CLINICAL PATHWAY

Heart & Vascular Health

Non-ST-Segment-Elevation Myocardial Infarction

CHRISTIANA CARE HEALTH SYSTEM
Non-ST- Segment- Elevation Myocardial Infarction

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INTRODUCTION

This clinical pathway supports optimal care of patients experiencing non-ST-elevation acute coronary syndromes by standardizing the process of clinical care based on available best evidence, and by reducing the risk of harm that may occur due to unnecessary variations in clinical care.

Scope of this Pathway

The NSTEMI pathway begins with the onset of symptoms in the hospital setting and subsequent identification of cardiac necrosis and diagnosis of NSTEMI or unstable angina. This includes patients presenting in the Emergency Department and in the Same Day Clinic.

Phase 1 pathway efforts focus on admission through seven days post-acute discharge. Phase 2 will focus on the care and status of pathway patients one year post initial admission to include readmissions, secondary prevention and clinical management.

Exclusions: STEMI patients, Type II MI Patients (MI from ischemia due to either O2 demand or supply), In hospital admissions with an NSTEMI post initial admission.
Pathway Contacts

The content of this pathway is developed and maintained by the Heart & Vascular Health line of Christiana Care Health System. Questions or feedback about the content may be directed to:

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**AHA/ACC 2014 Guidelines Level 1a Recommendation**

PATHWAY ALGORITHMS

ALGORITHM 1: DIAGNOSIS & EARLY HOSPITAL CLINICAL PATHWAY OUTLINE 0-6 HOURS POST ARRIVAL/ONSET OF SYMPTOMS

NSTEMI Diagnosis & Early Hospital Clinical Pathway Outline 0-6 Hours Post Arrival/Onset of Symptoms

**AHA/ACC 2014 Guidelines Level 1a Recommendation**

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Role Key:
- ED Triage RN
- ECG Tech
- ED Attending
- Cardiologist
- Advanced Practice Clinicians
- Cath Team
- Case Management

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**AHA/ACC 2014 Guidelines Level 1a Recommendation**
ALGORITHM 2: IN HOSPITAL CLINICAL PATHWAY OUTLINE

NSTEMI Pathway In Hospital Clinical Pathway Outline

Patient Placed on NSTEMI Pathway via Chest Pain/MI order Set OR Singleton Order in Power chart

**AHA/ACC 2014 Guidelines Level Ia Recommendation**

Cardiologist
Advanced Practice Clinicians
Complete TIMI Score in Power chart & Utilize in Strategy Decision: Ischemia Guided or Invasive

Cardiologist
Advanced Practice Clinicians
Initiate 1A Recommended Therapies

Case Mgmt
Unit RN
Begin Outpatient Pharmacy process

Unit RN
AMI & Medication Education

In Hospital Therapies/Treatments Complete?

NO

Cardiologist
Advanced Practice Clinicians
Case Mgmt
Unit RN
Continue In hospital management

YES

Cardiologist
Advanced Practice Clinicians
Case Mgmt
Unit RN
Phase II: Outpatient Management

Discharge planning:
- 7 day Follow Up Appointment made
-Meds at Outpatient Pharmacy for Pick Up
-Cardiac Rehab Consult Complete

Unit RN
Case Mgmt
Cardiologist
Advanced Practice Clinicians

Role Key
ED Triage RN
ECG Tech
ED Attending
Cardiologist
Advanced Practice Clinicians
Unit RN
Cath Team
CV Surgeon
Case Mgmt
## TABLE 1: DAY # 1/2 ADMISSION TO INPATIENT UNIT/CSSU

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>PATIENT OUTCOMES</th>
<th>ASSESSMENT/MEASUREMENTS</th>
<th>CONSULTS</th>
<th>DIAGNOSTICS/LABORATORY</th>
<th>MEDICATIONS</th>
<th>TREATMENTS/INTERVENTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PATIENT OUTCOMES</td>
<td>Hemodynamically stable.</td>
<td>System assessment every 8 hours.</td>
<td>Cardiac rehab phase 1.</td>
<td>Echocardiogram to evaluate EF.</td>
<td>Obtain an accurate list of home medications.</td>
<td>Cardiac monitor.</td>
</tr>
<tr>
<td></td>
<td>Patient tolerating activity level.</td>
<td>Vitals including O2 sats every 4 hours.</td>
<td>Social work/case management for d/c planning.</td>
<td>EKG on admission and as needed during episode of chest pain.</td>
<td>Anticoagulation.</td>
<td>IV access.</td>
</tr>
<tr>
<td></td>
<td>Absence of chest pain and unstable arrhythmias.</td>
<td>Strict intake and output.</td>
<td>Chaplin/priest as needed.</td>
<td>Comprehensive metabolic profile, MG, CBC, troponin, lipid profile, PTT, BNP, HGA1C</td>
<td>Aspirin.</td>
<td>Oxygen only if oxygen saturation &lt;90%.</td>
</tr>
<tr>
<td></td>
<td>Absence of bleeding.</td>
<td>Assess anxiety and intervene as necessary.</td>
<td></td>
<td>as appropriate.</td>
<td>Beta blockers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Assess for bleeding (bleeding precautions).</td>
<td></td>
<td></td>
<td>Statin.</td>
<td></td>
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<tr>
<td>ASSESSMENT/MEASUREMENTS</td>
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<tr>
<td>CONSULTS</td>
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<td>MEDICATIONS</td>
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<td>TREATMENTS/INTERVENTIONS</td>
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<tr>
<td>FLUIDS/NUTRITION</td>
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</tbody>
</table>

- **Hemodynamically stable.**
- **Patient tolerating activity level.**
- **Absence of chest pain and unstable arrhythmias.**
- **Absence of bleeding.**

- **System assessment every 8 hours.**
- **Vitals including O2 sats every 4 hours.**
- **Strict intake and output.**
- **Assess anxiety and intervene as necessary.**
- **Assess for bleeding (bleeding precautions).**

- **Cardiac rehab phase 1.**
- **Social work/case management for d/c planning.**
- **Chaplin/priest as needed.**

- **Echocardiogram to evaluate EF.**
- **EKG on admission and as needed during episode of chest pain.**
- **Comprehensive metabolic profile, MG, CBC, troponin, lipid profile, PTT, BNP, HGA1C as appropriate.**

- **Obtain an accurate list of home medications.**
- **Anticoagulation.**
- **Aspirin.**
- **Beta blockers.**
- **Statin.**

- **Cardiac monitor.**
- **IV access.**
- **Oxygen only if oxygen saturation <90%.**

- **Cardiac; add carbohydrate controlled if diabetic.**
- **NPO if planned for cardiac catheterization; may have clear liquids up to 2 hours prior to procedure if time of procedure known.**
<table>
<thead>
<tr>
<th>PROCESS</th>
<th>PSYCHOSOCIAL SUPPORT/EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Orientation to unit and procedures.</td>
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<td>Introduce patient pathway and plan of care.</td>
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<td></td>
<td>Patient safety teaching (to call for CP and assistance for bed side commode, bed exit alarms)</td>
</tr>
<tr>
<td></td>
<td>Teaching checklist: (Day 1: GetWellNetwork: What Is A Heart Attack &amp; The Angiography Procedure – What To Expect; Exit Care: MI Easy To Read Christiana Care; Formulary Leaflets For New Medications &amp; Exit Care Medications After a Heart Attack; Medication Teaching On Beta Blockers, Statin, Asa, ACE/ARB; with each medication administration).</td>
</tr>
</tbody>
</table>

| DISCHARGE PLANNING | Begin discharge planning by assessing home care needs. |
|                    | Assess discharge criteria daily. |

**TABLE 2: DAY # 2/3**

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>PATIENT OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absence of unstable arrhythmias and chest pain.</td>
</tr>
<tr>
<td></td>
<td>Absence of bleeding.</td>
</tr>
<tr>
<td></td>
<td>Absence of access site complication.</td>
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<tr>
<td></td>
<td>Patient reports improvements in their condition.</td>
</tr>
<tr>
<td></td>
<td>Patient able to verbalize day 1 and 2 teaching material.</td>
</tr>
</tbody>
</table>

| ASSESSMENT/MEASUREMENTS | Routine vital signs if appropriate. |
|                       | System assessment every 8 hours. |
|                       | Assess anxiety and intervene as necessary. |
|                       | Access site assessment per order post cardiac catheterization. |

| CONSULTS | Cardiac rehab. |
|          | Nutrition as needed. |
|          | Cardiovascular surgery if MVD on cardiac catheterization. |

| DIAGNOSTICS/LABORATORY | Labwork as needed (BMP, lipids, PTT if on heparin) |
|                       | Cardiac catheterization. |
|                       | Ultrasound le/carotids if for CABG. |

| MEDICATIONS | Addition of ace/arb if EF <40%. |
|             | Anticoagulation with heparoinds d/c after revascularization – continue if CABG planned this admission. |

| TREATMENTS/INTERVENTIONS | Cardiac monitor. |
|                         | IV access. |

<p>| FLUIDS/ | Cardiac; carb controlled added if diabetic. |</p>
<table>
<thead>
<tr>
<th>PROCESS</th>
<th>NUTRITION</th>
<th>MOBILITY/ ACTIVITY</th>
<th>PSYCHOSOCIAL SUPPORT/ EDUCATION</th>
<th>DISCHARGE PLANNING</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUTRITION</td>
<td>NPO if planned for cardiac catheterization; may have clear liquids up to 2 hours prior to procedure if time of procedure known.</td>
<td>Bedrest if groin access.</td>
<td>Teaching checklist Day 2: Myocardial infarction, Medications Reinforcement, Exit Care – Dual Antiplatelets, Groin Site/Radial Site Care; GetWellNetwork: the Benefits of Cardiac Rehabilitation &amp; After A Heart Attack At Discharge; medication education with each medication administration; gwn video-; smoking cessation creating a plan if applicable; after a heart attack taking nitroglycerin; symptoms of heart attack common to women. medication education with each medication administrations. reinforce prior education CABG (if MVD present).</td>
<td>Discharge planning: home care, VNA visit, placement needs. Schedule 7 day discharge appointment and add to discharge instructions.</td>
</tr>
</tbody>
</table>
# TABLE 3: DISCHARGE CRITERIA

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>DISCHARGE CRITERIA</th>
</tr>
</thead>
</table>
| PERFORMANCE INDICATORS   | ACE inhibitor prescribed at d/c or contraindication documented.  
Beta blocker prescribed at d/c or contraindication documented.  
Dapt prescribed at d/c.  
Statin prescribed at d/c or contraindication documented.  
Echocardiogram completed and EF recorded.  
Smoking cessation advice/counseling completed.  
Discharge instructions re: accurate discharge meds, symptoms of recurrent heart attack, dapt, when to call MD.  
7 day follow-up appointment made. |
| ASSESSMENTS/OUTCOMES     | No chest pain or other symptoms of MI.  
Blood pressure within stable limits after introduction of new medications.                                                                                                                                            |
| DIAGNOSTICS/LABORATORY   | Electrolytes within normal limits.  
Stable renal function.                                                                                                                                                                                                  |
| MEDICATIONS              | Oral meds stable x 24 hours  
Patient verbalizes understanding of meds and able to teachback.                                                                                                                                                        |
| MOBILITY/ACTIVITY        | Patient tolerating activity without chest pain  
Phase 1 cardiac rehab consult complete.                                                                                                                                                                               |
| PSYCHOSOCIAL SUPPORT/EDUCATION | Patient verbalizes understanding of symptoms of heart attack, when to call physician/come to hospital, medication regimen and able to teachback.                                                                         |
| DISCHARGE PLANNING       | Follow-up appointments with Cardiology, Cardiac Rehab, VNA.  
30-day supply of new medication available in outpatient pharmacy.                                                                                                                                                  |
### PATIENT EDUCATION MATERIALS

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>ADMISSION/DAY 2</th>
<th>DAY2/3</th>
<th>DISCHARGE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Get Well Network Videos</strong></td>
<td>• “What is a Heart Attack? Video”.</td>
<td>• “Taking Nitroglycerin Video”.</td>
<td>Follow Up on Outstanding</td>
</tr>
<tr>
<td></td>
<td>• “The Angiography Procedure Video”.</td>
<td>• “Benefits of Cardiac Rehabilitation Video”.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “My Medications”.</td>
<td>• “My Medications”.</td>
<td></td>
</tr>
<tr>
<td><strong>Exit Care Materials</strong></td>
<td>• “Cardiology Cardiac Catheterization Christiana Care (Custom)”.</td>
<td>• “HVIS Dual Antiplatelet Therapy Christiana Care (Custom)”.</td>
<td>Follow Up on Outstanding</td>
</tr>
<tr>
<td></td>
<td>• “HVIS AMI Pathway Christiana Care (Custom)”.</td>
<td>• “HVIS Groin Site Care (Custom)”.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• “HVIS Medications Prescribed after a Heart Attack.”</td>
<td>• “Radial Site Care”.</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>• “Cardiac Rehabilitation”.</td>
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<tr>
<td></td>
<td></td>
<td>• “Smoking, You Can Quit, Easy-to-Read”.</td>
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</tbody>
</table>
CLINICAL EDUCATION MATERIALS

- NSTEMI Pathway Education for Nurses (PowerPoint).
- Heart & Vascular Service Line Implementation of the NSTEMI Clinical Pathway (PowerPoint).
- NSTEMI Clinical Pathway Nursing Checklist
REFERENCES

• 2014 AHA/ACC Guideline for the Management of Patients with Non-ST-Elevation Acute Coronary Syndromes

• Intermountain Healthcare Guidelines for Diagnosis and Management of ACS

• Possible Cardiac Chest Pain Clinical Pathway-Queensland Government

• Early versus Delayed Invasive Intervention in Acute Coronary Syndromes

• Care Redesign-A Path Forward for Providers

• Early Medication Nonadherence after Acute Myocardial Infarction: Insights into Actionable Opportunities from the Treatment with ADP receptor inhibitors: Longitudinal Assessment of Treatment Patterns and Events after Acute Coronary Syndrome (TARNSLATE-ACS) Study

• Effect of Nicotine Replacement Therapy on Cardiovascular Outcomes After Acute Coronary Syndromes

• The Picker Patient Experience Questionnaire: development and validation using data from in-patient surveys in five countries

• Discharge Counseling for Patients with Heart Failure or Myocardial Infarction: A Best Practice Model Developed by Members of the American College of Clinical Pharmacy's Cardiology Practice and Research Based Network Based on the Hospital to Home (H2H) Initiative

• AHA/ACCF Secondary Prevention and Risk Factor Reduction Therapy for Patients with Coronary and Other Atherosclerotic Vascular Disease

• 2013 AHA/ACC Guideline on Lifestyle Management to Reduce Cardiovascular Risk
# ACKNOWLEDGEMENTS

**Physician Champion:** Henry Weiner, MD  
**Project Manager:** Leslie Mulshenock, MBA  
**Implementation Team:**  
Matt Esham, Laura Dechant, Danielle Coyne, Prathibha Krishna Reddy  
**Team Member/Participants:**

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<th>Donna Casey</th>
<th>Laura Zizza</th>
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<td>Sharon Urban</td>
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<td>Christie Williams</td>
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THE CHRISTIANA CARE WAY

We serve our neighbors as respectful, expert, caring partners in their health. We do this by creating innovative, effective, affordable systems of care that our neighbors value.