**Acute coronary syndrome: Early discharge planning**

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**Recommended Practice**

The following are to be met prior to patient discharge:

1. The patient does not have ischemic pain.
2. The patient is hemodynamically stable.
3. The patient has completed the in house education and activity program. The plan should include advice on lifestyle changes that will reduce the risk of further cardiac events including:
   - quitting smoking,
   - good nutrition,
   - moderating alcohol intake,
   - regular physical activity
   - and weight management.
4. Discharge medications are assessed for appropriateness in terms of reason for use and dosage.
5. Discharge medications are reviewed with the patient/family: reasons for use, of each medication, potential side effects, and appropriate times of administration.
   The patient has received a discharge prescription for:
   - Nitroglycerin,
   - Antiplatelet agent(s),
   - beta-blocker,
   - ACE Inhibitor,
   - and lipid lowering agent.
6. Patients are risk stratified appropriately according to patient’s condition and standards of care as local instructions.
7. Stress tests to be arranged by the physician responsible for the patient’s care at 4-6 weeks post discharge.
8. If evidence of chronic heart failure, left ventricular assessment should be done prior to patient discharge.
9. The patient is aware of and the referral to cardiac rehabilitation consultation has been arranged within 2 weeks of discharge.
10. An inpatient psychological screening is done to identify those patients who require a more formal outpatient mental status assessment and behavioral treatment planning following hospital discharge.

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**Summary**

**Question**

What is the best evidence regarding the safety of early discharge of patients with acute coronary syndrome (ACS) who have undergone primary percutaneous coronary intervention (PPCI)?

**Clinical Bottom Line**
Acute coronary syndromes (ACS), including unstable angina (UA) and myocardial infarction (MI) with or without ST-segment elevation, are life-threatening disorders that remain a source of high morbidity and mortality despite advances in treatment. ACS management includes treating evolving acute ST-segment elevation myocardial infarction (STEMI), and preventing the progression of UA and non-ST-segment elevation myocardial infarction (NSTEMI) into acute STEMI and death, by hospitalization and the use of antiplatelet and anticoagulant therapy, either alone or combined with early revascularization. Percutaneous coronary intervention (PCI) is generally recommended for patients with either STEMI or NSTEMI/UA. ACS can lead to both mortality and morbidity during and after hospitalization, with 30% of discharged patients needing rehospitalization within 6 to 15 months.

- A study retrospectively analyzing 15-month follow-up of patients with ACS after primary PCI, found that a total of 31.2% patients were rehospitalized for cardiovascular (CV)-related events, of which 59.3% were revascularization procedures and 58.4% for PCI again. (Level 3)
- A post hoc study analyzed the characteristics of length of stay (LOS) of patients with STEMI after primary PCI. The most important factors of LOS longer than 2 days were older age (51-70 years old), having an intra-aortic balloon pump (IABP) inserted, cardiogenic shock, and receiving any blood transfusions. (Level 3)
- A randomized controlled trial evaluated the feasibility and safety of early hospital discharge in low-risk STEMI patients treated with primary or rescue PCI. Patients in the intervention group were assigned to early discharge and received outpatient follow-up with an advanced practice nurse and the treating physicians managed discharge planning and follow-up of patients in controlled group. The results showed that there were no differences in death, rehospitalization, rates of medication compliance, smoking cessation, attendance at cardiac rehabilitation, or quality of life between the two groups, and the median LOS was 55 hours for both groups. The authors concluded that for low-risk STEMI patients treated with primary or rescue PCI, a strategy of early hospital discharge facilitated by advanced practice nurse follow-up was feasible. (Level 1)
- A prospective cohort study also evaluated the feasibility and safety of early hospital discharge in low-risk STEMI patients treated with primary or rescue PCI. The inclusion criteria of patients included Thrombolysis in Myocardial Infarction (TIMI) III flow in the infarct-related artery, left ventriculogram (LV) ejection fraction > 40%, rhythmic and hemodynamic stability, absence of heart failure and absence of severe comorbidity. Patient follow-up was for a median of 2.8 years. Readmission rates for non-major adverse cardiac events (MACE) (including heart failure, troponin negative chest pain syndromes and chest infections) in the first 30 days were 4.8%, 4.9% and 4.6% for patients discharged 2 days, 3 days and > 3 days after admission, respectively. The authors concluded that discharge of low-risk patients at 2 days after successful PPCI was feasible and safe. (Level 3)
- A prospective study also assessed the safety of early hospital discharge in low-risk STEMI patients treated with primary or rescue PCI. Patients with TIMI III flow in the infarct-related artery and without hemodynamic or arrhythmic complications were enrolled for early discharge. During a mean follow up of 584 days, 4.3% patients of the early discharge group died, and 12.3% patients of the late discharge group died. By a multiple logistic regression, the absence of following conditions were recognized as predictors of early discharge: peripheral vascular disease (PVD), cardiogenic shock on presentation, anterior myocardial infarction, radial or femoral PPCI access, multivessel or left main stem disease (LMS), cardiac arrest, any in-hospital complication, admission creatinine > 120 mmol/l, troponin exceeding sample median (troponin T exceeding 33.12 μg/l or and troponin 1 exceeding 1639 ng/l). The authors concluded that early discharge of low-risk STEMI patients within 2 days following PPCI were safe. (Level 3)
- A meta-analysis found no evidence that same-day discharge in selected patients following PCI was inferior to routine overnight observation in terms of composite death, myocardial infarction, or target lesion revascularization. However, no conclusion can be drawn because the meta-analysis used non-inferiority designs and larger, randomized trials are required to establish safety with same-day discharge. (Level 4)
- A prospective study examined the effect of the combined use of ischemic and bleeding risk scoring to guide antiplatelet therapy after ACS. The Global Registry of Acute Coronary Events (GRACE) model and the American College of Cardiology/American Heart Association guidelines (CRUSADE) were used. Patients with either low GRACE or high CRUSADE risk scores were stratified either to clopidogrel therapy (n=520) or ticagrelor (n=1,203). A further 1,652 patients were not risk scored and treated with clopidogrel therapy. Risk scores versus non-risk scored and ticagrelor versus clopidogrel treated patients were compared. The primary endpoint was major adverse cardiac events (MACE). The study found that using appropriate risk scoring to guide antiplatelet therapy after ACS compared with no risk scoring resulted in improved MACE outcomes.
This summary is based on a structured search of the literature and selected evidence-based health care databases. Evidence in this summary is from:

- A comprehensive literature review including 267 references.  
- An evidence based guidelines developed by American College of Emergency Physicians; Society for Cardiovascular Angiography and Interventions. 
- A retrospective cohort study with 6,687 ACS patients who underwent PCI. 
- A retrospective study with 115,113 STEMI patients after PPCI. 
- A randomized controlled trial including 54 low risk STEMI patients after PPCI. 
- A prospective cohort study including 1,309 low risk STEMI patients after PPCI. 
- A prospective study including 2,448 STEMI patients after PPCI. 
- A meta-analysis of 12,803 patients within 37 studies consisting of seven RCTs and 30 observational studies. 
- A sequential analysis trial of the seven RCTs used in the above meta-analysis. 
- A prospective study including 3,374 patients.

**Best Practice Recommendations**

- The decision to discharge a patient after PPCI for ACS should depend on the clinical judgment of the managing healthcare team and represents a balance between the patient's current clinical state and the risk of short-term adverse events. (Grade B)
- Early discharge of low-risk STEMI patients within 2 days following PPCI is safe and feasible. (Grade B)
- Early discharge is not considered for patients with peripheral vascular disease, cardiogenic shock, anterior myocardial infarction, radial or femoral PPCI access, multivessel or left main stem disease, cardiac arrest, any in-hospital complication, high admission creatinine, or increased troponin levels. (Grade B)
- Risk scoring to guide antiplatelet therapy may result in improved clinical outcomes compared with no risk scoring. (Grade B)

**References**
