Case Study: Mary J.

- A 72-year-old white female with a past medical history significant for atrial fibrillation, congestive heart failure, and multiple cardiac arrests presents to the ED on day 5 of her skilled nursing stay after being found unresponsive.

- On arrival to the ED her BP is 80/40mmHg, her HR is 160 bpm and irregular and she is 88% saturated on 100% face mask.
On Admission…

Patient admitted from hospital via stretcher. Patient is 72 year old white female who is s/p exacerbation of CHF secondary to an MI. She is alert and oriented X3. She denies pain at this time. She denies SOB. No distress noted. Her BP is 140/74, HR 87. Oxygen at 2L via nasal cannula. Pulse ox 95%. 16FR foley draining light yellow urine. Lung sounds are clear. ABG round non-tender non-dilated. Bowel sounds present of normal. Mild non-pitting edema noted to BLE which resolve when feet elevated in bed. Admission weight is 129lbs.
Day 2 - Friday

Day 2 03:37 Skilled Nursing Note

Day 2 15:19 General Progress Note
- VS 156/78, 88, 88, 92%, on 4l/n/c. Pt stated that her pain was managed throughout shift. All meds & tx tolerated.

Day 2 21:29 General Progress Note
- VS 140, 88, 95%. Alert and oriented x3. Able to make needs known. Assist x1, with ox. Wound on foot x1 on w/s.

Day 3 - Saturday

Day 3 15:54 General Progress Note
- Pt c/o of increased fatigue and SOB after therapy. Patient returned to bed. VS 148/73, 82, 86, 90% on 4l/n/c. Physician notified. Order additional dose of Lasix 40mg x1 now and increased Lasix to 40mg p.o. BID.

Day 3 17:29 General Progress Note
- Pt’s daughter in to visit and update on pt’s condition. Pt reports that she is feeling better after resting but she is not hungry and has refused her evening meal. Daughter asked when the doctor would be in to see her mother and was told that he normally rounds on Tuesdays. Daughter asked that the doctor call her.

Day 4 - Sunday

Day 4 07:53 Weekly Weight Note
Weekly weights noted at 135.2lbs. Will review with weight team.

Day 4 14:53 Skilled Nursing Note
- Patient ate 50% of her meals today and refused therapy. VS 110/80, 90, 94%, 90%. She appears comfortable but says she feels like she is getting a cold. Resp even and unlabored. O2 per NC. No respiratory distress noted. Pt answered today. Daughter updated.
Day 5 - Monday

Day 5 00:07 Skilled Nursing Note
- Patient alert, oriented x3, sitting up in chair without complaint of pain/discomfort.
- Foley draining yellow urine.

Day 5 07:48 General Progress Note
- Foley cath d/c'd; tbl. well. Color of urine in bag looked somewhat orange, clear.
- No c/o discomfort.

Day 5 13:57 Skilled Nursing Note
- Pt remained very lethargic throughout am. Pt stated she was very tired. Pt looked very pale. Pt O2 stats were 80-85%. Pt breathing was labored. Lungs sound were congested with high pitched rhonchi upon expiration. Pt expressed that she had chest tightness & congestion & that she was very thirsty. Glucose level was WNL. Patient became increasingly less responsive. MD was called with symptoms & overall update on Pt. Orders were given to send pt to ER. Family was notified.

DAY 5: 9:15pm

- A 72 year old white female with a past medical history significant for atrial fibrillation, congestive heart failure, and multiple cardiac arrests presents to the ED on day 3 of her skilled nursing stay after being found unresponsive.

- On arrival to the ED her BP is 80/40mmHg, her HR is 160bpm and irregular and she is 88% saturated on 100% face mask.

Preventable?
Studies on Rehospitalization

- Within 30 days of hospitalization 23.5% of all SNF Medicare beneficiaries are rehospitalized.
- 90% of rehospitalizations within 30 days appear to be unplanned, the result of clinical deterioration.
- MedPAC estimates that up to 76 percent of those re-hospitalizations may be preventable, representing a potential savings to Medicare of over $12 billion in one year.
- Only half of the patients rehospitalized within 30 days had a physician visit before readmission.
- Of the Medicare beneficiaries who are re-hospitalized within 30 days, 64% receive no post-acute care between discharge and readmission.
- 19% of Medicare discharges are followed by a “preventable” adverse event within 30 days—2/3 are medication related.

The NEW Quality Measure

Why Do Patients Get Stuck in the Revolving Door of HealthCare?
Rehospitalization Prevention Opportunities

- At 24-48 Hours
  - Transition of Care
- At Day 3-7
  - Initial Assessment
- At Day 8-30
  - Communication

30 Day Thresholds

Rehospitalization Prevention Initiatives

- At 24-48 Hours
  - Transition of Care
- At Day 3-7
  - Initial Assessment
- At Day 8-30
  - Communication
Transition of Care Initiatives
24-48 Hours - Transition

- Clinical Skills Inventory
- Transition of Care Nurse to Nurse Report

Clinical Skill Inventory

[Table with columns and rows indicating clinical skills and their ratings]

[Image of a form labeled "HCA Hospital Care"]

[Image labeled "PROOF"]
Transition of Care Initiatives  
3-7 Days - Medical Practice

- Initial Visit Window
- Frequency of Visits
- Individualized Diagnosis Specific Treatment Protocols

Rehospitalization from PAC  
Patient Diagnostic Profile - 2014

- 78 year old white female
  - Primary Reason for Rehospitalization Diagnosis:
    - Cardiac – 28%
    - Pulmonary – 24%
    - Neurologic – 17%
    - Fever – 12%
    - Gastrointestinal – 8%
    - Orthopedic – 8%
    - Other – 3%

Evidenced-Based Diagnosis Specific Protocols

- Congestive Heart Failure
- Chronic Obstructive Pulmonary Disease
- Cerebrovascular Accidents
Heart Failure

- Fastest growing clinical cardiac disease in the United States.
- Approximately 670,000 new cases of heart failure are diagnosed each year.
- About 277,000 deaths are attributed to heart failure each year.
- The most frequent cause of hospitalization in patients over 65 years.

Risk of CHF Rehospitalization

Cardiovascular Function
Anatomy of Ventricular Failure

- **Systolic failure**: causes ventricle not to empty properly (most common cause of CHF)
  - Heart muscle has decreased ability to contract
  - Also caused by increased afterload (hypertension), or mechanical abnormalities (like valvular heart disease)
  - Characterized by low forward blood flow
Anatomy of Ventricular Failure

- **Diastolic failure**: causes ventricle not to fill properly
  - Disorder of heart relaxation and ventricular filling
  - Usually the result of ventricular hypertrophy
  - Caused by chronic hypertension, aortic stenosis, or cardiomyopathy
  - Commonly seen in older adults

**Diastolic Failure**

- Thick heart walls are a sign of Diastolic Failure

**Types of CHF**

- **Left sided failure**
  - Back up of blood into the lungs
  - Common causes are: CAD, HTN, cardiomyopathy and rheumatic heart disease
  - Other causes can be: MI damage, ischemia, scar tissue (reducing contractility),
Types of CHF

- Right sided failure
  - Backup of blood into the venous system and right side of the heart
  - Primary cause is left sided failure
  - Also caused by Cor pulmonale (caused by COPD, and pulmonary emboli)
  - Also caused by MI damage, ischemia and scarring

Pathophysiology of HF

- Vasoadhesion
- Release of ET-1 and Vasopression
- Release of Norepinephrine
- Demolished Contractility
### Neurohormonal Effects in HF

<table>
<thead>
<tr>
<th>Response</th>
<th>Short-Term Effects*</th>
<th>Long Term Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salt and water retention</td>
<td>Augments preload to increase cardiac output</td>
<td>Pulmonary congestion and peripheral edema</td>
</tr>
<tr>
<td>Vasoconstriction</td>
<td>Maintains blood pressure for perfusion of vital organs</td>
<td>Exacerbates pump dysfunction (increased cardiac afterload and energy expenditure)</td>
</tr>
<tr>
<td>Sympathetic stimulation</td>
<td>Increases heart rate and ejection (increased output)</td>
<td>Increases energy expenditure and causes arrhythmias</td>
</tr>
<tr>
<td>Cardiac hypertrophy</td>
<td>Adaptive: increased sarcomere number with increased cardiac output</td>
<td>Maladaptive: accelerated cell death, arrhythmias</td>
</tr>
</tbody>
</table>

*Table 1. Homeostatic Responses to Impaired Cardiac Performance (Due in part to activation of the renin-angiotensin-aldosterone system (RAAS) and of the sympathetic nervous system."

### Signs and Symptoms

- **Angina**
- **Tachycardia**
  - Palpitations
- **Venous Congestion**
  - Edema, Orthopnea
- **Low Cardiac Output**
  - Dyspnea
  - Fatigue
  - Decreased Appetite
  - Nocturia or Oliguria
  - Cerebral Symptoms
Mainstay of CHF Therapy

- Improves Survivability
- Decreases Disease Progression
- Decreases CHF Readmissions

Weekly Titration to Maximize Benefit
- ‘Start low and go slow’
- Titrate Ace-I, wean diuretic

Monitor Labs and Side Effects

CHF – ACE-I Dosing Schedule

<table>
<thead>
<tr>
<th>Drug</th>
<th>Initial dosage (mg)</th>
<th>Targeted dosage</th>
<th>Maximal dosage</th>
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<td>Enalapril (Vasotec)</td>
<td>2.5 to 5</td>
<td>10 mg twice daily</td>
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CHF – Cardiac Medication Review
Evidence Based Approach

- Loop Diuretics (NYHA II, III, IV)
- Digoxin (Variable evidence)
- ACE-I (Strong evidence)
- ARBs (Limited evidence)
- B-Blockers (NYHA II, III)
- Spironolactone (RALES)
- NSAIDS (negative effect)
- Calcium Channel Blockers (PRASES)

New York Heart Association (NYHA) Classification of Heart Failure

<table>
<thead>
<tr>
<th>Class</th>
<th>Patient Symptoms</th>
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<tbody>
<tr>
<td>Class I (NH)</td>
<td>No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).</td>
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<tr>
<td>Class II (Mild)</td>
<td>Slight limitation of physical activity. Comfortable at rest, but ordinary physical activity results in fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).</td>
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<tr>
<td>Class III (Moderate)</td>
<td>Marked limitation of physical activity. Comfortable at rest, but less than ordinary physical activity results in fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea).</td>
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<tr>
<td>Class IV (Severe)</td>
<td>Unable to carry on physical activity without discomfort. Symptoms of fatigue, rapid/irregular heartbeat (palpitation) or shortness of breath (dyspnea) are present at rest. If any physical activity is undertaken, discomfort increases.</td>
</tr>
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</table>

Ongoing Assessment

- History
  - NYHA Functional Classification
  - Angina
  - Cough
- Physical Examination
  - Low SBP
  - Edema
  - Dribble
  - Anemia
  - CRT
  - Echo-cardiogram
COPD

- Third leading cause of death in the United States.
- The most underdiagnosed and undertreated disease process in the world.
- Second leading cause of disability. Approximately 32 Million individuals in the United States claim disability secondary to COPD.
- The third most frequent cause of 30 day rehospitalizations.
Types of CHF

• Right sided failure
  – Backup of blood into the venous system and right side of the heart
  – Primary cause is left sided failure
  – Also caused by Cor pulmonale (caused by COPD, and pulmonary emboli)
  – Also caused by MI damage, ischemia and scarring

24-48 Hour Checklist

- 2G Na Diet
- Vital Sign Parameters
- Database
  - ABG
  - CBC
  - Chem 7
- COPD Medication Review
  - Steroid Therapy
  - Long Acting B2 Adrenergic Agonist
  - Short Acting B2 Adrenergic Agonist
  - Long Acting Anti-cholinergic
  - Short Acting Anti-cholinergic
  - Phosphodiesterase type 4 Inhibitor
  - Leukotriene Receptor Antagonist
  - Antibiotics
COPD Medication Review
Evidence Based Approach

- Corticosteroid (Strong Evidence)
- A long acting B2 adrenergic agonist (Salmeterol)
- A short acting B2 agonist (Albuterol)
- A long acting anticholinergic – (Tiotropium – Spiriva) decrease airway tone and increase airflow
- A short acting anticholinergic – (Ipratropium- Atrovent)
- Phosphodiesterase type 4 inhibitor (PDE4) an immune cell mediator antiinflammatory (Variable Evidence) (Roflumilast - Daliresp)
- Antibiotics (Strong evidence)

Ongoing Assessment

- History
- Risk factors
- Associated morbidities
- Physical Examination
- Pneumonia Severity Index
- Database
- Spirometry
- Sputum Culture
- COPD Medication Review
- DVT Prophylaxis

Pneumonia Severity Index

Step 1 without score

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Step 2 with scoring

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Risk of Mortality

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Blood tests & Pulmonary

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Total Score

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Mortality

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Stroke

- Fourth most common cause of death
- Leading cause of neurologic disability
- Accounts for 50% of patients hospitalized with a neurologic disability
- Most common diagnostic impairment group in inpatient rehabilitation units
- Leading cause for admission to the nursing home or extended care facility

Stroke

A sudden onset of focal neurologic deficits due to the presumed local disturbance of blood supply to the brain
Pathogenesis

Thromboembolic
- Embolic
- Thrombotic
- Lacunar

Hemorrhagic
- Intracerebral
- Subarachnoid

Motor Impairments

- Motor Weakness - 90%
  - R Hemiparesis - 45%
  - L hemiparesis - 35%
  - B Hemiparesis - 10%
- Dysarthria - 50%
- Sensory Deficits - 50%
- Cognitive -35%
- Aphasia - 35%
- Depression - 30%
- Bladder incontinence - 30%
- Dysphagia - 30%
- Visuoperceptual deficits - 30%
- Hemianopsia - 25%
- Ataxia - 20%
Medical Post Stroke Complications

- Malnutrition
- Aspiration
- DVT
- Anxiety
- Depression
- Pneumonia
- Cardiac complications
- Sexual dysfunction
- Seizures
- Pressure ulcers
- Bowel and bladder dysfunction
- Falls

Transition of Care Initiatives
Stroke

24-48 Hour Checklist

- DASH Diet
- Vital Sign Parameters
- Database
  - CBC
  - Blood Glucose
  - Bladder Parameters
  - Venous Doppler
- Stroke Medication Review
  - Oxygen
  - B-Complex Vitamins
  - Antiaggregants - ASA
  - Anticoagulation
  - Anti-hypertensives
  - Cholesterol and Lipid lowering medications

Stroke Medication Review
Evidence Based Approach

- B-Complex Vitamins (Limited evidence)
- Platelet Antiaggregants (Strong evidence)
  - ASA
  - Ticlopidine
  - Clopidogrel
  - Dipyridamole (ESPS-2 and ESPRIT)
- Anticoagulants (Variable evidence)
- HMG-CoA Reductase Inhibitors (Strong evidence)
- Antihypertensives (Strong evidence)
  - ACE-I
<table>
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**CHF – ACE-I Dosing Schedule**

**Ongoing Assessment**

- History
- Risk factors
- Associated morbidities
- Physical Examination
- NIH Stroke Scale
- Outcome Predictors
- Stroke Medication Review
- DVT Prophylaxis
- Neurostimulants
- SSNRI
- Anticonvulsant Therapy
- Antispasticity Agents
- Bowel and Bladder Management
- Education

**NIH Stroke Scale**
Early Warning Sign and Symptoms

- SBAR
- Critical Thinking Pathways

Transition of Care Initiatives
8-30 days - Communication

- SBAR
- Early Warning Sign and Symptoms
- Critical Thinking Pathways
Quality Care Initiatives

- Clinical Skills Inventory
- Transition of Care Nurse-to-Nurse Report
- SBAR support
- Individualized Diagnosis Specific Treatment Checklist and Protocols
- Alert Review
- Care Path Utilization

The NEW Quality Measure