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

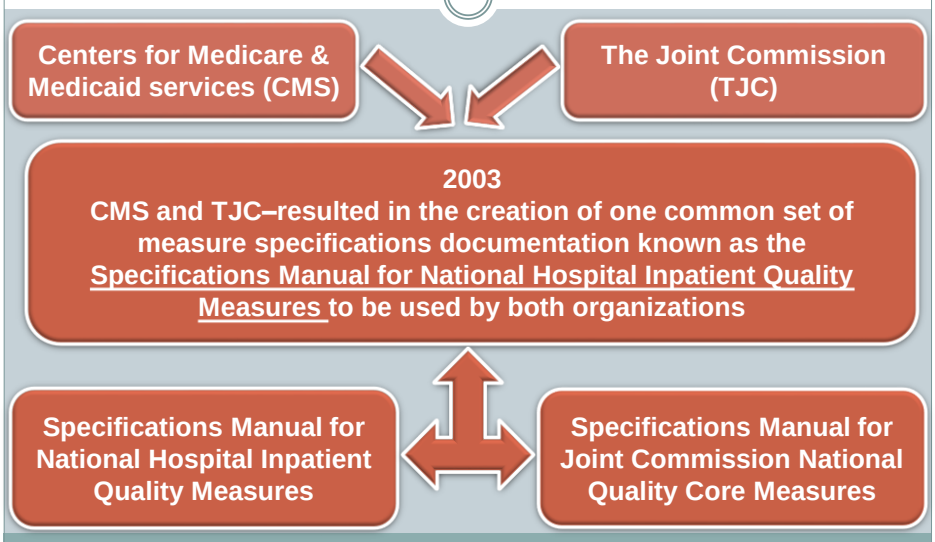
# Objectives

- 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<br>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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University of New Mexico Hospital

Anticoagulation FORUM | ANTICOAGULATION Centers of Excellence

# Disclosures

- Anticoagulation Forum National Board (non-profit)

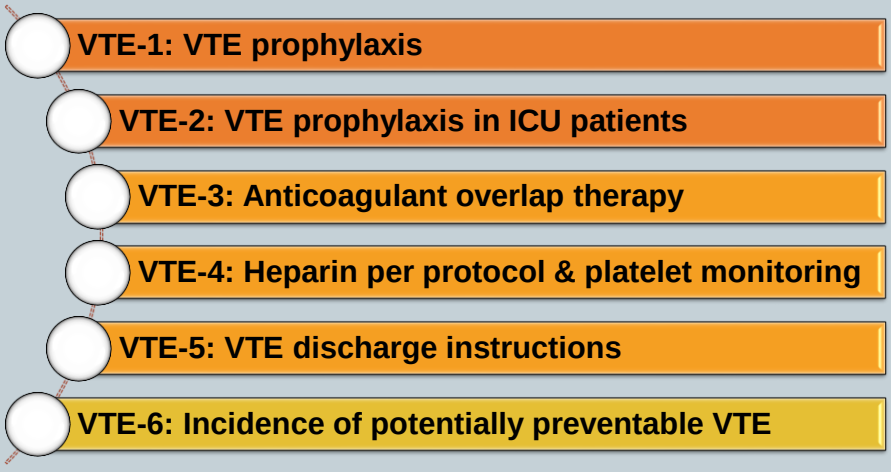
# Objectives

- 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




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

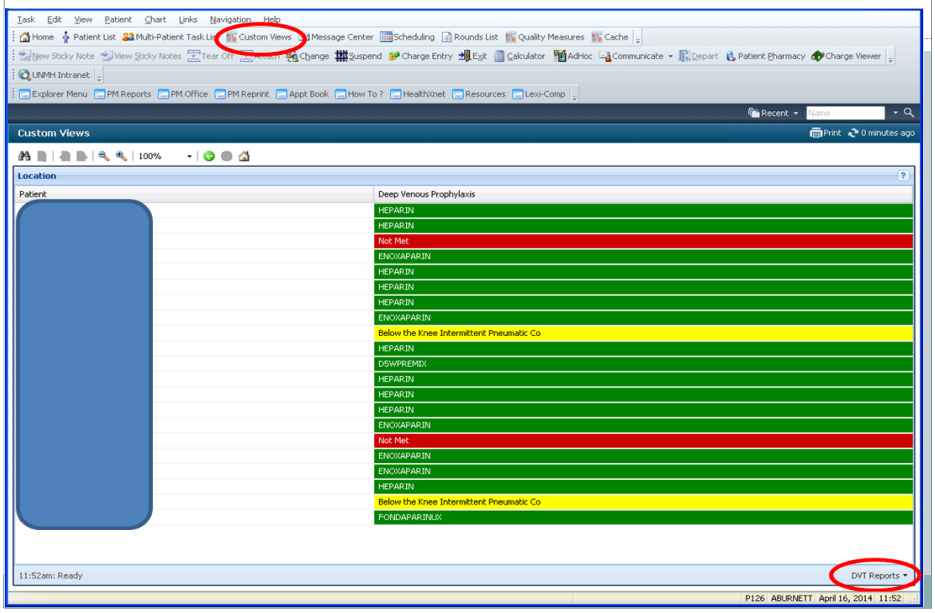
Reports or dashboards with current information

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

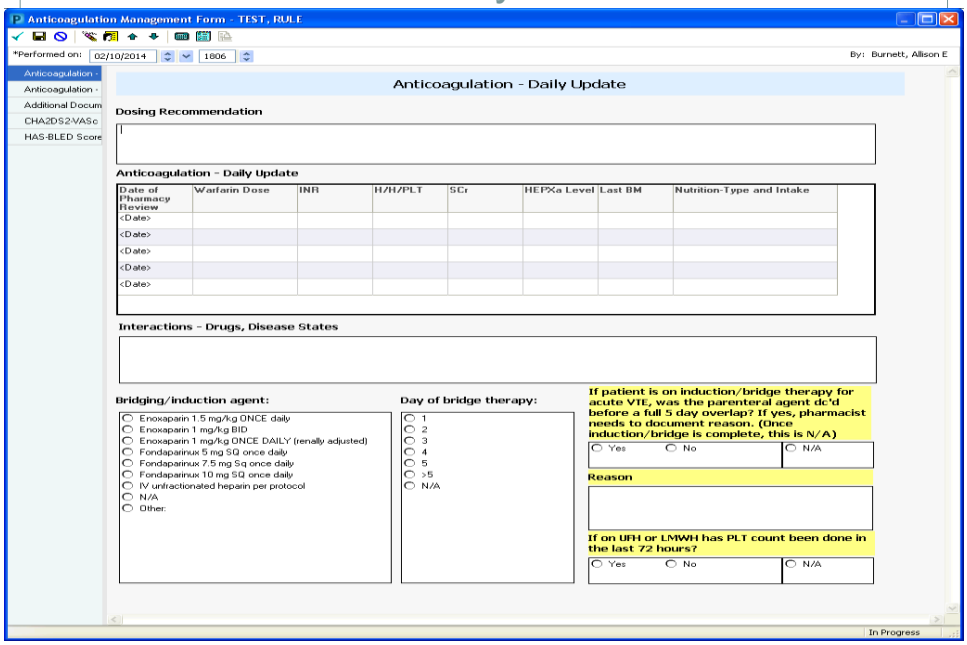
- Rational
  - Weight-based heparin nomograms/ protocols superior to standard dosing in achieving therapeutic anticoagulation within 24 hours, which reduces risk of recurrent thrombosis
  - Standardized UFH nomograms/protocols reduce the risk of adverse events, such as bleeding and thrombosis
  - Heparin-induced 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!

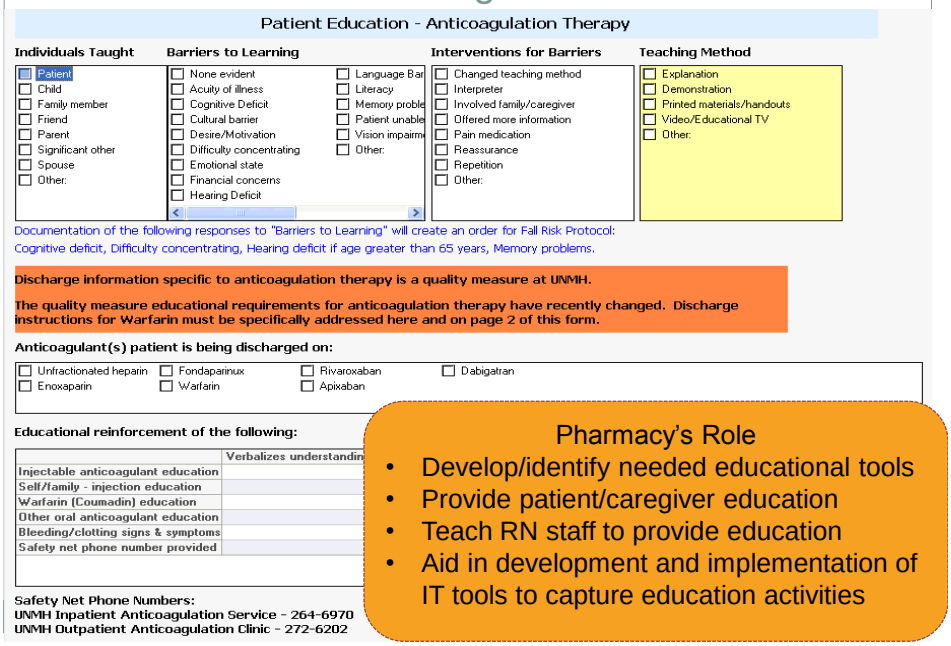
May lead to "benchmarking mediocrity

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



Patient Education - Anticoagulation Therapy

**Individuals Taught**
- ☐ Patient
- ☐ Child
- ☐ Family member
- ☐ Friend
- ☐ Parent
- ☐ Significant other
- ☐ Spouse
- ☐ Other:

**Barriers to Learning**
- ☐ None evident
- ☐ Acuity of illness
- ☐ Cognitive Deficit
- ☐ Cultural barrier
- ☐ Desire/Motivation
- ☐ Difficulty concentrating
- ☐ Emotional state
- ☐ Financial concerns
- ☐ Hearing Deficit
- ☐ Language Bar
- ☐ Literacy
- ☐ Memory proble
- ☐ Patient unable
- ☐ Vision impairm
- ☐ Other:

**Interventions for Barriers**
- ☐ Changed teaching method
- ☐ Interpreter
- ☐ Involved family/caregiver
- ☐ Offered more information
- ☐ Pain medication
- ☐ Reassurance
- ☐ Repetition
- ☐ Other:

**Teaching Method**
- ☐ Explanation
- ☐ Demonstration
- ☐ Printed materials/handouts
- ☐ Video/Educational TV
- ☐ Other:

Documentation of the following responses to "Barriers to Learning" will create an order for Fall Risk Protocol:
Cognitive deficit, Difficulty concentrating, Hearing deficit if age greater than 65 years, Memory problems.

**Discharge information specific to anticoagulation therapy is a quality measure at UNMH.**

**The quality measure educational requirements for anticoagulation therapy have recently changed. Discharge instructions for Warfarin must be specifically addressed here and on page 2 of this form.**

**Anticoagulant(s) patient is being discharged on:**

- ☐ Unfractionated heparin
- ☐ Enoxaparin
- ☐ Fondaparinux
- ☐ Warfarin
- ☐ Rivaroxaban
- ☐ Apixaban
- ☐ Dabigatran

**Educational reinforcement of the following:**

| | Verbalizes understandin |
|---|---|
| Injectable anticoagulant education | |
| Self/family - injection education | |
| Warfarin (Coumadin) education | |
| Other oral anticoagulant education | |
| Bleeding/clotting signs & symptoms | |
| Safety net phone number provided | |

**Safety Net Phone Numbers:**
**UNMH Inpatient Anticoagulation Service - 264-6970**
**UNMH Outpatient Anticoagulation Clinic - 272-6202**

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

SCIP Surgical Care Improvement Project
A National Quality Partnership

# 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 P…ts with Controlled Postoperative Blood Glucose (≤ 180mg/d… the time- frame of 18 to 24 Hours after Anesthesia End Ti… |
| SCIP-Inf-6 | • Appropriate Hair Remo…l (no razors) |
| SCIP-Inf-9 | • Urinary catheter removed Post… 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) |
| 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 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]<br>**If β-lactam allergy**:<br>Vancomycin[2] or Clindamycin[2] |
| **Hip Arthroplasty or Knee Arthroplasty** | Cefazolin or Vancomycin[1]<br>**If β-lactam allergy**:<br>Vancomycin[2] or Clindamycin[2] |
| **Colon Surgery** | Ampicillin/Sulbactam or<br>Metronidazole + Cefazolin or<br>Metronidazole + Ceftriaxone<br>**If β-lactam allergy**:<br>Clindamycin + Aminoglycoside or<br>Clindamycin + Quinolone or<br>Metronidazole + Aminoglycoside or<br>Metronidazole + Quinolone |
| **Abdominal Hysterectomy or Vaginal Hysterectomy** | Cefazolin or Cefuroxime or Ampicillin/Sulbactam<br>**If β-lactam allergy:**<br>Clindamycin + Aminoglycoside or<br>Clindamycin + Quinolone or<br>Metronidazole + Aminoglycoside or<br>Metronidazole + Quinolone or<br>Vancomycin + Aminoglycoside or<br>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<br>**If β-lactam allergy:**<br>Clindamycin + Aminoglycoside or<br>Clindamycin + Quinolone or<br>Metronidazole + Aminoglycoside or<br>Metronidazole + Quinolone or<br>Vancomycin + Aminoglycoside or<br>Vancomycin + Quinolone |

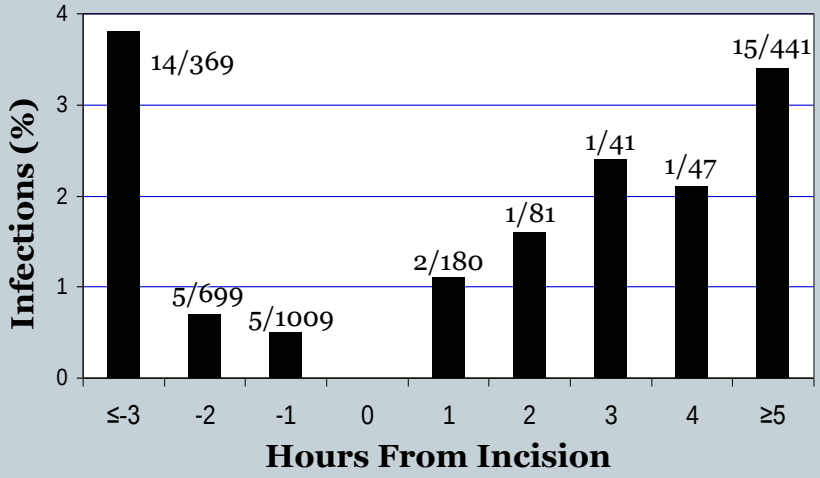
## SCIP-Inf-1 & 2 → Exclusions

- < 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

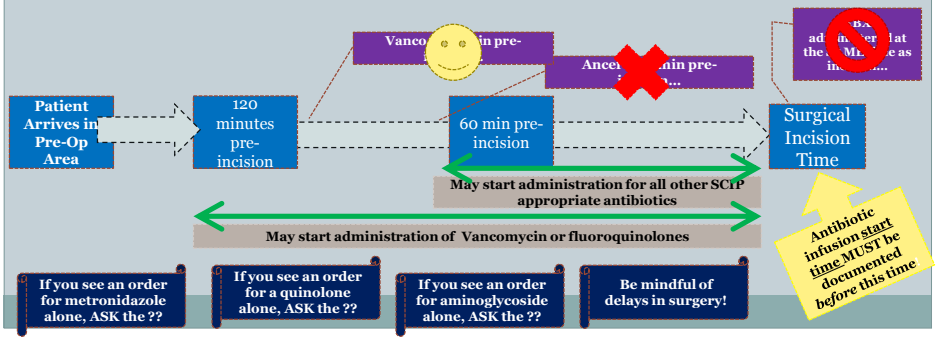
- Prophylactic antibiotic must be received within one hour prior to surgical incision.
- **This is measured by checking the earliest documented start time for the ordered antibiotic and comparing it to the surgical incision date and time for the procedure. To meet the measure the time cannot exceed 60 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]<br>**If β-lactam allergy**:<br>Vancomycin[2] or Clindamycin[2] |
| **Hip Arthroplasty or Knee Arthroplasty** | Cefazolin or Vancomycin[1]<br>**If β-lactam allergy**:<br>Vancomycin[2] or Clindamycin[2] |
| **Colon Surgery** | Ampicillin/Sulbactam or<br>Metronidazole + Cefazolin or<br>Metronidazole + Ceftriaxone<br>**If β-lactam allergy**:<br>Clindamycin + Aminoglycoside or<br>Clindamycin + Quinolone or<br>Metronidazole + Aminoglycoside or<br>Metronidazole + Quinolone |
| **Abdominal Hysterectomy or Vaginal Hysterectomy** | Cefazolin or Cefuroxime or Ampicillin/Sulbactam<br>**If β-lactam allergy:**<br>Clindamycin + Aminoglycoside or<br>Clindamycin + Quinolone or<br>Metronidazole + Aminoglycoside or<br>Metronidazole + Quinolone or<br>Vancomycin + Aminoglycoside or<br>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<br>**If β-lactam allergy:**<br>Clindamycin + Aminoglycoside or<br>Clindamycin + Quinolone or<br>Metronidazole + Aminoglycoside or<br>Metronidazole + Quinolone or<br>Vancomycin + Aminoglycoside or<br>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:<br>Cefazolin 1 gm<br>Vancomycin 1 gm<br>Clindamycin 600 mg<br>Gentamicin 1.7 mg/kg | Recommends higher doses:<br>Cefazolin 2 gm<br>Vancomycin 15 mg/kg<br>Clindamycin 900 mg<br>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<br>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 |

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**Recommended Intravenous Antimicrobials for Surgical Procedures***

| Operative Procedure | Common Pathogens | Recommended Antimicrobials[a,b,c] NO ALLERGIES | β-Lactam Allergy[c] | Post Operative Duration |
|---|---|---|---|---|
| *Cardiac*[§,Φ] | S. epidermidis, S.aureus | **Cefazolin** | **Vancomycin** | Discontinue within **48** hrs of end anesthesia time |
| *Thoracic*[§] *(non cardiac)* | *S.aureus, S.epidermidis,* streptococci, enteric gram-negative bacilli | **Cefazolin** | **Vancomycin** | Discontinue within **24** hrs of end anesthesia time |
| *Gastrointestinal* | | | | |
| **Small Intestine** (non obstructed), **Gastroduodenal** [Φ] Including: PEG placement/revision | Enteric gram-negative bacilli, gram positive cocci | For high risk patients[d]: **Cefazolin** or Ampicillin/sulbactam | **Clindamycin** *plus either* **Gentamicin** or **Ciprofloxacin** or **Levofloxacin**[f] | Discontinue within **24** hrs of end anesthesia time |
| Small Intestine (obstructed) | Enteric gram-negative bacilli, gram positive cocci | **Cefazolin** *plus* **Metronidazole** | **Metronidazole** *plus either* **Gentamicin** or **Ciprofloxacin** or **Levofloxacin**[f] | |
| **Biliary** [Φ] | Enteric gram-negative bacilli, gram positive cocci | For open procedure or high risk patients[a,b]: **Cefazolin** *plus* **Metronidazole**[i] | **Clindamycin** *plus either* **Gentamicin** or **Ciprofloxacin** or **Levofloxacin**[f] | |
| **Colorectal**[§], **Appendectomy**[g] (non-perforated) | Enteric gram-negative bacilli, anaerobes, enterococci | **Cefazolin** *plus* **Metronidazole**[i] | **Clindamycin** *plus either* **Gentamicin** or **Ciprofloxacin** or **Levofloxacin**[f] | |
| *Head and Neck* [Φ] Contaminated | Anaerobes, Enteric gram-negative bacilli, *S.aureus,* streptococci | **Cefazolin** *plus* **Metronidazole** | **Clindamycin** | Discontinue within **24** hrs of end anesthesia time |
| *Neurosurgery* [Φ] | *S.aureus, S.epidermidis* | **Cefazolin** | **Clindamycin** or **Vancomycin** | Discontinue within **24** hrs of end anesthesia time |
| *Orthopedic* [Φ] Including: Spinal, Hip and Knee Arthroplasty[§] | *S.aureus, S.epidermidis* | **Cefazolin** | **Clindamycin** or **Vancomycin** | Discontinue within **24** hrs of end anesthesia time |
| **Hysterectomy**[§, Φ], **Cesarean Delivery** | Enteric gram-negative bacilli, anaerobes, Gp B strep, enterococci | **Cefazolin** *or* **Ampicillin/Sulbactam** | **Clindamycin or Vancomycin** *plus either* **Gentamicin** or **Ciprofloxacin**[f] | Discontinue within **24** hrs of end anesthesia time |
| *Urologic* [Φ] | | | | |
| **Instrumentation** (with risk factors for infection) | *E. coli, S. aureus, S.epidermidis,* Gp A *Streptococcus* | | | |
| **Clean** (without entry into urinary tract) | *E. coli, S. aureus, S.epidermidis,* Gp A *Streptococcus* | | | |
| | gram-negative bacilli*** | | | anesthesia time |

**Antibiotic Guidelines should be developed by pharmacy for distribution and posting in all surgical rooms!**

**Consistent SCIP antibiotics loaded in OR holding and anesthesia Pyxis stations to minimize error and cost**

**Determine availability of dosage forms and consider ease of use (i.e. IV push, historical shortage issues…)**

# Vancomycin Documentation Criteria

| **If Vancomycin is ordered, <u>one of the following MUST be documented pre-operatively</u> 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 | | Half-Life in Adults with Normal Renal Function, hr | Recommended Redosing Interval (from initiation of preoperative dose), hr[c] | Infusion Duration[h] (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[R] | 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[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[R] | 400 mg | 10 mg/kg | 8 | | 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 | 0.1 | | 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[h] (minutes) |
|---|---|---|---|---|---|
| | Adult[a] | Pediatrics[b] | | | |
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| 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?
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- Which drug should you use?
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- **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 pathogens*

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 but … 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)<br>❑ Low-dose unfractionated heparin (LDUH)<br>❑ Intermittent pneumatic compression devices (IPC) with or without graduated compression stockings (GCS)<br>❑ LDUH or LMWH combined with IPC or GCS<br>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)<br>❑ Low-dose unfractionated heparin (LDUH)<br>❑ Factor Xa Inhibitor (fondaparinux)<br>❑ Intermittent pneumatic compression devices (IPC) | |
| **Gynecologic Surgery** | **Select from any of the following** |
| ❑ Low molecular weight heparin (LMWH)<br>❑ Low-dose unfractionated heparin (LDUH)<br>❑ Factor Xa Inhibitor (fondaparinux)<br>❑ Intermittent pneumatic compression devices (IPC)<br>❑ 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)<br>❑ Low-dose unfractionated heparin (LDUH)<br>❑ Factor Xa Inhibitor (fondaparinux)<br>❑ Intermittent pneumatic compression devices (IPC)<br>❑ 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)<br>❑ Low-dose unfractionated heparin (LDUH)<br>❑ Factor Xa Inhibitor (fondaparinux)<br>❑ Oral Factor Xa Inhibitor (Rivaroxaban)<br>❑ Aspirin<br>❑ Warfarin<br>❑ Intermittent pneumatic compression devices (IPC)<br>❑ 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)<br>❑ Low-dose unfractionated heparin (LDUH)<br>❑ Factor Xa Inhibitor (fondaparinux)<br>❑ Aspirin<br>❑ Warfarin<br>❑ Intermittent pr | |

**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.<br>•Document suspected/diagnosed infections clearly.<br>•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.<br>•Document suspected/diagnosed infections clearly.<br>•MDs must use appropriate prophylactic antibiotic<br>•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<br>•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:<br>1. Patients with a LOS postoperatively < 2 days: Looking for documentation of administration of BB the day prior to or the day of surgery<br>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<br>•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.<br>•A reason must be noted each day the BB is held or not administered.<br>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?