UNM HOSPITALS

Core Measures:
What are the goals and what are our roles?

Heart Failure (HF) and
Acute Myocardial Infarction (AMI)
Core Measures

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Disclosures

- None

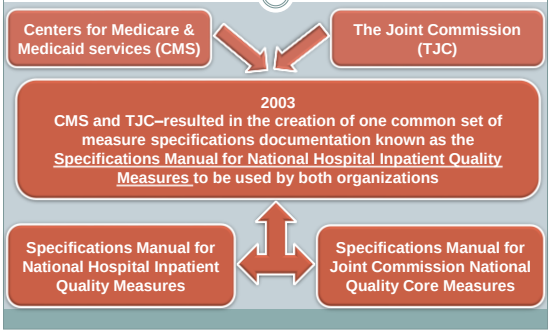
Objectives

- Pharmacists
  - List the 3 TJC core measures for Heart Failure and describe how pharmacy can provide assistance to meet them.
- Technicians
  - Describe the importance of meeting core measures for heart failure patients.

Self-assessment Questions

1. True or False
   - Heart failure patients need to have documentation in the hospital record that LVSF was evaluated before arrival, during hospitalization, or is planned for after discharge to meet core measures for CMS and TJC.
2. True or False
   - In 2015 CMS and TJC will continue to have the same reported measures for HF and AMI
3. True or False
   - Left Ventricular Systolic Dysfunction is defined as LVSF <40%
4. True or False
   - Reviewing discharge paperwork and prescriptions is one way pharmacy can aid in optimizing core measures for HF and AMI

Core Measures



Core Measures for Heart Failure

Measure		CMS	TJC
HF-1	Discharge instruction	Retired Jan 1, 2014	Retired Jan 1, 2014
HF-2	Evaluation of Left Ventricular Systolic Function (LVSF)	Keeping	Keeping
HF-3	ACEi or ARB for Left Ventricular Systolic Dysfunction (LVSD)	Retired Jan 1, 2015 Voluntary for 2014	Keeping

http://www.jointcommission.org/core_measure_sets.aspx

Heart Failure Core Measures

HF-1: Discharge instruction

- Documentation that patients were discharged home w/ written instructions or educational material addressing ALL of the following: activity level, diet, discharge medications, follow-up appointment, weight monitoring, and what to do if symptoms worsen

HF-2: Evaluation of Left Ventricular Systolic Function (LVSF)

- Documentation in the hospital record that LVSF was evaluated before arrival, during hospitalization, or is planned for after discharge

HF-3: ACEi or ARB for Left Ventricular Systolic Dysfunction (LVSD)

- Patients w/LVSD (LVEF <40%) are prescribed an ACEi or ARB at hospital discharge

Pharmacy's Role

- **Identify HF patients on admission to the hospital**
- **Create order sets with updated guideline driven info and embed in workflow**
- **Review Depart Process and Medication Reconciliation on Discharge**

Acute Myocardial Infarction (AMI) Core Measures

Measure		CMS	TJC
AMI-1	Aspirin at Arrival	Voluntary	Keeping
AMI-2	Aspirin Prescribed at Discharge	Retired Jan 1, 2015	Keeping
AMI-3	ACEi or ARB for LVSD	Voluntary	Keeping
AMI-5	Beta- Blocker Prescribed at Discharge	Voluntary	Keeping
AMI-7	Median Time to Fibrinolysis	Voluntary	Keeping
AMI-7a	Fibrinolytic Therapy Received Within 30min of Hospital Arrival	Keeping **REQUIRED**	Keeping
AMI-8	Median Time to Primary PCI	Voluntary	Keeping
AMI-8a	Primary PCI Received Within 90 minutes of Hospital Arrival	Keeping **REQUIRED**	Keeping
AMI-10	Statin Prescribed at Discharge	Retired Jan 1, 2015	Keeping

http://www.jointcommission.org/core_measure_sets.aspx

Pharmacy's Role

- **Identify AMI patients on admission to the hospital**
- **Create order sets with updated guideline driven info and embed in workflow**
- **Review Depart Process and Medication Reconciliation on Discharge**

Self-assessment Questions

1. True or False
   - Heart failure patients need to have a documentation in the hospital record that LVSF was evaluated before arrival, during hospitalization, or is planned for after discharge to meet core measures for CMS and TJC.
2. True or False
   - In 2015 CMS and TJC will continue to have the same required reported measures for HF and AMI.
3. True or False
   - Left Ventricular Systolic Dysfunction is defined as LVSF <40%.
4. True or False
   - Reviewing discharge paperwork and prescriptions is one way pharmacy can aid in optimizing core measures for HF and AMI.

UNM HOSPITALS

Core Measures:
What are the goals and what are our roles?

Venous Thromboembolism (VTE) Core Measures

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Inpatient Anticoagulation Services
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Anticoagulation FORUM | ANTICOAGULATION Centers of Excellence

Disclosures

- Anticoagulation Forum National Board (non-profit)

Objectives

- Pharmacists
  - Describe the 6 core measures pertaining to venous thromboembolism (VTE)
- Technicians
  - List 6 anticoagulants that may be used to prevent or treat VTE

Self-assessment Questions

1. True or false
   - The VTE core measures include both prophylaxis and treatment populations
2. True or false
   - It is possible to achieve core measures without providing optimal, evidence-based care
3. True or false
   - VTE-5, discharge instructions, pertains to all anticoagulants
4. True or false
   - There are numerous ways pharmacists can aid in optimizing management of VTE prophylaxis and treatment

VTE Core Measures

- **VTE-1: VTE prophylaxis**
- **VTE-2: VTE prophylaxis in ICU patients**
- **VTE-3: Anticoagulant overlap therapy**
- **VTE-4: Heparin per protocol & platelet monitoring**
- **VTE-5: VTE discharge instructions**
- **VTE-6: Incidence of potentially preventable VTE**

http://www.jointcommission.org/specifications_manual_for_national_hospital_inpatient_quality_measures.aspx

VTE-1 and VTE-2: Prophylaxis

ICU and non-ICU populations

- Patients who receive allowable VTE prophylaxis modality *the day of or the day after hospital admission* OR *transfer to ICU* OR
- have documented reason no prophylaxis was given

Process measure- improvement is measured as increase in the rate of prophylaxis

- Note measuring a hard, clinical outcome (e.g. rate of thrombosis)

Goal: 100% of eligible patients

VTE 1 & 2: Excluded Populations

- **<18 years**
- **Length of stay (LOS) <2 or >120 days**
- **Comfort measures only (CMO)**
- **Clinical trial**
- **ICD code for:**
  - Mental illness (not usually prophylaxed)
  - Obstetrics (not usually prophylaxed)
  - Stroke (included in stroke core measures)
  - VTE (included in VTE core measures 3-6)
- **Surgical (SCIP) patients**

"Allowable" Prophylaxis Modalities

- **Low-dose unfractionated heparin (UFH)**
- **Low molecular weight heparin (LMWH)- e.g. enoxaparin**
- **Factor XA inhibitors**
  - Fondaparinux (Arixtra®)
  - Rivaroxaban (Xarelto®)
  - Apixaban (Eliquis®)
- **Warfarin (Coumadin®)**
- **Intermittent pneumatic compression devices (IPC)**
- **Graduated compression stockings (GCS)**
- **Venous foot pumps (VFP)**

VTE 1 & 2: Challenges and Pitfalls

- Caution!
  - VTE prophylaxis measures may lead to "benchmarking mediocrity"
  - Does not require ongoing assessment throughout admission
    - e.g.- patient receives prophylaxis on days 1 and 2, but it is stopped for a procedure and never resumed for remaining 5 days of admission (would achieve core measure)
  - Suboptimal prophylaxis regimens may still achieve core measure
    - e.g.- a morbidly obese patient with cancer admitted for sepsis is only ordered for IPCs (would achieve core measure)
- "Appropriate" VTE prophylactic strategies must address
  - Type, dose and duration

Amin A, et al. J Thromb. Thrombolysis. 2010 Apr;29(3):326-39.

Pharmacy's Role

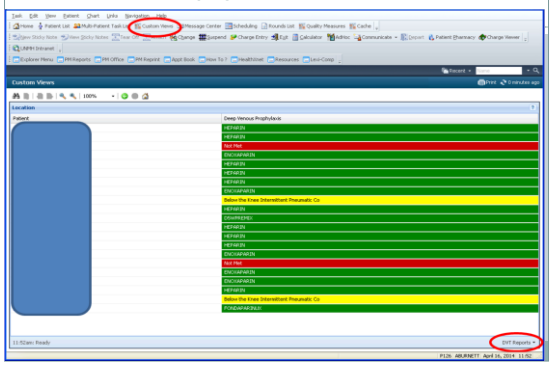
- **Ensure use of standardized VTE prophylaxis protocol**
- **Contains clinical decision support**
  - Makes it easy to do the right thing, hard to do the wrong thing
  - e.g. documenting reason no prophylaxis given
- **Include evidence-based prophylactic regimens**
  - Ensures ***appropriate dose*** of prophylaxis
- **Must employ some type of risk-assessment model (RAM)**
  - Identifies patients who do (and do not) warrant prophylaxis
  - Ensures ***appropriate type*** of prophylaxis (mechanical vs. pharmacologic)
- **Embed in order sets and workflow**

Pharmacy's Role

- Implementation of ongoing, real-time assessment and reassessment of VTE prophylaxis status
- Reports or dashboards with current information
- Clinical pharmacists, interns or technicians should monitor regularly
- Aids in ensuring ***appropriate duration*** of VTE prophylaxis

http://www.ahrq.gov/professionals/quality-patient-safety/patient-safety-resources/resources/vtguide/index.html

VTE Prophylaxis Dashboard



VTE-3: Overlap Therapy

Patients with confirmed VTE on warfarin and

- Receive overlap therapy with parental anticoagulant for ≥ 5 days and until INR ≥ 2 OR
- Have a documented reason overlap therapy was discontinued before 5 days OR
- Documentation of reason for no overlap therapy

Excludes

- <18 years
- LOS >120 days
- CMO
- Clinical trial
- Discharged to hospice or another hospital
- Expired
- Left against medical advice (AMA)
- Not receiving warfarin therapy (e.g. rivaroxaban, cancer patient)

VTE-3: Overlap therapy

Rationale

- Warfarin has a very slow onset of action
- Patients with acute VTE must receive rapid-acting parenteral anticoagulation until warfarin is therapeutic
- Discontinuing overlap therapy before 5 days and INR ≥ 2 places patient at increased risk of recurrent thrombosis

Process measure- improvement is measured as increase in the % of patients receiving "5+2"

Goal: 100% of eligible patients

(e.g. those without valid reason for early discontinuation or avoidance of overlap therapy

VTE-4: IV Heparin Per Protocol With Platelet Monitoring

Patients with confirmed VTE receiving IV UFH ***AND*** platelet (PLT) count monitored via nomogram or protocol

Excludes

- <18 years, LOS >120 days, CMO, clinical trial
- Discharged to hospice or another hospital, expired, left AMA
- Not receiving UFH therapy (e.g. LMWH)

VTE-4: IV Heparin Per Protocol With Platelet Monitoring

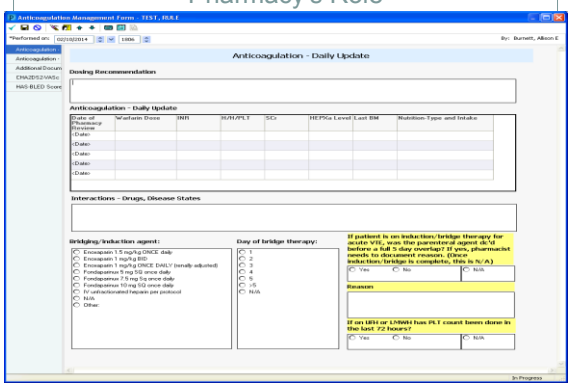
- Rational
  - Weight-based heparin nomograms/ protocols superior to standard dosing in achieving therapeutic anticoagulation within 24 hours, which reduces risk of recurrent thrombosis
  - Standardized UFH nomograms/protocols reduce the risk of adverse events, such as bleeding and thrombosis
  - Heparin-induced thrombocytopenia (HIT) occurs in up to 5% of patients treated with UFH, and thus PLT count monitoring is warranted
- *Process* measure- improvement is measured as increase in the % of patients receiving UFH and PLT monitoring via nomogram or protocol
- Goal: 100% of eligible patients

Raschke RA, Reilly BM, Guidry JR, Fontana JR, Srinivas S Ann Intern Med. 1993;119(9):874
Linkins LA, et al. CHEST 2012; *Chest 141(2 Suppl):e495S–530S.*

Pharmacy's Role

- Develop and implement UFH nomograms/ protocols
- Obtain approval from P&T committee for pharmacy to order any needed relevant labs
- Involve pharmacists in management of VTE patients
- Develop clinical tools that capture information pertinent to VTE core measures

Pharmacy's Role



VTE-5: Discharge Instructions

Documentation that patient/caregiver was given "copy of WRITTEN discharge instructions or educational materials to take home" that address all of the following:

- Compliance with warfarin and INR checks
- Dietary advice (consistency rather than avoiding vitamin K)
- Follow-up monitoring
- Potential adverse reactions and drug interactions

Process measure- improvement is measured as increase in the % of patients with documentation of written discharge instructions for warfarin being provided

Goal: 100% of eligible patients

- Includes new and experienced patients

VTE-5: Discharge Instructions

Caution!

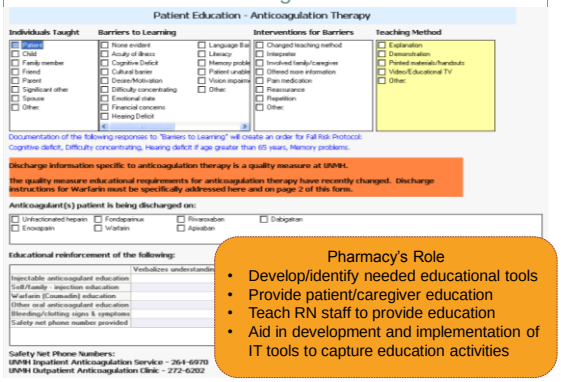
May lead to "benchmarking mediocrity

Only pertains to warfarin

Should strive to include all anticoagulants

- Newer, less familiar target-specific oral anticoagulants
- Enoxaparin monotherapy in patients with acute VTE & malignancy

VTE-5: Discharge Instructions



Pharmacy's Role

- Develop/identify needed educational tools
- Provide patient/caregiver education
- Teach RN staff to provide education
- Aid in development and implementation of IT tools to capture education activities

VTE-6: Potentially Preventable VTE

- Patients diagnosed with an acute VTE that did not receive appropriate VTE prophylaxis between admission and time to VTE diagnosis
  - VTE present on admission (POA) excluded
  - Patients with contraindication to VTE prophylaxis excluded
- Outcome measure
  - Clinical outcome of acute VTE
- Goal: 0%
- Requires more in-depth chart review and abstraction
  - Pharmacy may not have a big role in VTE-6
  - Consider multidisciplinary discussion to determine what "went wrong" and ways to prevent recurrence
  - Real-time analysis preferable, but may not be feasible

Self-assessment Questions

1. True or false
   - The VTE core measures include both prophylaxis and treatment populations
2. True or false
   - It is possible to achieve core measures without providing optimal, evidence-based care
3. True or false
   - VTE-5, discharge instructions, pertains to all anticoagulants
4. True or false
   - There are numerous ways pharmacists can aid in optimizing management of VTE prophylaxis and treatment

Surgical Care Improvement Project (SCIP) – What Are the Goals and What Are Our Roles?

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Disclosures

- None to Report

Objectives

- Pharmacists
  - Describe the 8 national inpatient quality measures pertaining to SCIP
- Technicians
  - List the inpatient quality reporting measures pertaining to SCIP that are time bound.

What Is SCIP?

National
SURGICAL INFECTION PREVENTION
Medicare Quality Improvement Project
SCIP Surgical Care Improvement Project
A National Quality Partnership

Short History of SCIP

SCIP Steering Committee

- American College of Surgeons
- American Hospital Association
- American Society of Anesthesiologists
- Association of peri-Operative Registered Nurses
- Agency for Healthcare Research and Quality
- Centers for Medicare & Medicaid Services
- Centers for Disease Control and Prevention
- Department of Veteran's Affairs
- Institute for Healthcare Improvement
- Joint Commission on Accreditation of Healthcare Organizations

Surgical Site Infection (SSI): Impact

- **Morbidity**
  - Most common type of Healthcare Associated Infection (HAI) (~22% of all infections)
  - An estimated 66,100 SSI's per year are attributed to SCIP procedures
  - According to the CDC, an estimated 53,700 SSI's were associated with 10 SCIP procedures
  - 2%-5% of patients undergoing inpatient surgery develop a SSI
  - Each SSI is associated with an increased LOS of approximately 7-10 days

SSI: Impact

- **Mortality**
  - 3% mortality
  - 2-11 times higher risk of death compared with patients without an SSI
  - 77% of deaths among patients with SSI are directly attributable to SSI
  - Over 8% of the HAI's resulting in death in the US were associated with SSIs.
- **Costs**
  - Estimated cost per infection ranges from $11,000 - $35,000
  - Estimated total cost in the United States ranges from $3 billion - $10 billion annually

An **estimated <u>40-60%</u>** of these infections are **preventable**

SCIP Core Measures

SCIP-Inf-1	Prophylactic Antibiotic Received within 1 Hour (2 hours if receiving Vancomycin or Fluoroquinolone) Prior to Surgical Incision
SCIP-Inf-2	Appropriate Prophylactic Antibiotic Selection for Surgical Patients
SCIP-Inf-3	Prophylactic Antibiotics Stopped within 24 Hours after Surgery End Time (48 hours for cardiac patients)
SCIP-Inf-4	Cardiac Surgery Patients with Controlled Postoperative Blood Glucose (< 180mg/dl) in the time- frame of 18 to 24 Hours after Anesthesia End Time
SCIP-Inf-6	Appropriate Hair Removal (no razors)
SCIP-Inf-9	Urinary catheter removed Postop Day 1 or 2 with day of surgery being Day 0
SCIP-Card-2	Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker during the Perioperative Period
SCIP-VTE-2	Appropriate Venous Thromboembolism Prophylaxis given within 24 Hours Prior to *Anesthesia Start Time* to 24 Hours After *Anesthesia*

SCIP-Inf-10 → Surgery Patients with Perioperative Temperature Management has been REMOVED for FY15!

How does CMS Measure SCIP?

- The following applies to all SCIP measures:
  - Type of Measure: Process
  - Improvement is Noted As: An increase in rate (%) of compliance
  - Goal: 100% of eligible patients

We Can't Afford Even One Miss!!

We **CAN** achieve our goal of 100% compliance if we **ALL** work together to **make it happen**!

SCIP - INFECTION MODULE

SCIP-Inf-1	Prophylactic Antibiotic Received within 1 Hour (2 hours if receiving Vancomycin or Fluoroquinolone) Prior to Surgical Incision
SCIP-Inf-2	Appropriate Prophylactic Antibiotic Selection for Surgical Patients
SCIP-Inf-3	Prophylactic Antibiotics Stopped within 24 Hours after Surgery End Time (48 hours for cardiac patients)
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SCIP-Inf-6	Appropriate Hair Removal (no razors)
SCIP-Inf-9	Urinary catheter removed on Post-Op Day 1 or 2 with day of surgery being Day 0

Prophylactic Antibiotics – QUESTIONS?

- **Which cases benefit/are included?**
- When should you start?
- Which drug should you use?
- How much should you give?
- How long should antibiotics be continued?

Summary of Surgical Procedures Included in the INPATIENT SCIP Inf Measures

Surgical Procedures	Approved Antibiotics
Coronary Artery Bypass Graft or Other Cardiac Surgery or Vascular Surgery	Cefazolin or Vancomycin[1] **If β-lactam allergy:** Vancomycin[2] or Clindamycin[2]
Hip Arthroplasty or Knee Arthroplasty	Cefazolin or Vancomycin[1] **If β-lactam allergy:** Vancomycin[2] or Clindamycin[2]
Colon Surgery	Ampicillin/Sulbactam or Metronidazole + Cefazolin or Metronidazole + Ceftriaxone **If β-lactam allergy:** Clindamycin + Aminoglycoside or Clindamycin + Quinolone or Metronidazole + Aminoglycoside or Metronidazole + Quinolone
Abdominal Hysterectomy or Vaginal Hysterectomy	Cefazolin or Cefuroxime or Ampicillin/Sulbactam **If β-lactam allergy:** Clindamycin + Aminoglycoside or Clindamycin + Quinolone or Metronidazole + Aminoglycoside or Metronidazole + Quinolone or Vancomycin + Aminoglycoside or Vancomycin + Quinolone
Principal Procedure Code of Abdominal Hysterectomy with an Other Procedure Code of Colon Surgery or Vaginal Hysterectomy with an Other Procedure Code of Colon Surgery	Cefazolin or Cefuroxime or Ampicillin/Sulbactam **If β-lactam allergy:** Clindamycin + Aminoglycoside or Clindamycin + Quinolone or Metronidazole + Aminoglycoside or Metronidazole + Quinolone or Vancomycin + Aminoglycoside or Vancomycin + Quinolone

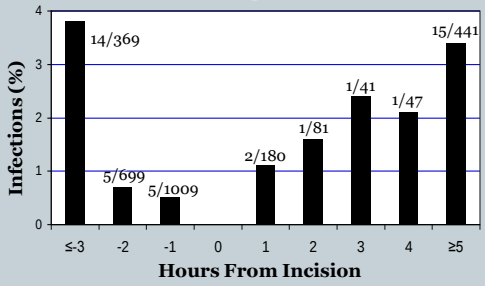
SCIP-Inf-1 & 2 → Exclusions

- **< 18 years of age**
- **LOS >120 days**
- **Principal diagnosis suggestive of preoperative infection**
- **Had a hysterectomy AND a cesarean section**
- **Had other procedures requiring general or spinal anesthesia**
  - **occurring within 3 days (4 days for cardiac surgery) prior to or after the procedure during a separate surgical episode but during the same hospital stay**
- **Documented PRE-op infection**
- **Enrolled in a clinical trial**

Prophylactic Antibiotics – QUESTIONS?

- Which cases benefit/are included?
- **When should you start?**
- Which drug should you use?
- How much should you give?
- How long should antibiotics be continued?

Prophylactic Antibiotics – TIMING



Classen. NEJM. 1992;328:281.

Prophylactic Antibiotics – TIMING

SCIP-Inf-1

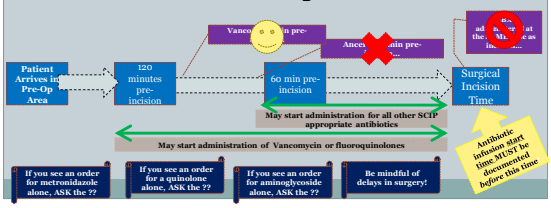
- Prophylactic antibiotic must be received within one hour prior to surgical incision.
- **This is measured by checking the earliest documented start time for the ordered antibiotic and comparing it to the surgical incision date and time for the procedure. To meet the measure the time cannot exceed 60 minutes.**

Prophylactic Antibiotics – TIMING

- **There are two exception to this rule:**
  - Vancomycin and Fluoroquinolones may be started *2 hours* prior to incision due to longer infusion times.
  - The approved prep for colon surgery includes some oral antibiotics which are taken the evening before surgery.

Prophylactic Antibiotics – TIMING

Antibiotics are given for the purpose of preventing infection when infection is ***not*** present but the risk of post-operative infection ***is*** present



Prophylactic Antibiotics – QUESTIONS?

- Which cases benefit/are included?
- When should you start?
- **Which drug should you use?**
- How much should you give?
- How long should antibiotics be continued?

Summary of Antimicrobial Recommendations Based on Type of Surgery for INPATIENT Procedures

Surgical Procedures	Approved Antibiotics
Coronary Artery Bypass Graft or Other Cardiac Surgery or Vascular Surgery	Cefazolin or Vancomycin[1] **If β-lactam allergy:** Vancomycin[2] or Clindamycin[2]
Hip Arthroplasty or Knee Arthroplasty	Cefazolin or Vancomycin[1] **If β-lactam allergy:** Vancomycin[2] or Clindamycin[2]
Colon Surgery	Ampicillin/Sulbactam or Metronidazole + Cefazolin or Metronidazole + Ceftriaxone **If β-lactam allergy:** Clindamycin + Aminoglycoside or Clindamycin + Quinolone or Metronidazole + Aminoglycoside or Metronidazole + Quinolone
Abdominal Hysterectomy or Vaginal Hysterectomy	Cefazolin or Cefuroxime or Ampicillin/Sulbactam **If β-lactam allergy:** Clindamycin + Aminoglycoside or Clindamycin + Quinolone or Metronidazole + Aminoglycoside or Metronidazole + Quinolone or Vancomycin + Aminoglycoside or Vancomycin + Quinolone
Principal Procedure Code of Abdominal Hysterectomy with an Other Procedure Code of Colon Surgery or Vaginal Hysterectomy with an Other Procedure Code of Colon Surgery	Cefazolin or Cefuroxime or Ampicillin/Sulbactam **If β-lactam allergy:** Clindamycin + Aminoglycoside or Clindamycin + Quinolone or Metronidazole + Aminoglycoside or Metronidazole + Quinolone or Vancomycin + Aminoglycoside or Vancomycin + Quinolone

Guidelines vs. SCIP Core Measures

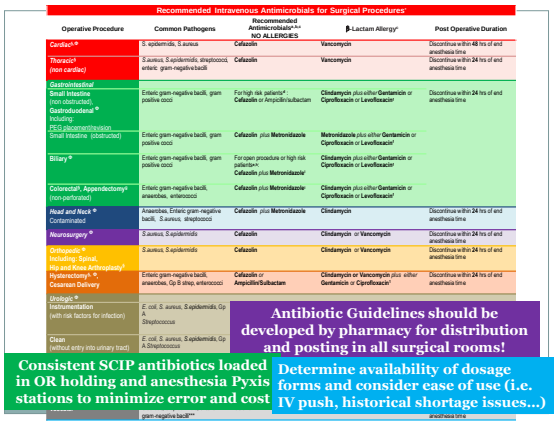
Guidelines	SCIP Measures
Comprehensive for **all surgery types**	Measures for **specific surgery types**
Provides antimicrobial **recommendations** for all surgery types	Provides antimicrobial **choices** for each reportable surgery type
Recommends all prophylactic antimicrobials be given 60 minutes prior to incision (120 for fluoroquinolones and vancomycin)	**Requires** all prophylactic antimicrobials be given 60 minutes prior to incision (120 for fluoroquinolones and vancomycin)
Includes dosing recommendations	**No dosing** information listed
Includes recommended **redosing** intervals	**No redosing** information listed
Advocates discontinuation of all prophylactic antimicrobials within 24 hrs	**Requires** discontinuation of all prophylactic antimicrobials within 24 hours (48 for cardiac)
Includes pediatric recommendations	**No pediatric** surgical data provided

Am J Health-Syst Pharm 2013;70:195-283
Am J Health-Syst Pharm 1999;56:1839-88

1999 versus 2013 ASHP Guidelines

	1999 (48 pages)	2013 (89 pages)
Preoperative-dose timing	"At induction of anesthesia"	Within 60 minutes before surgical incision (vancomycin and fluoroquinolones 120 minutes)
Updates on recommended doses	Recommends lower doses: Cefazolin 1 gm Vancomycin 1 gm Clindamycin 600 mg Gentamicin 1.7 mg/kg	Recommends higher doses: Cefazolin 2 gm Vancomycin 15 mg/kg Clindamycin 900 mg Gentamicin 5 mg/kg
Morbidly obese	No comments	Cefazolin 3 gm for patients weighing > 120 kg
Redosing Interval Defined	No redosing intervals listed	Redosing intervals listed Intraoperative redosing for procedures lasting longer than 2 half lives of antibiotic
Duration of prophylaxis	Evidence discussed in text, however no definitive recommendations	Single dose or continuation for < 24 hours for most procedures

Am J Health-Syst Pharm 2013;70:195-283
Am J Health-Syst Pharm 1999;56:1839-88



Vancomycin Documentation Criteria

If Vancomycin is ordered, one of the following MUST be documented pre-operatively by physician/APN/PA or *pharmacist*:
Beta-lactam allergy (PCN or cephalosporin)
MRSA, Colonization or infection
Patient with an acute inpatient hospitalization within the last year
Patient residing in a nursing home within the last year
Patient with chronic wound care or dialysis
Patient with continuous inpatient stay more than 24 hours prior to the principal procedure
Patient transferred from another inpatient hospitalization after a 3 day stay
Patient undergoing valve surgery

Prophylactic Antibiotics – QUESTIONS?

- Which cases benefit/are included?
- When should you start?
- Which drug should you use?
- **How much should you give?**
- How long should antibiotics be continued?

Recommended Doses and Redosing Intervals for Commonly Used Antimicrobials for Surgical Prophylaxis

Antimicrobial	Recommended Dose: Adult[a]	Recommended Dose: Pediatrics[b]	Half-Life in Adults with Normal Renal Function, hr	Recommended Redosing Interval (from initiation of preoperative dose), hr[c]	Infusion Duration[b] (minutes)
Ampicillin/ sulbactam	3 g (ampicillin 2 g/ sulbactam 1 g)	50 mg/kg of the ampicillin component	0.8-1.3	2	15
Ampicillin	2 g	50 mg/kg	1-1.9	2	15-30
Aztreonam[d]	2 g	30 mg/kg	1.3-2.4	4	30
Cefazolin	2 g[e]	30 mg/kg	1.2-2.2	4	10-60
Cefuroxime	1.5 g	50 mg/kg	1-2	4	15-30
Ceftriaxone	2 g[e]	50-75 mg/kg	5.4-10.9	NA	30
Ciprofloxacin	400 mg	10 mg/kg	3-7	NA	60
Clindamycin	900 mg	10 mg/kg	2-4	6	10-60
Fluconazole	400 mg	6 mg/kg	30	NA	60-120
Gentamicin[g]	5 mg/kg based on dosing weight (single dose)	2.5 mg/kg based on dosing weight	2-3	NA	30-60
Levofloxacin[f]	500 mg	10 mg/kg	6-8	NA	60-90
Metronidazole	500 mg	15 mg/kg (Neonates weighing <1200g receive a single 7.5-mg/kg dose)	6-8	NA	30-60
Moxifloxacin[g]	400 mg	10 mg/kg			60
Piperacillin-tazobactam	3.375 g	Infants 2-9 mo: 80 mg/kg of piperacillin component Children >9 mo and ≤40 kg: 100 mg/kg of piperacillin component	0		30
Vancomycin	15 mg/kg	15 mg/kg	4-8	NA	60-90
Oral antibiotics for colorectal surgery prophylaxis (used in conjunction with a mechanical bowel preparation)					
Erythromycin base	1 g	20 mg/kg	0.8-3	NA	NA
Metronidazole	1 g	15 mg/kg	6-10	NA	NA
Neomycin	1 g	15 mg/kg	2-3	NA	NA

All Pre and Post-Op Order-sets should be reviewed by Pharmacy for accuracy of dosing

Prophylactic Antibiotics – **Re-dosing**

- Research shows that the success of the prophylactic antibiotics lies with maintaining a drug blood level during surgery
- If the procedure is long (over 4 hours) a second dose may need to be given…

Recommended Doses and Redosing Intervals for Commonly Used Antimicrobials for Surgical Prophylaxis

Antimicrobial	Recommended Dose		Half-Life in Adults with Normal Renal Function, hr	Recommended Redosing Interval (from initiation of preoperative dose), hr[c]	Infusion Duration[b] (minutes)
	Adult[a]	Pediatrics[b]			
Ampicillin/ sulbactam	3 g (ampicillin 2 g/ sulbactam 1 g)	50 mg/kg of the ampicillin component	0.8-1.3	2	15
Ampicillin	2 g	50 mg/kg	1-1.9	2	15-30
Aztreonam[e]	2 g	30 mg/kg	1.3-2.4	4	30
Cefazolin	2 g*	30 mg/kg	1.2-2.2	4	10-60
Cefuroxime	1.5 g	50 mg/kg	1-2	4	15-30
Ceftriaxone	2 g*	50-75 mg/kg	5.4-10.9	NA	30
Ciprofloxacin	400 mg	10 mg/kg	3-7	NA	60
Clindamycin	900 mg	10 mg/kg	2-4	6	10-60
Fluconazole	400 mg	6 mg/kg	30	NA	60-120
Gentamicin[e]	5 mg/kg based on dosing weight (single dose)	2.5 mg/kg based on dosing weight	2-3	NA	30-60
Levofloxacin[f]	500 mg	10 mg/kg	6-8	NA	60-90
Metronidazole	500 mg	15 mg/kg (Neonates weighing <1200g receive a single 7.5-mg/kg dose)	6-8	NA	30-60
Moxifloxacin[g]	400 mg	10 mg/kg	8-15	NA	60
Piperacillin-tazobactam	3.375 g	Infants 2-9 mo: 80 mg/kg of piperacillin component Children >9 mo and ≤40 kg: 100 mg/kg of piperacillin component	0.7-1.2	2	30
Vancomycin	15 mg/kg	15 mg/kg	4-8	NA	60-90
Oral antibiotics for colorectal surgery prophylaxis (used in conjunction with a mechanical bowel preparation)					
Erythromycin base	1 g	20 mg/kg	0.8-3	NA	NA
Metronidazole	1 g	15 mg/kg	6-10	NA	NA
Neomycin	1 g	15 mg/kg	2-3	NA	NA

Prophylactic Antibiotics – **QUESTIONS?**

- Which cases benefit/are included?
- When should you start?
- Which drug should you use?
- How much should you give?
- **How long should antibiotics be continued?**

Prophylactic Antibiotics – **DURATION**

SCIP-Inf-3

- Prophylactic antibiotics must be discontinued within 24 hours after Anesthesia End Time.

Consider surgical sticker scanned to pharmacy for antimicrobial timing if not accessible electronically (i.e. anesthesia on a separate system than pharmacy…)

There is one exception to this indicator:

- Prophylactic antibiotics must be discontinued within ***48 hours*** after Anesthesia End Time *for cardiac surgery.*

Ensure all post-op order-sets are reviewed by pharmacy and have appropriate frequencies/stop times

Daily Review of SCIP Report:
•Antibiotic stop date/time
•Chart review for documentation justifying extended duration of antibiotic administration

Prophylactic Antibiotics – **DURATION**

"A goal of prophylaxis with antibiotics is to provide benefit to the patient with as little risk as possible. It is important to maintain therapeutic serum and tissue levels throughout the operation. Intraoperative re-dosing may be needed for long operations. However, ***administration of antibiotics for more than a few hours after the incision is closed offers no additional benefit to the Surgical patient.*** *Prolonged administration does increase the risk of Clostridium difficile infection and the development of antimicrobial resistant pathogen*

Educate Providers on Importance

Consider requiring all antimicrobials to have an indication listed prior to being profiled…

Papers Comparing Duration of Peri-Op Antibiotic Prophylaxis (≤ 24 hours vs. > 24 hours)

Colorectal	3
Mixed GI	4
Hysterectomy	3
Gyn & GI	1
Head & Neck	3
Orthopedic	4
Vascular	3
Cardiac	7
Total	**28**

- Most studies have confirmed efficacy of ≤ 12 hours
- Many studies have shown efficacy of a single dose
- Whenever compared, the shorter course has been as effective as the longer course

Papers supporting longer duration: 1

Consequences of Prolonged Antimicrobial Use

- Increased antibiotic and drug administration costs
- Increased antibiotic-associated complications
- Increased patterns of antibiotic resistance
- *Clostridium difficile* Enterocolitis
- Colonization with MRSA

➢ **Based on this, many guidelines recommend not continuing any prophylactic antibiotics post–op OR ordering just one dose to be given before the patient leaves PACU.**

Reasons To Extend Post-Op Antibiotics

- Postoperative infection
- Lower extremity original or revision arthroplasty with documentation of a current benign or malignant bone tumor of the same extremity
- Erythromycin for the purpose of increasing gastric motility
- Demeclocycline for the treatment of SIADH or hyponatremia
- An antibiotic was administered postoperatively for the:
  - treatment of hepatic encephalopathy
  - treatment of pulmonary fibrosis
  - treatment of acne or rosacea

The practitioner must document the very specif… reason for antibiotic extension→ either written … or dictated after the incision bu… days for cardiac surgery) after anesthesia end time.

Symptoms alone don't count!

Pharmacist documentation is not accepted…

SCIP - VTE MODULE

➢ **SCIP-VTE-2:** Appropriate Venous Thromboembolism Prophylaxis given within 24 Hours Prior to *Anesthesia Start Time* to 24 Hours After *Anesthesia End Time*

- Mechanical and/or pharmacological prophylaxis is ordered according to VTE risk assessment and type of surgery, OR **document reason** for **NOT** administering BOTH mechanical and pharmacological prophylaxis.

Physician, PA, APN, or *pharmacist* documentation required if there is a reason for NOT administering or contraindicated : i.e. open wounds, bleeding risk…

Things to remember:

- Patients whose surgery time was ≤ 60 minutes are excluded
- Check for Preadmission Oral Anticoagulation and document findings!
- An allergy or ADR to one type of pharmacological prophylaxis is NOT sufficient as a reason for not administering all pharmacological prophylaxis.
- Patient refusal (refused both mechanical and pharmacologic) must be documented within 24 hrs after End of Anesthesia time, and may be documented by the RN.

SCIP - VTE MODULE

Intracranial Neurosurgery	Select from any of the following
❑ Low molecular weight heparin (LMWH)	
❑ Low-dose unfractionated heparin (LDUH)	
❑ Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS)	
❑ LDUH or LMWH combined with IPC or GCS	
Note: Current guidelines recommend postoperative low molecular weight heparin for Intracranial Neurosurgery	
General Surgery	**Select from any of the following**
❑ Low molecular weight heparin (LMWH)	
❑ Low-dose unfractionated heparin (LDUH)	
❑ Factor Xa Inhibitor (fondaparinux)	
❑ Intermittent pneumatic compression devices (IPC)	
Gynecologic Surgery	**Select from any of the following**
❑ Low molecular weight heparin (LMWH)	
❑ Low-dose unfractionated heparin (LDUH)	
❑ Factor Xa Inhibitor (fondaparinux)	
❑ Intermittent pneumatic compression devices (IPC)	
❑ LDUH or LMWH or Factor Xa Inhibitor combined with IPC or GCS	
Urologic Surgery	**Select from any of the following**
❑ Low molecular weight heparin (LMWH)	
❑ Low-dose unfractionated heparin (LDUH)	
❑ Factor Xa Inhibitor (fondaparinux)	
❑ Intermittent pneumatic compression devices (IPC)	
❑ LDUH or LMWH or Factor Xa Inhibitor combined with IPC or GCS	

SCIP - VTE MODULE

Elective Total Knee or Total Hip Replacement	Select from any of the following
❑ Low molecular weight heparin (LMWH)	
❑ Low-dose unfractionated heparin (LDUH)	
❑ Factor Xa Inhibitor (fondaparinux)	
❑ Oral Factor Xa Inhibitor (Rivaroxaban)	
❑ Aspirin	
❑ Warfarin	
❑ Intermittent pneumatic compression devices (IPC)	
❑ Venous foot pump (VFP)	
Note: The U.S. Food and Drug Administration has approved Xarelto (rivaroxaban) to reduce the risk of blood clots, deep vein thrombosis (DVT) and pulmonary embolism (PE) following knee or hip replacement surgery ONLY.	
Hip Fracture Surgery	**Select from any of the following**
❑ Low molecular weight heparin (LMWH)	
❑ Low-dose unfractionated heparin (LDUH)	
❑ Factor Xa Inhibitor (fondaparinux)	
❑ Aspirin	
❑ Warfarin	
❑ Intermittent ps…	

Daily Review of SCIP Report:
•VTEP start date/time
•VTEP dosing and appropriateness based on procedure
•Chart review for documentation justifying reasons NOT to administer

Reasons for NOT administering VTE Prophylaxis

- Examples of reasons for not administering **mechanical** prophylaxis:
  - Arterial insufficiency of lower extremities
  - Bilateral amputee
  - Bilateral lower extremity trauma
  - Patient refusal
  - Patients on continuous IV heparin within 24 hours before or after surgery
- Examples of reasons for not administering **pharmacological** prophylaxis:
  - Active bleeding (GIB, cerebral hemorrhage, retroperitoneal bleeding)
  - Bleeding risk
  - GI bleed
  - Hemorrhage
  - Patient refusal
  - Patients on continuous IV heparin within 24 hrs before or after surgery
  - Risk of bleeding
  - Thrombocytopenia

Note: Physician documentation of bleeding risk or active bleeding in reference to the normal risk of bleeding or to the normal bleeding associated with surgery, is not considered a contraindication to pharmacological VTE prophylaxis.

SCIP - CARDIOVASCULAR MODULE

SCIP-Card-2

- Patients on Beta-Blocker Therapy Prior to Arrival Who Received a Beta-Blocker during the Perioperative Period (Day prior to surgery through Post-Op Day 2 with day of surgery being Day 0)
  - Continue if patient on home beta blocker therapy
  - Must document date of last dose taken, if taken prior to arrival
- Beta blocker may be given 24 hrs. prior to surgery or day of procedure (up to 12 midnight)
  If held according to parameters, physician, PA, APN, or *pharmacist* reason must be documented
- Then Beta blocker should be continued through POD's 1 & 2
  If held according to parameters, physician, PA, APN, or *pharmacist* reason must be documented EACH day!

SCIP - CARDIOVASCULAR MODULE

- Perioperative myocardial ischemia has been identified as the #1 risk factor for mortality after non-cardiac surgery. This is attributed to the exaggerated sympathetic response leading to persistently elevated heart rate.

Has the potential to significantly reduce cardiac deaths for up to 2 years postoperatively!

- Reasons for NOT administering Beta-Blocker Perioperative:
  - **Bradycardia [HR < 50]**
    - The use of bradycardia as a reason must be substantiated with documentation that the heart rate was less than 50 bpm.
  - **Hypotension [systolic < 100 mm/Hg]**
    - The use of hypotension as a reason must be substantiated by documentation that the blood pressure was < 100 mm/Hg.
  - **Concurrent use of intravenous inotropic medications during the peri-op period**

→Preoperative documentation that the patient is NPO or due to NPO status alone is not acceptable

SCIP Documentation Requirements

Indicator	Documentation Requirements
Pre-op antibiotic administration within 1 hour of incision (2 hr window allowed for Vancomycin & FQN)	•MUST clearly document to reflect actual administration and 1. ABX Name; 2. Date of Admin; 3. Time of Admin; 4. Route of ABX. •Document suspected/diagnosed infections clearly. •Be mindful of delays in surgery
Antibiotic selection	•MUST clearly document to reflect actual administration and 1. ABX Name; 2. Date of Admin; 3. Time of Admin; 4. Route of ABX. •Document suspected/diagnosed infections clearly. •MDs must use appropriate prophylactic antibiotic •Document clarification of appropriate antibiotic selection for patients with beta- lactam allergy
Antibiotic discontinued w/in 24 hours of anesthesia end time	•MD/APN/PA order reflecting continuation of antibiotics must have documentation of allowable reason to extend •The date/time/route of antibiotic administration ***MUST*** clearly documented

SCIP Documentation Requirements

Indicator	Documentation Requirements
VTE ordered & given w/in 24 hours anesthesia end time	•Date/time/route of VTE administration *MUST* be clearly documented by Nursing in the appropriate data field
Beta Blocker given perioperatively, if on Beta Blocker prior to arrival	•2 categories: 1. Patients with a LOS postoperatively < 2 days: Looking for documentation of administration of BB the day prior to or the day of surgery 2. Patients with a LOS postoperative 2 or more days: Looking for documentation of administration of BB the day prior to or day of surgery AND POD 1 or POD 2 •A *Conditional Hold with parameters (re: HR or BP) counts as a reason IF there is documentation that the beta-blocker* was held due to the specified parameters. •A reason must be noted each day the BB is held or not administered. Note: If pt took BB prior to arrival, the date and time of the last dose must be documented, or specific documentation that the BB was taken the day of surgery, to determine if w/in 24hrs prior to incision.

Self-Assessment Questions

- The 24 hour clock for discontinuing prophylactic antibiotics starts with the _____ end time.
  A. Incision
  B. Anesthesia
  C. First dose administered
- Any antibiotic included in the surgical prophylaxis guidelines is acceptable to be used for surgical prophylaxis and meets the SCIP-Inf-2 Core Measure.
  A. True
  B. False
- Appropriate Venous Thromboembolism Prophylaxis may be given within:
  A. 48 Hours After *Anesthesia End Time*
  B. 24 Hours Prior to *Anesthesia Start Time* to 24 Hours After *Anesthesia End Time*
  C. 24 Hours Prior to *Surgical Incision* to 24 Hours After *Anesthesia End Time*
- Preoperative documentation that the patient is NPO or due to NPO status alone is an acceptable reasons for NOT administering perioperative Beta-Blocker.
  A. True
  B. False

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QUESTIONS?