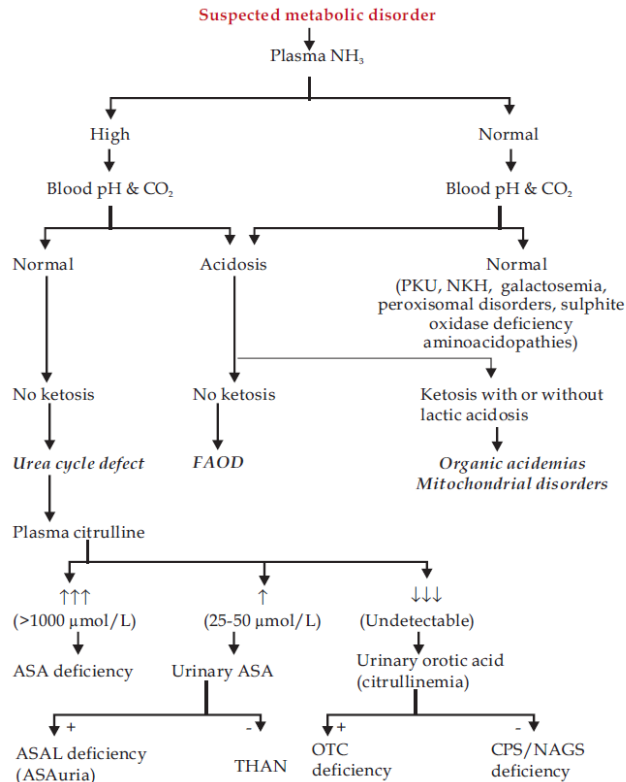
### : Clinical pointers towards specific IEM

Clinical finding	Disorder
Coarse facies	Lysosomal disorders
Cataract	Galactosemia, Zellweger syndrome
Retinitis pigmentosa	Mitochondrial disorders
Cherry red spot	Sphingolipidosis
Hepatomegaly	Storage disorders, urea cycle defects
Renal enlargement	Zellweger syndrome, Glycogen storage disorder type I
Eczema/alopecia	Biotinidase deficiency
Abnormal kinky hair	Menke's disease
Decreased pigmentation	Phenylketonuria

## Investigations

Metabolic investigations should be initiated as soon as the possibility is considered.

## Approach to Newborn with suspected metabolic disorder



(FAOD: fatty acid oxidation defects, PKU: Phenylketonuria, NKH: Nonketotic hyperglycinemia, ASA: Argininosuccinic acid, OTC: Ornithine transcarbamoylase, CPS: carbamoylphosphate synthetase I; NAGS: N-acetylglutamate synthetase, THAN: transient hyperammonemia of newborn, ASAL: argininosuccinic acid lyase)

## Treatment

In most cases, treatment needs to be instituted empirically without a specific diagnosis. The metabolic screen helps to broadly categorize the patient's IEM (e.g, urea cycle defect, organic academia, congenital lactic acidosis, etc.), based on which empirical treatment can be instituted. Specific treatment is based on diagnosis.

## Aims of treatment

- 1) To reduce the formation of toxic metabolites by decreasing substrate availability (by stopping feeds and preventing endogenous catabolism)
- 2) To provide adequate calories
- 3) To enhance the excretion of toxic metabolites
- 4) To institute co-factor therapy for specific disease and also empirically if diagnosis not established
- 5) Supportive care - treatment of seizures (avoid sodium valproate – may increase ammonia levels), ensure euglycemia and normothermia, maintain fluid, electrolyte and acid-base balance, and appropriate treatment of infections and mechanical ventilation, if required.

### 1.3 STANDARD TREATMENT WORKFLOW (DHR-ICMR STW)<sup>i</sup>- For clinicians/ treating doctor

<https://stw.icmr.org.in/stws>

### 1.4 Mandatory documents- For healthcare providers

Following documents should be uploaded by the concerned hospital staff at the time of pre-authorization and claims submission:

Mandatory document	Advanced Neonatal Care Package
<b>i. At the time of Pre-authorization</b>	
Clinical notes including evaluation findings and planned line of management	Yes
<b>Babies with birthweight of 1200-1499 g</b> <b>Mandatory</b> Ballard scoring Birth weight Gestation age Respiratory support - Silverman score need for Surfactant/Chest X-ray/CPAP/MV Retinopathy of Prematurity (ROP) screening (can be discharged – First ROP screening venue/date should be documented on the discharge summary to be done before 30 days of age and <2kg weight) Neurosonogram <b>Optional (based on Etiology)</b> Total Parenteral Nutrition (TPN) – based on availability 2D ECHO (Patent Ductus Arteriosus) Need for NSG – ventricular dilatation Need for PDA closure - Paracetamol/Ibuprofen/Indomethacin X-ray erect abdomen, USG Abdomen, stool for occult blood (Necrotizing Enterocolitis) Septic screen (Sepsis) Total Serum Bilirubin (Jaundice) Complete Blood count (anemia of prematurity) Serum Calcium/Electrolytes/Alkaline Phosphatase /Parathyroid hormone – (osteopenia of prematurity) Caffeine administration – (Apnea of prematurity) GERD - (GERD study/barium swallow) Hearing assessment Thyroid profile	Yes
<b><u>Any condition requiring invasive ventilation longer than 24 hours</u></b>	Yes

<b>Mandatory</b> Chest X-ray Arterial Blood Gas analysis Pre & post ductal saturation (pulse oximetry) <b>Optional</b> EEG Septic screen 2DECHO	
<b><u>Hypoxic Ischemic encephalopathy (HIE) requiring Therapeutic Hypothermia</u></b> <b>Mandatory</b> Complete blood count Electrolytes/Renal function test Coagulation profile Liver function test Arterial blood gases (ABG) Cranial Ultrasonography HIE scoring <b>Optional</b> Amplitude integrated electro-encephalography (aEEG) MRI Brain	Yes
<b><u>Cardiac rhythm disorders needing intervention</u></b> <b>Mandatory</b> Electrocardiogram (ECG) (Continuous ECG monitoring – Recommended) <b>Optional</b> 2DECHO – if suspicion of underlying heart defect	Yes
<b><u>Sepsis with complications such as meningitis or bone and joint infection, DIC or shock</u></b> <b>Mandatory</b> Chest X-ray Septic screen Blood Culture <b>Based on etiology</b> Cerebrospinal fluid (CSF) analysis - Meningitis Joint fluid analysis, X-ray and USG of the infected part - Bone or joint infection DIC or shock – Coagulation profile, procalcitonin	Yes
<b><u>Renal failure requiring dialysis</u></b> <b>Mandatory</b> Serum Creatinine Urine Output Blood urea Serum electrolytes	Yes



Arterial Blood Gas (ABG) Urine Sodium Urine Creatinine USG KUB region/Renal doppler <b>Optional</b> Voiding cysto-urethrography	
<b><u>Inborn errors of Metabolism</u></b> <b>First line investigations</b> <ol style="list-style-type: none"> <li>1) Complete blood count (neutropenia and thrombocytopenia seen in propionic and methylmalonic acidemia)</li> <li>2) Arterial blood gas and electrolytes</li> <li>3) Blood glucose</li> <li>4) Plasma ammonia (normal values in newborn: 90 to 150 µg/dL or 64 to 107 µmol/L)</li> <li>5) Arterial blood lactate (normal values: 0.5-1.6 mmol/L)</li> <li>6) Liver function tests</li> <li>7) Urine ketones</li> <li>8) Urine reducing substances</li> <li>9) Serum uric acid (low in molybdenum cofactor deficiency)</li> </ol> <b>Second line investigations (ancillary and confirmatory tests) – Based on Etiology and availability</b> <ol style="list-style-type: none"> <li>1) Gas chromatography mass spectrometry (GCMS) of urine</li> <li>2) Plasma amino acids and acyl carnitine profile by tandem mass spectrometry (TMS)</li> <li>3) High performance liquid chromatography (HPLC)</li> <li>4) Lactate/pyruvate ratio: in cases with elevated lactate.</li> <li>5) Urinary orotic acid</li> <li>6) Enzyme assay</li> <li>7) MRI</li> <li>8) Magnetic resonance spectroscopy (MRS)</li> <li>9) Electroencephalography (EEG)</li> <li>10) Plasma very long chain fatty acid (VLCFA) levels</li> <li>11) Mutation analysis when available</li> <li>12) CSF amino acid analysis</li> </ol>	
<b>ii. At the time of claim submission</b>	
Detailed Indoor case papers (ICPs)	Yes
Investigations reports (if done)	Yes
Detailed Procedure notes and indication (if any)	Yes
Detailed discharge summary	Yes

## **PART II: GUIDELINES FOR PROCESSING TEAM**

### **PART III: GUIDELINES FOR IT**

3.1 **Objective:** To enable setting up of cross check mechanisms / rule engines within the IT platform (TMS) to ensure compliance with STGs and to prevent fraud / abuse of the Health Benefit Package.

3.2 Below mentioned are the scenarios where a provision would be built in TMS for pop-ups:

#### **Babies with birthweight of 1200-1499 g**

- a. Was the birth weight documented 1200-1499 g? Yes/Not Applicable

#### **Any condition requiring invasive ventilation longer than 24 hours**

- a. Was ABG/Chest X-ray with ventilator settings at 24 hours report submitted? Yes/Not Applicable

#### **Hypoxic Ischemic encephalopathy requiring Therapeutic Hypothermia**

- a. Was the indication for therapeutic hypothermia documented? Yes/Not Applicable

#### **Cardiac rhythm disorders needing intervention (the cost of cardiac surgery or implant will be covered under cardiac surgery packages)**

- a. Was Electrocardiogram report submitted? Yes/Not Applicable

#### **Sepsis with complications such as meningitis or bone and joint infection, DIC or shock**

- a. Was CSF analysis/Aspiration of swelling, USG/X-ray of the part/coagulation profile/platelet report submitted? Yes/Not Applicable

#### **Renal failure requiring dialysis**

- a. Was the indication of dialysis requirement documented? Yes/Not Applicable

#### **Inborn errors of metabolism**

- a. Were Ammonia lactate/Blood sugar with urine ketones/Chest X-ray reports submitted? Yes/Not Applicable
- b. Documentation of poor feeding/level of consciousness/seizures/h/o IEM in the family/h/o unknown intellectual disability in sibling? Yes/Not Applicable

Till the time the functionality is being developed, the processing doctors shall check the above manually.

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**Acknowledgment:**

<sup>[1]</sup> Standard Treatment Workflows of India. 2019 Edition, vol. 1, New Delhi, Indian council of Medical Research, Department of Health Research, Ministry of Health and Family Welfare, Government of India. These STWs have been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit the web portal ([stw.icmr.org.in](http://stw.icmr.org.in)) for more information. © Indian Council of Medical Research and Department of Health Research, Ministry of Health & Family Welfare, Government of India.