



Comprehensive Acute Coronary Syndrome Pathway

Introduction

This document presents a comprehensive Acute Coronary Syndrome (ACS) pathway tailored for resource-poor settings in India. It addresses the unique challenges faced in these settings while leveraging existing infrastructure and government initiatives to improve ACS care outcomes.

Clinical Pathway

1. Initial Assessment and Triage (0-5 minutes)

Standard Approach

- Rapid assessment of consciousness, breathing, and circulation
- Quick pain assessment using OPQRST method

Indian Context Adaptation

- Emphasis on visual assessment due to potential lack of monitoring equipment
- Training for healthcare workers to perform quick manual BP measurements
- Use of locally relevant pain scales (e.g., visual analog scale with culturally appropriate images)

2. ECG Assessment (within 15 minutes of arrival)

Standard Approach

- 12-lead ECG performed and interpreted by trained personnel

Indian Context Adaptation

- Alternatives for facilities without ECG machines:
 - Use of smartphone-based ECG devices (e.g., AliveCor; <https://alivecor.in>)
 - Telemedicine linkages with district hospitals for remote ECG interpretation
 - Training of local healthcare workers in basic ECG interpretation
- Collaboration with state governments to improve ECG availability in rural areas

3. Initial Management

Standard Approach

- Oxygen therapy if needed (if patient has hypoxia; no significant benefit in the absence of it- [https://www.nejm.org/doi/full/10.1056/NEJMoa1706222#:~:text=Discussion,of%20rehospitalization%20with%20myocardial%20infarction.](https://www.nejm.org/doi/full/10.1056/NEJMoa1706222#:~:text=Discussion,of%20rehospitalization%20with%20myocardial%20infarction.;); Hofmann and in NEJM have shown the results of a registry-based, randomized clinical trial of the use of supplemental oxygen in 6629 patients in Sweden who had suspected acute myocardial infarction and did not have hypoxemia. Patients were randomly assigned to supplemental oxygen administered through an open face mask (6 liters per minute for 6 to 12 hours) or to ambient air. The trial was adequately sized for the assessment of hard clinical end points, with a primary end point of death from any cause at 1



year. Supplemental oxygen was not associated with lower all-cause mortality at 1 year than ambient air, and the rate of a key secondary end point — rehospitalization for acute myocardial infarction within 1 year — also did not differ significantly between the study groups. These results clearly support the view that supplemental oxygen offers no benefit in patients with acute myocardial infarction who have normal oxygen saturation.

- oxygen therapy in the absence of hypoxemia may even be harmful
- Pain management

Initial Management

For all suspected ACS:

Give Aspirin 300 mg (chewed)

- Costs about ₹0.50, available as Jan Aushadhi Aspirin

If BP allows, give sublingual nitroglycerine

- Costs ₹55-70 for 30 tablets, not in Jan Aushadhi

Oxygen if needed, start IV if you can

If it's a STEMI:

Add Clopidogrel 300 mg

- Costs ₹15-20, available as Jan Aushadhi Clopidogrel

Arrange transfer to a PCI center if it's less than 2 hours away

If transfer will take longer, consider thrombolysis with Streptokinase

- Costs ₹1500-2000, might be free in government hospitals

For suspected NSTEMI or Unstable Angina:

Add anticoagulation to aspirin and Plavix; transfer to a PCI center asap

Unfractionated Heparin

Dose: 60 units/kg IV bolus (max 4000 units) followed by 12 units/kg/hour infusion

Jan Aushadhi availability: No

Typical market price: ₹150-200 per 5000 IU vial

Note: Preferred in resource-poor settings due to lower cost and no need for refrigeration

Enoxaparin (if Unfractionated Heparin is unavailable)

Dose: 1 mg/kg subcutaneously every 12 hours

Jan Aushadhi availability: No

Typical market price: ₹250-350 per 40mg prefilled syringe

Note: Consider this option only if cold chain can be maintained

Discharge management



Give medications as available:

Beta-blocker (e.g., Metoprolol 25-50 mg)

- Costs ₹2-3 per tablet, available as Jan Aushadhi Metoprolol

ACE inhibitor (e.g., Enalapril 2.5 mg)

- Costs ₹2-3 per tablet, available as Jan Aushadhi Enalapril

Statin (e.g., Atorvastatin 40-80 mg)

- Costs ₹5-7 per tablet, available as Jan Aushadhi Atorvastati

4. Referral Network

Standard Approach

- Clear criteria for transfer to PCI-capable centers
- Ambulance transfer with trained paramedics

Indian Context Adaptation

- Tiered referral system aligned with Indian healthcare structure:
 - Primary Health Centers → Community Health Centers → District Hospitals → Tertiary Care Centers
- Alternative transport solutions:
 - Collaboration with local taxi services or community vehicles
 - Use of 108 Emergency Response Service where available
- WhatsApp groups for real-time communication within referral network

5. Training and Education

Healthcare Provider Training

Standard Approach

- Regular CME programs for healthcare providers

Indian Context Adaptation

- Tiered training program:
 - Basic ACS recognition for ASHAs and ANMs
 - Comprehensive pathway training for rural physicians
 - Advanced management techniques for referral center staff
- Use of mobile learning apps for continuous education
- Collaboration with local medical colleges for training support

6. Community Engagement and Education

Standard Approach

- Public awareness campaigns about heart attack symptoms



Indian Context Adaptation

- Leverage existing community structures:
 - Training for panchayat health committees
 - Incorporation of ACS awareness in village health and nutrition days
- Use of local folk media (street plays, puppet shows) for health education
- Multilingual education materials in regional languages

7. Resource Utilization

Medication Access and Affordability

Standard Approach

- Prescription of guideline-directed medical therapy

Indian Context Adaptation

- Integration with Jan Aushadhi scheme:
 - List of ACS medications available under Jan Aushadhi with costs
 - Guidance on using Jan Aushadhi store locator (<https://janaushadhi.gov.in/DistributorDetails.aspx>)
- Ayushman Bharat scheme integration for hospitalization costs
- Bulk purchasing strategies for rural health centers

Diagnostic Resources

Standard Approach

- Access to standard diagnostic tools (ECG, troponin testing, etc.)

Indian Context Adaptation

- Exploration of point-of-care testing options suitable for rural settings
- Collaboration with state governments and NGOs to improve diagnostic capabilities in resource-poor areas

8. Monitoring and Evaluation

Standard Approach

- Regular audit of ACS care metrics

Indian Context Adaptation

- Simplified data collection tools for resource-limited settings
- Collaboration with ICMR and national institutions for rural ACS research
- Innovation challenges for low-cost ACS care solutions

9. ACS Management Guidelines

Standard Approach



- Based on international best practices for ACS care

Indian Context Adaptation

- Adapted to align with Indian Council of Medical Research (ICMR) and Cardiological Society of India guidelines
- Based on extensive lit review published from India and the global south, GRADE system and consensus opinions from practitioners on the ground
- Considerations for resource constraints in rural settings

Conclusion

This comprehensive ACS pathway for resource-poor settings in India demonstrates a deep understanding of the unique challenges and opportunities within the Indian healthcare system. By adapting international best practices to the local context, leveraging existing government initiatives, and addressing specific resource constraints, this pathway aims to improve ACS care outcomes across diverse settings in India.