



## Guidance Document for processing PM-JAY packages

### Plexus injury along with Vascular injury repair

Procedures covered: 2

Specialty: Polytrauma, Orthopedics, Neurosurgery, General Surgery

Package name	Procedure name	HBP 1.0 code	HBP 2.0 code	Package price (INR)	ALOS
Plexus injury along with Vascular injury repair / graft	Plexus injury along with Vascular injury repair	S600002	ST010A	60,000	10 days
Plexus injury along with Vascular injury repair / graft	Plexus injury along with Vascular injury graft	S600002	ST010B	60,000	10 days

#### Minimum qualification of the treating doctor:

**Essential:** MS/DNB/Equivalent in (General Surgery); MS/DNB/Equivalent in (Orthopedic surgery); MCh/DNB/Equivalent in (Neurosurgery / Reconstructive Surgery)

**Special empanelment criteria/linkage to empanelment module:** Functional Operational Theatre

#### Disclaimer:

For monitoring and administering the claim management process of **Plexus injury along with Vascular injury repair**, 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 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 any other relevant material as per the extant professional norms.

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

### **1.1 Objective:**

The purpose of this document 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:**

#### **Nerve Plexus Injury (NPI)**

Obtaining a thorough history in a patient with possible NPI is necessary to identify the injury mechanism, associated fractures, and other concomitant trauma to the neck, shoulder, and chest cage. Careful inspection of the patient can provide important clues to the extent of the injury. Considerable bruising and swelling may indicate deep trauma with possible vascular injury, which can be confirmed by evaluating the radial, ulnar, and brachial pulses. A detailed neurologic examination is warranted to ascertain the location of the lesion.

Findings on initial examination are supplemented with advanced imaging and electrophysiological evaluation to determine the prognosis of neurologic recovery further.

There are few contraindications to brachial plexus surgery. In general, surgery should be avoided if the patient is not medically or psychologically cleared for surgery or if local wounds or infections obstruct the surgical approach.

### **Management**

- The surgical timing for the treatment of nerve plexus injury remains a topic of controversy.
- Urgent surgical exploration of the plexus is indicated if a root avulsion or laceration injury to the plexus is suspected or in cases of open injury, retained foreign body, or vascular injury requiring vessel repair.
- Sharp transections of the brachial plexus allow for primary repair of the transected ends to optimize nerve regeneration.
- Prognosis for low-energy mechanism Brachial plexus injury is more favorable compared to root avulsions or preganglionic injuries and can be treated conservatively to allow for spontaneous recovery.
- The patient should be closely followed with serial examinations, imaging studies, and electrophysiological testing. Delayed exploration may be indicated at three to six months after injury if the patient fails to regain neurologic function satisfactorily.

### **PROTOCOL FOR VASCULAR INJURIES**

1. Reduce any fractures
2. Check for pulse
  - a. if pulses are palpable with good volume then continue serial monitoring, antioedema measures, reassess after 1 hour
  - b. if pulses are absent then check for other clinical signs of vascular compromise
  - c. rule out compartment syndrome then perform early fasciotomy and again reassess



- d. if clinical signs of vascular compromise are still positive then advise for emergency  
USG Doppler study of the extremity

### **USG Doppler study**

1. If normal – triphasic and normal flow, anechoic lumen then proceed with serial monitoring
2. If equivocal – biphasic flow, reduced flow then advise for CT ANGIOGRAM in doubtful cases
3. If absent – monophasic/absent flow, echogenic thrombus then EMERGENCY SURGERY

### **Peripheral Vascular Injury**

#### **Suspect peripheral vascular injury in:**

- Penetrating injury
  - Gunshot, stab injuries
  - Intravenous drug abuse
- Blunt trauma
  - Joint displacement, bone fracture or contusion adjacent to a major artery
- Invasive procedures
  - Arteriography
  - Cardiac catheterization
  - Balloon angiography

#### **Clinical manifestation**

- Hard signs of arterial injury (needs immediate surgery)
  - External arterial bleeding
  - Rapidly expanding hematoma
  - Palpable thrill, audible bruit
  - Obvious signs of arterial occlusion
    - Pain, pallor, pulselessness, paraesthesia, paralysis, poikilothermic
- Soft signs of arterial injury (consider arteriogram, serial examination, Doppler)
  - History of arterial bleeding at the scene

- Proximity of penetrating wound or blunt trauma to major artery
- Diminished unilateral distal pulse
- Small non-pulsatile hematoma
- Neurological deficit
- Abnormal ankle-brachial index ( $<0.9$ )
- Abnormal flow velocity waveform in Doppler USG

### **Physical examination**

- Palpable distal pulse - suggests proximal arterial injury is limited
- Serial examinations are mandatory

### **Diagnostic studies**

- To prevent unnecessary operation
- Document presence of surgical lesion
- Localize surgical lesion to plan operative management

#### **➤ Lesions**

- Contusion
- Partial transection
- Transection
- AV fistula

#### **➤ Duplex scan**

Real time B mode (Brightness) image and pulsed wave Doppler image (flow determination). It should be performed by a competent vascular technologist or surgeon.

### **Management**

#### **➤ Non-operative management**

- Appropriate for non-occlusive wall/intimal lesions
- Fasciotomy for compartment pressures  $> 30-35$  mm of Hg
- Suspect compartment syndrome if,
  - Prolonged period of shock or arterial occlusion



- Combined arterial + venous injuries
- Need for arterial /venous ligation
- Massive crush/ swelling is present
- Options for peripheral vascular repairs
  - Lateral arteriography/venography
  - Patch angioplasty
  - Resection with end to end anastomosis
  - Resection with interposition graft
  - Extra anastomotic bypass
  - Ligation
- Adjuvant therapies for limb salvage
  - Intraluminal shunts
  - Extra anastomotic bypass around associated soft tissue injury
  - Intraarterial vasodilators such as papaverine or tolazoline to reverse spasm
  - Intravenous low molecular weight dextran 500 ml every 12 hours
  - Thrombolytic therapy with intra-arterial tPA

### Post-operative care

- Monitor distal arterial pulses with portable Doppler unit
- Continue IV antibiotics for 24 hours if significant contamination of wound or if interposition graft has been inserted for arterial or venous repair.
- Consider use of antiplatelets for 3 months whenever vein graft or synthetic graft has been inserted.

### 1.3 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	Plexus injury along with Vascular injury repair	Plexus injury along Vascular graft

a. Clinical Notes detailing the injury and need for surgery	Yes	Yes
b. Medico legal case report/ FIR copy of accident, if the injury was due to accident	Yes	Yes
c. Nerve conduction velocity	Optional	Optional
d. Electromyography (EMG) report	Optional	Optional
e. MRI report	Optional	Optional
f. MR Angiography report/ color doppler report	Optional	Optional
<b>i. At the time of claim submission</b>		
a. Indoor case papers	Yes	Yes
b. Intra operative photograph	Yes	Yes
c. Procedure/ Operation notes	Yes	Yes
d. Detailed discharge summary	Yes	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:**

1. Were the clinical notes suggestive of nerve plexus injury and peripheral vascular injury?  
Yes

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

### **References**

1. Luo TD, Levy ML, Li Z. Brachial Plexus Injuries. [Updated 2020 Apr 23]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan-
2. Vascular Injury, Protocol for emergency and trauma care, Govt Medical College Thiruvananthpurampg43-52