Surgical Care Improvement Project (SCIP) began as a national quality partnership committed to improving patient safety by driving down postoperative complications by 25% by 2010. By implementing SCIP quality measures, it is estimated that hospitals can prevent an estimated 13,000 patient deaths and 271,000 surgical complications each year (*AORN J 86 (July 2007)94-101)*. SCIP is a national priority of the Institute of Healthcare Improvement (IHI) 10,000 lives Campaign, a focus for The Joint Commission and The Centers for Medicare and Medicaid Services (CMS). SCIP continues to be an area with an opportunity for improvement at UHS facilities. Improvement in the quality of perioperative care delivery can be evidenced by achieving and sustaining 100% in all SCIP measures.

The SCIP measures include:

A. Antibiotic Prophylaxis:

1.) Antibiotic received within one hour prior to surgical incision, SCIP INF 1

2.) Appropriate Antibiotic selection for surgical patients, SCIP INF-2 and

3.) the Prophylactic Antibiotics discontinued within 24 hours after surgery time, 48 hours for CABG and other cardiac surgery. SCIP INF-3

B. Cardiac surgery patients with controlled 6am postoperative serum glucose (≤ 200 mg/dL) on post-op day 1 and 2.

C. Surgery patients with appropriate hair removal. No hair removal, or removal with **clippers** or depilatory is considered appropriate, with few exceptions.

D. Colorectal surgery patients with immediate normothermia (≥96.8 °F) within the first hour after leaving operating room.

E. Surgery patients on Beta Blocker Therapy prior to admission who received a Beta Blocker during the perioperative period (prior to leaving the post operative acute care unit (PACU) or within six hours for those not recovered in the PACU).

F. Venous Thromboembolism (VTE) Prophylaxis :

1.) Surgery patients with recommended VTE prophylaxis ordered,

2.) Surgery patients who receive appropriate VTE prophylaxis within 24 hours prior to surgery to 24 hours after surgery.

Type of Surgery	Beta Blocker Recommendation
For Patients without a documented contraindication, who take a beta-blocker prior to surgery, a beta blocker should be used perioperatively to reduce the incidence of post-operative atrial fibrillation.	
Common Beta Blockers	• Bisoprolol • metopolol tartrate • propranolol
For patients without contraindications who are undergoing noncardiac surgery and are currently on beta-blocker therapy, a beta-blocker should be used during the perioperative period For patients who are undergoing non-cardiac procedures,and NOT on a beta blocker prior to surgery, the evidence for the perioperative initiation of a beta-blocker for the prevention of perioperative outcomes is conflicting.	

Zynx References: Yup, sk., Tait, G., Karkaoit, K., Wijeysundera, D., McCluskey, S. Beattie, W.S., The Safety of perioperative esmolol: a systematic review and meta-analysis of randomized controlled trials. Anesth Analg. 2011;112:267-81; Bangalore S, Wetterslev J, Pranesh S, Sawhney S, Gluud C, Messerli FH. Perioperative beta blockers in patients having non-cardiac surgery: a meta-analysis. Lancet. 2008;372:1962-76. Beattie WS, Wijeysundera DN, Karkouti K, McCluskey S, Tait G. Does tight heart rate control improve beta-blocker efficacy? An updated analysis of the noncardiac surgical randomized trials. Anesth Analg. 2008;106:1039-48, table of contents.

Surgical Care Improvement Project (SCIP) Continued

Type of Surgery	Antimicrobial Recommendation
CABG, other Cardiac or Vascular	**Single Agents:** CeFAZolin 1-2 gm IV or CefurOXime or Vancomycin. ***If* ß-Lactam Allergy:** Clindamycin 600-900 mg IV or Vancomycin 1 g IV. **If known history of MRSA:** Vancomycin 1 g IV or Clindamycin
Colon	**Single Agents:** CefOXitin 1-2 g IV. Cefotetan, Ampicillin sulbactam or ertapenem; **Combination regimen** MetroNIDAZOLE 500 mg IV ***and*** CeFAZolin or cefuroxime **If ß-Lactam Allergy:** Clindamycin ***and*** aminoglycoside or Quinolone or aztreonam or Aminoglycoside ***and*** MetroNIDAZole or Quinolone ***and*** MetrNIDAZole
General Surgery (hepatectomy gastrectomy)	**Single Agent:** CeFAZolin 1g IV **If ß-Lactam Allergy:** MetroNIDAZole 500 mg IV ***and*** Ciprofloxacin 400 mg IV
Other General Surgical Procedures (e.g. hernia repair, breast)	**Single Agent:** CeFAZolin 1-2 g IV. **If ß-Lactam Allergy:** Clindamycin 600-900 mg IV ***or*** Vancomycin 1 g IV. **If known history of MRSA:** Vancomycin 1 g IV
Gynecological Procedures (e.g. hysterectomy -is included in SCIP)	**Single Agent:** ceFAZolin 1 g IV, Cefoxitin 1-2 g IV, cefotetan or cefurOXime; **If c-section and group B Strep prophylaxis:** ceFAZolin, ampicillin or penicillin **If ß-Lactam Allergy:** MetroNIDAZole 500 mg IV ***and*** Aminoglycoside, MetroNIDAZole ***and*** clindamycin or Quinolone or Clindamycin ***and*** aztreonam
**** if Hysterectomy with colon surgery**	**Single Agent:** Cefoxitin 1-2 g IV, ceFAZolin, cefotetan or cefurOXime or ampicillin/sulbactam or ertapenem **If ß-Lactam Allergy:** MetroNIDAZole 500 mg IV ***and*** Aminoglycoside, Clindamycin and Aminoglycoside or Clindamycin ***and*** aztreonam or MetroNIDAZole and Quinolone
Neurosurgery	**Single Agent:** CeFAZolin 1-2 g IV. **If ß-Lactam Allergy:** Clindamycin 600-900 mg IV **or** Vancomycin 1 g IV. **If known history of MRSA:** Vancomycin 1 g IV
Orthopedic: Hip/Knee Arthroplasty	**Single Agent:** CeFAZolin 1-2 g IV. Or CefurOXime or vancomycin **If ß-Lactam Allergy:** Clindamyin 600-900 mg IV or Vancomycin 1 g IV. **If known history of MRSA:** Vancomycin 1 g IV

American Academy of Orthopaedic Surgeons, American Association of Critical Care Nurses, American Association of Nurse Anesthetists, American College of Surgeons, American College of Osteopathic Surgeons, American Geriatrics Society, American Society of Anesthesiologists, American Society of Colon and Rectal Surgeons, American Society of Health-System Pharmacists, American Society of PeriAnesthesia Nurses, Ascension Health, Association of periOperative Registered Nurses, Association for Professionals in Infection Control and Epidemiology, Infectious Diseases Society of America, Medical Letter, Premier, Society for Healthcare Epidemiology of America, Society of Thoracic Surgeons, Surgical Infection Society. Antimicrobial prophylaxis for surgery: an advisory statement from the National Surgical Infection Prevention Project. Clin Infect Dis 2004 Jun 15;38(12):1706-15. [90 references] PubMed Edwards FH, Engelman RM, Houck P, Shahian DM, Bridges CR, Society of Thoracic Surgeons. The Society of Thoracic Surgeons Practice Guideline Series: Antibiotic Prophylaxis in Cardiac Surgery, Part I: Duration. Ann Thorac Surg 2006 Jan;81(1):397-404. PubMed

Surgical Care Improvement Project (SCIP) Continued

Surgery & Level of Risk	Recommended VTE Prophylaxis
General surgery, moderate – high risk (Open surgical procedure > 30 minutes requiring in hospital stay > 24 hours post-op)	•Any of the following: Low-dose Unfractionated Heparin (LDUH) 5000units bid or tid • Low Molecular Weight Heparin (LMWH) •Factor Xa Inhibitor • LDUH or •LMWH combined with Intermittent Pneumatic Compression (IPC) or Graduated Compression Stockings (GCS).
General surgery with high risk for bleeding (based on ***physician*** *documentation* of bleeding risk) Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op	Any of the following: • GCS • IPC Of note is the recommendation that IPCs be worn 23 hours a day to be effective
Gynecologic surgery - Open surgical procedure > 30 minutes and requiring hospital stay > 24 hours post-op	Any of the following: • LDUH 5000 units bid or tid •LMWH •IPC •LDUH •Factor Xa Inhibitor or •LMWH combined with IPC or GCS
Urologic surgery - Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op	Any of the following: •LDUH 5000 units bid or tid •LMWH •IPC •GCS •Factor Xa Inhibitor •LDUH or •LMWH combined with IPC or GCS
Elective total hip replacement - Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op	Any of the following started within 24 hours of surgery: • LMWH •Factor Xa Inhibitor •Oral Factor Xa Inhibitor • Adjusted-dose Warfarin (INR target 2.5, range 2.0-3.0)
Elective total knee replacement - Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op	Any of the following started within 24 hours of surgery: • LMWH •Factor Xa Inhibitor •Oral Factor Xa Inhibitor • Adjusted-dose Warfarin (INR target 2.5, range 2.0-3.0)
Hip fracture surgery - Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op	Any of the following: • LMWH • LDUH • Factor Xa Inhibitor• Adjusted-dose Warfarin (INR target 2.5, range 2.0-3.0)
Hip fracture surgery or elective total hip replacement with high risk for bleeding (based on ***physician*** *documentation* of bleeding risk) Open surgical procedure > 30 minutes requiring in hospital stay > 24 hrs post-op	Any of the following: • GCS • IPC Of note is the recommendation that IPCs be worn 23 hours a day to be effective
Elective spinal surgery (With additional risk factors such as advanced age, known malignancy, presence of a neurologic deficit, previous VTE, or an anterior surgical approach) (Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op)	Any of the following: • LDUH • IPC • LMWH • GCS • IPC combined with GCS • LDUH or LMWH combined with IPC or GCS Of note is the recommendation that IPCs be worn 23 hours a day to be effective
Intracranial neurosurgery (Open surgical procedure > 30 minutes requiring hospital stay > 24 hours post-op)	Any of the following: • LMWH • IPC with or without GCS • LDUH • LDUH or LMWH combined with IPC or GCS

Patients who receive neuraxial anesthesia or have physician documented bleeding risk may pass the performance measure if appropriate pharmacologic or mechanical prophylaxis is ordered. http://ahrq.hhs.gov/qual/vtguide last accessed 01/03/12 *ACCP Guidelines. Preventing VTE in Hospitalized Patients: Progress and Remaining Challenges – Geerts (2011)* . *www.ahrq.gov/clinic/ptsafety* CMS SCIP _4.0

So What is Your Role? SCIP Adapted from the Stanford Best Practices Model

ROLE OWNER	DESCRIPTION
Anesthesiologists:	• Take pre-op antibiotics with patient from pre-op area • Start/administer ALL pre-op antibiotics in OR prior to surgical incision. • Document antibiotic name and administration time on Anesthesia Record • Document Beta Blocker assessment and time of last dose within 24 hours • Actively participate in "Time-out" • Verify Beta Blocker is given when appropriate before the patient transfers from the PACU to the unit or within six hours of surgery end time when patient is recovered in a unit other than the PACU.
Surgeons:	• Order appropriate antibiotics and discontinue within 24 hours after surgery, except cardiac surgeries (can be found above, in the CDC antibiotic stewardship guidelines, on the pre-printed Evidenced-based order sets, on the zynx tools, on the ACC and ATS and national SCIP Partnership, IHI and AHRQ sites & on the Sharepoint).. • Order Venous Thromboembolism (VTE) prophylaxis per guidelines (can be found on pre-printed Evidence-based order sets, zynx tools, ACCP VTE 7th Congress, ACS guidelines, IHI, AHRQ, & above, on this document) • If no antibiotic is indicated for surgery, please document in patient's chart. • If no chemical VTE prophylaxis order, please document contraindication, such as risk for bleeding.
Pharmacist	• Review all surgery patients medications prior to surgery; preferably from preadmission information when surgery is scheduled and surgeons orders are received, including prophylactic antibiotic and VTE prophylaxis. • If prophylactic antibiotic and/or VTE prophylaxis orders are not appropriate, contact the surgeon. • If prophylactic antibiotic is unit dose dispensed, release only the appropriate number of units/doses for the patient/case verify surgery end time with PACU Nurse– create a hard stop.
Proactive Chart Manager/Pre-admission Nurse: prior to day of surgery	• Check for antibiotic and VTE orders. • Notify surgeon's office if orders are missing or not complete. • Collect patient list of prescription, OTC and herbal medications • Send patient's medications list to pharmacy for review along with surgeon's orders
Pre-Op RN/ Holding Area	• If antibiotic section in pre-op order form is not complete, call Surgeon. • Obtain ordered pre-op antibiotic from Pyxis/pharmacy. Place on patient's chart with patient's label/hang the antibiotic on the pole prior to patient moving to the OR. • Check if VTE prophylaxis is ordered (SCDs and/or Heparin). • If no VTE prophylaxis is ordered, call MD.
OR RN	• Actively participate in "Time Out". Include review of prophylactic antibiotic start before incision
PACU RN:	• Verify surgery end time, antibiotic, VTE and beta blocker orders with pharmacist. • Administer antibiotic and VTE prophylaxis and beta blocker as needed. • Document in PACU report form and communicate to unit RN name of antibiotic and verify time of administration, VTE prophylaxis and beta blocker, if applicable, prior to patient leaving PACU
Unit RN:	• When getting report from PACU nurse, verify completion of documentation of antibiotic, VTE and beta blocker. • Verify time of last antibiotic dose in PACU report form. • Look in OR case record for the surgery end time. **• Ensure entire course of post-op prophylactic antibiotics are administered within 24 hours from Surgery end time, 48 hours for CABG.**

Community Acquired Pneumonia (CAP) is defined most often as pneumonia not acquired in a hospital or long-term care facility. Despite the availability of potent new antimicrobials and effective vaccines, an estimated 5.6 million cases of CAP occur annually in the United States. The estimated total annual cost of health care for CAP in the United States is $8.4 billion. According to the Centers for Disease Control and Prevention 2001 data, influenza and pneumonia were the seventh leading cause of death in the United States.

Evidence based practices supported by the American Academy of Family Practice, the Infectious Disease Society of America, the American Thoracic Society and others include:

- use of chest radiography when CAP is suspected,
- use of the Pneumonia Severity Index to assist in decisions regarding hospitalization or outpatient treatment,
- initial treatment with empiric and macrolides or doxycyline (Vibracycin) in most patients and
- use of respiratory fluoroquinolones when patients have failed first-line regimens, have significant comorbidities, have had recent antibiotic therapy, are allergic to alternative agents, or have a documented infection with highly drug-resistant pneumococci.

According to Dr. Paula Peyrani, pneumonia represents significant morbidity and mortality risks to patients, increased healthcare costs and potential risk to healthcare workers. In the APIC Guidelines, she defines components of an effective infection control program necessary to improve medical care and patient outcomes. The components, now included in public reporting, are:

- identifying the most likely etiology of the pneumonia,
- targeting and streamlining antimicrobial therapy,
- developing and implementing strategies to prevent development of pneumonia and
- ensuring the safety of other patients and healthcare workers through immunization and environment controls.

Collecting blood cultures prior to antibiotic administration offers the best hope of identifying the organism that caused sepsis in an individual patient. Failure to check blood cultures prior to antibiotic infusion will, perhaps affect the growth of any blood borne bacteria and prevent a culture from becoming positive later.

Studies show that the best way to consistently achieve key recommendations for practice and cost-saving approaches to the treatment of patients with CAP is by using a clinical pathway. Clinical pathways are a method of facilitating multidisciplinary patient care by moving processes of care sequentially through various stages, within specified time frames, toward a desired outcome. Pathways should be specific to each institution and patient, and encourage the use of the most active, cost-effective agents to produce rapid, positive clinical outcomes. Evidence of providing care that is consistent with the evidence based guidelines for patients with CAP can be shown by achieving 100% on the following measures:

1.Oxygen assessment
2.Blood culture drawn before the first dose of antibiotics is administered
3.First dose of antibiotics within six hours of arrival
4. Appropriate antibiotic selection
5. Influenza and pneumonia vaccination, and
6. Smoking cessation counseling
Outcome measure: 30 day mortality rate

Andrews J, Nadjm B, Gant V, Shetty N. Community-acquired pneumonia. *Curr Opin Pulm Med*. 2003;9:175–80.

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Mandell LA, Bartlett JG, Dowell SF, File TM Jr, Musher DM, Whitney C. Infectious Diseases Society of America. Update of practice guidelines for the management of community-acquired pneumonia in immunocompetent adults. *Clin Infect Dis*. 2003;37:1405–33.

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Fine MJ, Pratt HM, Obrosky DS, Lave JR, McIntosh LJ, Singer DE, et al. Relation between length of hospital stay and costs of care for patients with community-acquired pneumonia. *Am J Med*. 2000;109:378–85.

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The Pneumonia severity Index can serve as a general guideline for management. However, clinical judgement should always supersede a prognostic score.

Pneumonia Severity Index

Patient Characteristics Points

Demographics

Male	Age (years)
Female	Age (years) − 10
Nursing home resident	+ 10

Comorbid illness

Neoplastic disease	+ 30
Liver disease	+ 20
Congestive heart failure	+ 10
Cerebrovascular disease	+ 10
Renal disease	+ 10

Physical examination findings

Altered mental status	+ 20
Respiratory rate > 30 breaths per minute	+ 20
Systolic blood pressure < 90 mm Hg	+ 20
Temperature < 35˚C (95˚F) or > 40˚C (104˚F)	+ 15
Pulse rate > 125 beats per minute	+ 10

Laboratory and radiographic findings

Arterial pH < 7.35	+ 30
Blood urea nitrogen > 64 mg per dL (22.85 mmol per L)	+ 20
Sodium < 130 mEq per L (130 mmol per L)	+ 20
Glucose > 250 mg per dL (13.87 mmol per L)	+ 10
Hematocrit < 30 percent	+ 10
Partial pressure of arterial oxygen < 60 mm Hg or oxygen percent saturation < 90 percent	+ 10
Pleural effusion	+ 10

Total points:

Point total	*Risk*	*Risk Class*	*Mortality% (# of Patients)*	*Recommended Site of care*
No predictors	Low	I	0.1 (####)	Outpatient
< 70	Low	II	0.6 (####)	Outpatient
71 to 90	Low	III	2.8 (####)	Inpatient (briefly)
91 to 130	Moderate	IV	8.2 (####)	Inpatient
> 130	High	V	29.2 (####)	Inpatient

*The Pneumonia severity Index can serve as a general guideline for management. However, clinical judgement should always supersede a prognostic score.

The Centers for Medicare & Medicaid Services (2011) & The Joint Commission (2011) specify the following antimicrobials for adult patients hospitalized with CAP: Reference ZynxEvidence last minor update Dec 11, 2011; last major update Sept 12, 2010

Regimens by Patient Type	Specified Antimicrobials
Inpatient, Non-ICU IV or oral macrolide + IV or intramuscular beta-lactam ***Or*** IV or intramuscular beta-lactam + IV or oral doxycycline ***Or*** IV tigecycline monotherapy ***Or*** IV or oral antipneumococcal quinolone monotherapy	• Beta-lactams for inpatients not in the ICU include ampicillin/sulbactam • Carbapenems: ertapenem for inpatient, not ICU • Macrolides: clarithromycin, and azithromycin • Cephalosporins: Cefotaxime, ceftaroline • Quinolones: gemifloxan, levofloxan, moxifloxan • Tetracyclines: Doxycycline • Regimens: (cefTRIAXone, cefotaxime, ceftaroline, , or ertapenem) *and* Doxycycline or (Cefotaxime, cefTRIAXone, ceftaroline, ampicillin-sulbactam, or ertapenem) + (azithromycin or clarithromycin) or Gemifloxacin, levofloxacin, or moxifloxacin • Inpatient suspected MRSA: Vancomycin, clindamycin, linezolid
ICU Patients IV macrolide + (IV beta-lactam or IV antipneumococcal/antipseudomonal beta-lactam) ***Or*** IV antipseudomonal quinolone + (IV beta-lactam or IV antipneumococcal/antipseudomonal beta-lactam) ***Or*** IV antipneumococcal quinolone + (IV beta-lactam or IV antipneumococcal/antipseudomonal beta-lactam) ***Or*** IV antipneumococcal/antipseudomonal beta-lactam + IV aminoglycoside + (IV antipneumococcal quinolone or IV macrolide) ***Or*** For patients with Y pestis or F tularensis risk as determined by another source of infection, the following is also acceptable: IV doxycycline + (IV beta-lactam or IV antipneumococcal/antipseudomonal beta-lactam)	• Macrolides for inpatients in the ICU include **erythromycin and azithromycin** • Beta-lactams for inpatients in the ICU include **cefTRIAXone, cefotaxime, and ampicillin/sulbactam** • Antipneumococcal/antipseudomonal beta-lactams for inpatients in the ICU include **cefepime, imipenem, meropenem, piperacillin/tazobactam, and doripenem** • Antipneumococcal quinolones for inpatients in the ICU include **moxifloxacin and levofloxacin*** • Antipseudomonal quinolones for inpatients in the ICU include **ciprofloxacin and levofloxacin*** • Aminoglycosides for inpatients in the ICU include **gentamicin, tobramycin, and amikacin**
Inpatient, Non-ICU: at risk for P aeruginosa IV antipneumococcal/antipseudomonal beta-lactam + IV or oral antipseudomonal quinolone ***Or*** IV aminoglycoside + IV antipneumococcal/antipseudomonal beta-lactam + (IV or oral antipneumococcal quinolone or IV or oral macrolide) --- **Inpatient, Non-ICU: at risk for P aeruginosa with an allergy to beta-lactam** IV or intramuscular aztreonam + IV or oral antipneumococcal quinolone + IV aminoglycoside ***Or*** For patients with renal insufficiency: IV or intramuscular aztreonam + IV or oral levofloxacin*	• Antipneumococcal quinolones for non-ICU inpatients at risk for P aeruginosa include **moxifloxacin, levofloxacin*, and gemifloxacin** • Antipseudomonal quinolones for non-ICU inpatients at risk for P aeruginosa include **ciprofloxacin and levofloxacin*** • Antipneumococcal/antipseudomonal beta-lactams for non-ICU inpatients at risk for P aeruginosa include **piperacillin/tazobactam, meropenem, imipenem, cefepime, and doripenem** • Macrolides for non-ICU inpatients at risk for P aeruginosa include **erythromycin, azithromycin, and clarithromycin** • Aminoglycosides for non-ICU inpatients at risk for P aeruginosa **include tobramycin, gentamicin, and amikacin**
CAP Antimicrobial Alpha listing: Amikacin, ampicillin/sulbactam, Azithromicin, cefepime, cefTRIAXone, cefotaxime, ciprofloxacin, clarithromycin, cefepime, doripenem, erythromycin, ertapenem, gemifloxacin, gentamicin, gentamycin, imipenem , levofloxacin, meropenem, moxifloxacin, piperacillin/tazobactam, tobramycin	

So What is Your Role in Community Acquired Pneumonia ?

ROLE OWNER	DESCRIPTION
Triage Nurse:	•Complete 30-60 second respiratory distress assessment for common clinical symptoms of CAP including cough, fever, chills, fatigue, dyspnea, rigors, and pleuritic chest pain, fever >38 C (or 100.4 F) vs symptoms of heart failure or AMI. •Implement Pneumonia Triage protocol/guidelines if symptoms present. •Draw blood culture with first order for labs if not part of protocol and hold pending possible blood culture order •Pulse Oxymetry and vaccination status Assessment with vital sign and other assessement •Begin Pneumonia six hours to antibiotic count down clock
ED Physician:	•Complete physical examination •If pneumonia suspected, implement Pneumonia pre-printed/electronic order set for selection of: -chest radiography, labs, etc. *Listing for selection of appropriate antibiotics and guidelines for CAP can be found above, in the CDC antibiotic stewardship guidelines, on the pre-printed/electronic evidenced-based order sets, on www.Zynx.com , on the ATS, IHI and AHRQ web sites and the physician i-phone/droid software application.* •Determine risk class with *pneumonia severity index score
Pharmacist	•Review all medication orders for appropriateness prior to administration of the first dose. •Contact the physician if the antibiotic orders are not appropriate or a contraindication is noted. .
Proactive Chart Manager/ Case Manager – prior to discharge	•Check for vaccination and smoking cessation couseling status. •Notify physician if orders are missing or not complete, including influenza or pneumococcal vaccinations.
ICU RN:	•Review ED orders or assess and complete blood culture draw prior to first dose of antibiotic administration •Verify oxygen assessment if direct admit or inpatient transfer •Verify vaccination status and administer at first opportunity if needed •Verify smoking cessation counseling needs and provide at first opportunity if needed
Non-ICU Unit RN:	•When getting report from ED/ICU nurse, verify completion of vaccination status/need for influenza and/or pneumococcal vaccination, smoking cessation education counseling and complete at first opportunity if needed • Verify time of last dose of antibiotics in ED/ICU report. • Verify completion of education and immunizations prior to completion of discharge.
Attending/Primary Physician	•Complete physical examination •If pneumonia/pneumonia suspected,implement pneumonia pre-printed/electronic order set for selection of: -chest radiography, labs, etc. *Listing for selection of appropriate antibiotics and guidelines for CAP can be found above, in this document, in the CDC antibiotic stewardship guidelines, on the pre-printed/electronic evidenced-based order sets, on www.Zynx.com , on the ATS, IHI and AHRQ web sites and the physician i-phone/droid software application*. •Determine risk class with *pneumonia severity index score.

Congestive Heart Failure (HF) is a complex clinical syndrome that can result from any structural or functional cardiac disorder that impairs the ability of the ventricle to fill with or eject blood. It is characterized by dyspnea and fatigue secondary to structural and functional changes in the heart. Because not all patients have volume overload at

the time of initial or subsequent evaluation, the term “heart failure” is often preferred over the term “congestive heart failure.” It is not uncommon to see either term used.

The IHI 5 Million Lives Campaign, the National Partnership for Patients and multiple other studies show that the first job for hospitals is to reliably implement the in-hospital evidence-based interventions for heart failure. The next step is for hospitals to go beyond basic discharge planning and focus intensly on improving the transition of patients from hospital to ambulatory care in order to have a much greater impact on reducing rehospitalizations. Numerous studies have deomonstrated the benefits of assuring that every patient receives the right medications throughout hospitalization and discharge and ensuring that the patient understands and engages in appropriate follow up care, be that to home unassisted, to cardiac rehabilitation or something in between. Hospitals can play a pivotal role in both inpatient care and in initiating a strong post discharge ambulatory care plan.

Studies have established a firm evidence base indicating that specific components of heart failure care reduce morbidity and mortality. The following key care components should be provided to all patients with heart failure in the absence of contraindications or intolerance:

1. Left ventricular systolic (LVS) function assessment
2. ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for CHF patients with systolic dysfunction (Left Ventricular Ejection Fraction (LVEF) <40%)
3. Beta-blocker therapy at discharge for stabilized patients with left ventricular systolic dysfunction, without contraindications* .
4. Anticoagulant at discharge for CHF patients with chronic or recurrent atrial fibrillation
5. Smoking cessation advice and counseling
6. Discharge instructions that address all of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen
7. Influenza immunization (seasonal)
8. Pneumococcal immunization
   Outcome measure: Heart Failure 30 day mortality rate

*although strongly supported by the IHI Campaign and the AHA/ACC 2005 Guideline Update for the Diagnosis and Management of Chronic Heart Failure in adult patients, beta-blocker therapy at discharge is *not included* in the ACC/AHA Heart Failure Clinical Performance Measures or JCAHO and CMS Core Measures. It is one of the key performance measures in the AHA’s Get With the Guidelines –HFSM initiative.

Phillips CO, Wright SM, Kern DE, Singa RM, Shepperd S, Rubin HR. Comprehensive discharge planning with postdischarge support for older patients with congestive heart failure. *JAMA*. 2004; 291:1358-1367. Prevention of pneumococcal disease: Recommendations of the Advisory Committee on Immunization Practices (ACIP). *Morbidity and Mortality Weekly Report.* Apr 4, 1997;46(RR-08):1-24. ACC/AHA 2005 Clinical Performance Measures for Adults with Chronic Heart Failure. *Journal of the American College of Cardiology*. 2005;46:1145-1178. Fiore FE, Shay DK, Haber P, et al. Prevention and control of influenza: Recommendations of the Advisory Committee on Immunization Practices (ACIP), 2007. *Morbidity and Mortality Weekly Report.* Jul 13, 2007; 56(RR-06):1-54.

Common Cardiac Medications

Platelet Inhibitors: Salicylates
Aspirin

Angiotensin Converting Enzyme Inhibitors (ACE-I)
Captopril
Enalopril
Fosinopril
Lisinopril
Perindopril
Quinapril
Ramapril
Trandolapril

Angiotensin Receptor Blockers (ARB)
Candesartan
Losartan
Valsartan

www.zynx.com

Anticoagulants:
Bivalirudin
Fondaparinux
Low-Molecular Weight Heparins
Dalteparin or Enoxaprin
Unfractionated Heparin
Warfarin – Coumadin

Beta Blockers
Carvedilol
Metoprolol tartrate

Calcium Chanel Blockers
Diltizem
Verapamil

Cardiac Glycosides
Digoxin

Diuretics
Bumetidine
Furosemide
Torsemide

Lipid-Regulating Agents:
Bile Acid Sequestrants
Cholestyramine
Colesevelam
Colestipol

Cholesterol Absorption Inhibitors
Ezetimibe

Combination Agents
Vytorin
Fibric Acid Derivatives
Fenobirate
Fenobirate Micronized
Fenofibrate nanocrystallized
Fenofbric Acid

Lipid-Regulating Agents (con’t):
Gemfibrozil

HMG-CoA Reductase Inhibitors
Atorvastatin
Fluvastatin
Lovastatin
Pitavastatin
Pravastatin
Rosuvastatin

Nicotinic Acid Derivatives
Niacin
Omega-3 Fatty Acid Esters

Platelet Inhibitors: Thienopyridines
Clopidigrel
Prasugrel

Potassium supplements
Potassium chloride

So What is Your Role in Heart Failure?

ROLE OWNER	DESCRIPTION

Triage Nurse:	•Complete 30-60 second respiratory distress assessment for common clinical symptoms of Heart Failure including:*dyspnea at rest or on exertion; reduction in exercise capacity, orthopnea, paroxysmal nocturnal dyspnea (PND) or nocturnal cough, edema, ascites or scrotal edema and fatigue vs symptoms of pneumonia such as fever > 38 C (101.4 F) or AMI. •Implement heart failure Triage protocol/guidelines if symptoms present. •Notify radiology/echo tech of need for search for LVF results •Complete pulse oxymetry and assess vaccination status with vital signs and other assessement •Begin heart failure care plan
ED Physician:	•Complete physical examination and evaluation •If heart failure suspected, implement heart failure pre-printed/electronic order set for selection of: - chest radiography, routine labs including BNP or NT-proBNP level, lipid profile per & ECG- 2010 Comprehensive heart Failure Practice Guidelines*. *Guidelines for selections are on the pre-printed/electronic evidenced-based order sets, in the Zynx tools www.zynx.com , on the, IHI and AHRQ web sites and the physician i-phone/droid software application.*
Pharmacist	• Review all medication orders forcompleteness and appropriateness prior to administration of the first dose. Inpatient orders should include: ACE/ARB, Beta Blocker for those with LVEF < 40%; anticoagulant for those with A-fib. •Contact the physician if medication orders are not appropriate or a contraindication is noted. •Complete pharmacy-facilitated discharge rounding for medication review and patient/caregiver education at least once prior to patient discharge or transfer to other site of care to assure appropriate and complete discharge medications and help assure patient/caregiver understanding of medication regimen. • Complete pharmacy review of discharge medication orders to assure appropriateness and completeness of discharge medications. Contact physician if orders are missing, not appropriate or a contraindication is noted.
Proactive Chart Manager – Case Manager begin on admission	• Check for complete vaccination status or documentation of contraindications and smoking cessation education status. • Check discharge planning for complete education, medications and post discharge follow up care /transition of care to ambulatory plan, including follow up appointments • Notify physician if orders are missing or not complete for documentation of contraindications. • Verify LVEF results or scheduled test in chart. If not notify radiology/echo tech.
Radiology/Echo Tech	• Verify date of last echo/results of ejection fraction and availability of results in medical record. If no results available notify physician to schedule test. If age of results or change in patient condition suggests possible new study needed, contact physician.
ICU/Non-ICU Unit RN:	• When getting report from ED nurse, verify completion of vaccination status, need for influenza and/or pneumococcal vaccination, smoking cessation counseling and complete at first opportunity. • Start discharge education including : activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen on admission. •Complete nursing or multi-disciplinary heart failure care plan. • Verify completion of education, immunizations & complete medications prior to completion of discharge.
Attending/primary Physician:	•Complete physical examination and evaluation •If heart failure suspected, implement heart failure pre-printed/electronic order set for selection of: - chest radiography, routine labs including BNP or NT-proBNP level, lipid profile per & ECG- 2010 Comprehensive heart Failure Practice Guidelines*. *Guidelines for selections are on the pre-printed/electronic evidenced-based order sets, in the Zynx tools www.zynx.com , on the, IHI and AHRQ web sites and the physician i-phone/droid software application.* *Evaluation of myocardial ischemia is recommended in those who develop new-onset LV systolic dysfunction. The choice of testing modality and timing should depend on the clinical suspicion and underlying risk factors.

*HFSA – Heart Failure Society of America; ACC American College of Cardiology

Acute Myocardial Infarction (AMI), as defined in the D2B project, is the core measure diagnosis where the process is measured in minutes and outcomes are measured by mortality. As a result of this, a focus of improvement initiatives related to AMI care is streamlining processes to shorten the time required to open an affected

artery or arteries during a heart attack. Particular attention must be paid to minimizing the steps involved in diagnosing a heart attack and getting patients reperfused as rapidly as possible. The next step is to assure that every patient receives the right medications throughout hospitalization and discharge. The last step is to ensure that the patient/caregiver understands and engages in appropriate follow up care, regardless of whether that is at home, in cardiac rehabilitation, long term care or something in between.

The American College of Cardiology (ACC) and the American Heart Association (AHA) have worked with clinicians to develop guidelines for care based on the evidence and to promote awareness of evidenced-based care in the community. The total number and type of care components a patient receives during the hospital course and post-discharge vary based on clinical condition and other co-morbidities. However, cardiologists and expert panels have reached broad consensus around a core set of care components that should be provided to all patients with an AMI, unless a clear contraindication exists and is documented in the medical record. The American College of Cardiology/American Heart Association Task Force on Performance Measures included the following components in their recommended guidelines and measures for AMI care:

- Aspirin within 24 hours of hospital arrival and at discharge
- Beta-blocker at discharge
- ACE-inhibitor or angiotensin receptor blockers (ARB) at discharge for patients with systolic dysfunction
- Timely initiation of reperfusion (thrombolysis within 30 min or percutaneous intervention within 90 min)
- Smoking cessation counseling

Outcome measure: AMI 30 day mortality rate.

*Ischemic symptoms, quality of care and mortality during myocardial infarction. Heart 2008;**94**:e2 doi:10.1136/hrt.2006.111674 electronic pages. EB Scheibert., J.S. Rumsfeld., H.M. Krumholz, F.A. Masoudi., K.J.Reid., J.A. Spercus.Dr. E.B. Scheibert. National Heart Lung, and Blood Institute. National Institute of Health. 10 Center Drive, Room B1D416, MSC 1061, Bethesda, MD 20892-1061, USA. Dr E B Schelbert, National Heart, Lung, and Blood Institute, National Institutes of Health, 10 Center Drive, Room B1D416, MSC 1061, Bethesda, MD 20892–1061, USA; schelberteb@nhlbi.nih.gov **Accepted** 8 May 2007 **Published Online First** 16 July 2007. The D2B Alliance@http://www.d2balliance.org The Importance of Consistent High Quality Acute Myocardial Infarction and Heart Failure Care. J Am Coll Cardiol, 2011; 58:637-644, doi:10.1016/j.jacc.2011.05.012* *© 2011 by the American College of Cardiology Foundation.*

Common Cardiac Medications			
Platelet Inhibitors: Salicylates Aspirin **Angiotensin Converting Enzyme Inhibitors (ACE-I)** Captopril Enalopril Fosinopril Lisinopril Perindopril Quinapril Ramapril Trandolapril **Angiotensin Receptor Blockers (ARB)** Candesartan Losartan Valsartan	**Anticoagulants:** Bivalirudin Fondaparinux Low-Molecular Weight Heparins Dalteparin or Enoxaprin Unfractionated Heparin Warfarin – Coumadin **Beta Blockers** Carvedilol Metoprolol tartrate **Calcium Chanel Blockers** Diltizem Verapamil **Cardiac Glycosides** Digoxin	**Diuretics** Bumetidine Furosemide Torsemide **Lipid-Regulating Agents:** Bile Acid Sequestrants Cholestyramine Colesevelam Colestipol Cholesterol Absorption Inhibitors Ezetimibe Combination Agents Vytorin Fibric Acid Derivatives Fenobirate Fenobirate Micronized Fenofibrate nanocrystallized Fenofbric Acid Gemfibrozil	**Lipid-Regulating Agents (con't):** HMG-CoA Reductase Inhibitors Atorvastatin Fluvastatin Lovastatin Pitavastatin Pravastatin Rosuvastatin Nicotinic Acid Derivatives Niacin Omega-3 Fatty Acid Esters **Platelet Inhibitors: Thienopyridines** Clopidigrel Prasugrel **Potassium supplements** Potassium chloride
https://www.zynx.com			

So What is Your Role in AMI?

ROLE OWNER	DESCRIPTION
EMS*	•*Complete pre-hospital 12-lead ECG with activation of cath-lab prior to arrival – goal time- 30 min or less ECG to hospital door* •Participate in routine process review and 100% review of cases not meeting timliness

Triage Nurse:	•Complete 30-60 second chest pain assessment for ACS symptoms. •Implement chest pain Triage protocol/guidelines if symptoms present including completion of ECG <5 min. •Notify ED physician if LBB or ST segment changes • goal time – ≤30 min ED door to Cath lab goal (Door to Balloon <90 min. best practice ≤60 min*)
ED Physician:	•Complete physical assessment and evaluation •Implement pre-printed/electronic order set** : - labs troponin-I, troponin-T, LDL-C on admit or w/in 24 hrs, Creatinine, Hg, HCT. CK-MB by mass assay if troponin not avail.; 12-lead ECG if not completed in field by EMS; etc. routine labs including troponin level, lipid profile & ECG-ACC AHA* *Pre-printed/electronic orders and guidelines are availablein the zynx tools www.zynx.com , on the IHI site at www.ihi.org , the AHRQ and the American College of Cardiology http://www.d2balliance.org/web sites, and the physician i-phone/droid software application.* •Activate the cath lab – one call process to activate without waiting for cardiologist review is best practice •Participate in routine process review and 100% review of cases not meeting timliness
Cath Lab Team	•Arrive and Cath lab team be ready in 30 min – *best practice 20 minutes •Participate in routine process review and 100% review of cases not meeting timliness
ED Staff:	•Complete expeditious prep of patient, including limited assess with pre-printed standardized orders for IV access, groin prep, Reopro etc.** •Transport to cath lab when 2 of 3 present with "ready call". •Transport hospital to hospital transfers directly to cath lab when 2 of 3 present with "ready call". •Participate in routine process review and 100% review of cases not meeting timliness
Cardiologist:	•Complete brief assess in ED or cath lab if missed in ED •Initiate reperfusion with goal time <30 min w/thrombolysis or <90 min w/PCI - best practice is <60 min. •Complete routine process review and 100% review of cases not meeting timliness
Pharmacist	• Review all medication orders for completeness and appropriateness prior to administration of the first dose. -orders should include: ACE/ARB, Beta Blocker for those with LVEF < 40%; anticoagulant for those with A-fib, Lipid regulating agent; •Contact physician if not appropriate or a contraindication is noted. •Complete pharmacy review of discharge medication orders to assure appropriateness and completeness of discharge medications – contact physician to resolve discrepancies if any noted.
Proactive Chart Manager – Case Manager begin on admission	• Check for complete vaccination status or documentation of contraindications, smoking cessation and other education needs and status. • Check discharge planning for complete education, medications and post discharge follow up care /transition of care to cardiac rehab or other ambulatory plan, including follow up appointments. • Notify physician if orders are missing or not complete for documentation of contraindications.
ICU/Non-ICU Unit RN:	•Complete assessment and start AMI nursing or multidisciplinary plan. •Verify vaccination status/need for influenza and/or pneumococcal vaccination and complete at first opportunity. •Begin discharge education including : smoking cessation counseling needs, activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen. • Verify completion of education, immunization & complete D/C medications s prior to completion of discharge.
Attending/primary Physician:	•Complete physical examination & evaluation •Implement AMI pre-printed/electronic order sets for selection of: - routine labs including lipid profile per –ACC/AHA guidelines* *Guidelines for selections are on the pre-printed/electronic evidenced-based order sets, in the Zynx tools www.zynx.com , on the, IHI and AHRQ web sites and the physician i-phone/droid software application.*

*Bradley EH, Roumanis SA, et al. Achieving door-to-balloon times that meet quality guidelines: how do successful hospitals do it? *J Am Coll Cardiol.* 2005 Oct 4;46(7):1236-1241. Bradley EH, Curry LA, et al. Achieving rapid door-to-balloon times: how top hospitals improve complex clinical systems. *Circulation*. 2006 Feb 28;113(8):1079-1085. Epub 2006 Feb 20. Bradley EH, Herrin J, et al. Strategies for reducing the door-to-balloon time in acute myocardial infarction. *N Engl J Med*. 2006 Nov 30;355(22):2308-2320. The American College of Cardiology http://www.d2balliance.org/