

SURGICAL INFECTIONS

UTHSC
DEPARTMENT OF SURGERY

DOUBLE EDGED SWORD

- PROS
 - Prevent infection
 - Treat infection
- CONS
 - Adverse events
 - Expense
 - Increased resistance

PREVENTION

- Preoperative/perioperative if emergent
- Target most common organisms involved with that procedure/organ
- Not necessary if low risk
- Necessary if catastrophic consequences
- Usually IV, can be oral e.g. bowel prep
- Topical ineffective
- Not helpful if continued contamination

RISK FACTORS

- Age
- Malnutrition
- Obesity
- Immunosuppression
- Concurrent infection
- Lengthy procedure
- Lengthy prehospital stay
- Transfusion

RISK FACTORS

- Devitalized tissue
- Poor tissue perfusion
- Foreign body
- Hematomas/seromas
- Lengthy prehospital stay
- Poor technique

CLEAN

- Uninfected/un-inflamed operative wound
- Closed primarily
- No entry of GI, GU respiratory or biliary tracts

CLEAN-CONTAMINATED

- Elective GI, GU, respiratory, biliary tract with minimal spillage
- No evidence of infection
- No unusual contamination

CONTAMINATED

- Non-purulent inflammation
- Gross spillage from GI tract
- penetrating wounds less than 4 hours
- Major break in aseptic technique

DIRTY-INFECTED

- Purulence
- Preoperative visceral perforation
- Penetrating wounds greater than 4 hours
- Devitalized tissue

RISK OF INFECTION

CONTAMINATION LEVEL	% RISK
CLEAN	<2
CLEAN-CONTAMINATED	<10
CONTAMINATED	20
DIRTY	40

LENGTH OF TREATMENT

CONTAMINATION LEVEL	DAYS
CLEAN	none
CLEAN-CONTAMINATED	preop
CONTAMINATED	Preop/24 hours
DIRTY	24 hours up to 3-5 days

INTRAOPERATIVE MANAGEMENT

- Debride dead tissue
- Remove foreign bodies
- Do not close infected wounds
- Must cover vessels, bone
- May take multiple procedures
- Try to use monofilament suture
- Closed suction drain
- Consider delayed primary or secondary closure

POSTOPERATIVE FEVER

- “Wind water, wound”
- Consider procedure performed (including anesthesia)
- Consider procedure specific causes
- Consider patient co-morbidities
- Consider drugs (process of exclusion)

POSTOPERATIVE FEVER

DAY	CAUSE
1-7	“Wind” (atelectasis, pneumonia) “Surgical Misadventure” “Necrotizing Soft Tissue Infection”
3	“Water” (UTI) “Line”
5	“Wound” (superficial wound infection) “Walk” (DVT)
7	Deep Wound Infections

POSTOPERATIVE FEVER

- Examine patient ESPECIALLY wound
- Consider CXR, CBC, U/A, blood cultures, imaging
- Consider procedure performed (including anesthesia)
- Consider procedure specific causes
- Consider patient co-morbidities
- Consider drugs (process of exclusion)

“WIND”

- Prevention ?

“WIND”

- Prevention – ambulation/incentive spirometer, chest PT, flutter valve, inhalers if reactive airway

“WIND”

- Prevention – ambulation, incentive spirometer, chest PT, flutter valve, inhalers if reactive airway
- Diagnosis?

“WIND”

- Prevention – ambulation, incentive spirometer, chest PT, flutter valve, inhalers if reactive airway
- Diagnosis – auscultation, CXR, CBC, sputum worthless, bronchoscopy if ventilated

“WIND”

- Prevention – ambulation, incentive spirometer, chest PT, flutter valve, inhalers if reactive airway
- Diagnosis – auscultation, CXR, CBC, sputum worthless, bronchoscopy if ventilated
- Treatment?

“WIND”

- Prevention – ambulation, incentive spirometer, chest PT, flutter valve, inhalers if reactive airway
- Diagnosis – auscultation, CXR, CBC, sputum worthless, bronchoscopy if ventilated
- Treatment – ambulation, incentive spirometry, chest PT, etc...antibiotics if pneumonia likely

“WATER”

- Prevention?

“WATER”

- Prevention – delay surgery if UTI, minimize GU instrumentation, remove Foley ASAP, silver coated catheter if can't remove

“WATER”

- Prevention – delay surgery if UTI, minimize GU instrumentation, remove Foley ASAP, silver coated catheter if can't remove
- Diagnosis?

“WATER”

- Prevention – delay surgery if UTI, minimize GU instrumentation, remove Foley ASAP, silver coated catheter if can't remove
- Diagnosis – patient symptoms, examine Foley fluid, U/A, ***POSSIBLE urine/blood cultures***, CBC

“WATER”

- Prevention – delay surgery if UTI, minimize GU instrumentation, remove Foley ASAP, silver coated catheter if can't remove
- Diagnosis – patient symptoms, examine Foley fluid, U/A, ***POSSIBLE urine/blood cultures***, CBC
- Treatment?

“WATER”

- Prevention – delay surgery if UTI, minimize GU instrumentation, remove Foley ASAP, silver coated catheter if can't remove
- Diagnosis – patient symptoms, examine Foley fluid, U/A, ***POSSIBLE urine/blood cultures***, CBC
- Treatment – remove Foley, antibiotics

“LINE”

- Prevention?

“LINE”

- Prevention – use peripheral for short term, midline or PICC for longer, appropriate insertion technique and maintenance, minimize instrumentation, remove ASAP, use upper extremity, remove emergent /femoral lines within 24 hours of insertion

“LINE”

- Prevention – use peripheral for short term, midline or PICC for longer, appropriate insertion technique and maintenance, minimize instrumentation, remove ASAP, use upper extremity, remove emergent /femoral lines within 24 hours of insertion
- Diagnosis?

“LINE”

- Prevention – use peripheral for short term, midline or PICC for longer, appropriate insertion technique and maintenance, minimize instrumentation, remove ASAP, use upper extremity, remove emergent /femoral lines within 24 hours of insertion
- Diagnosis – cellulitis at site, fever, elevated WBC, positive blood culture through line, culture line

“LINE”

- Prevention – use peripheral for short term, midline or PICC for longer, appropriate insertion technique and maintenance, minimize instrumentation, remove ASAP, use upper extremity, remove emergent /femoral lines within 24 hours of insertion
- Diagnosis – cellulitis at site, fever, elevated WBC, positive blood culture through line, culture line
- Treatment?

“LINE”

- Prevention – use peripheral for short term, midline or PICC for longer, appropriate insertion technique and maintenance, minimize instrumentation, remove ASAP, use upper extremity, remove emergent /femoral lines within 24 hours of insertion
- Diagnosis – cellulitis at site, fever, elevated WBC, positive blood culture through line, culture line tip
- Treatment – remove line, antibiotics if pus at site, positive blood cultures or suspicious due to symptoms
- **excise vein if suppurative thrombophlebitis

“WOUND” (superficial SSI)

- Prevention?

“WOUND”(superficial SSI)

- Prevention – appropriate prophylaxis, impeccable technique, ?sterile dressing changes?, good general hygiene

“WOUND”(superficial SSI)

- Prevention – appropriate prophylaxis, impeccable technique, ?sterile dressing changes?, good general hygiene
- Diagnosis?

“WOUND”(superficial SSI)

- Prevention – appropriate prophylaxis, impeccable technique, ?sterile dressing changes?, good general hygiene
- Diagnosis- examine wound for erythema, pain, purulent drainage

“WOUND”(superficial SSI)

- Prevention – appropriate prophylaxis, impeccable technique, ?sterile dressing changes?, good general hygiene
- Diagnosis- examine wound for erythema, pain, purulent drainage
- Treatment?

“WOUND”(superficial SSI)

- Prevention – appropriate prophylaxis, impeccable technique, ?sterile dressing changes?, good general hygiene
- Diagnosis- examine wound for erythema, pain, purulent drainage
- Treatment – OPEN WOUND, no antibiotics necessary IF no cellulitis

“WALK” (DVT)

- LOW grade fever
- Rarely elevated WBC
- Prevention – SCD’s, chemical prophylaxis
- Diagnosis – examine (unreliable), imaging “usually US)
- Treatment - anticoagulation

“SURGICAL MISADVENTURE/MISSED HOLLOW VISCUS INJURY”

- Can present hours/days
- Catastrophic
- High fever
- Elevated WBC
- Mental status changes
- AKI
- Treatment?

“NECROTIZING SOFT TISSUE INFECTION”

- Severe pain
- High fever
- Elevated WBC
- Unusual drainage
- Likely significant cellulitis
- Treatment?

“DEEP WOUND INFECTION”

- Intraabdominal abscess
- Mediastinitis
- Empyema
- Joint infection
- Prosthetic infection

“DEEP WOUND INFECTION”

- Intraabdominal abscess
 - dx with imaging (CT) and drain (usually IR not surgery)
- Mediastinitis
 - dx with PE/imaging, treatment surgical debridement with subsequent flap
- Empyema
 - Dx with imaging, treatment chest tube, thoracoscopy/thoracotomy
- Prosthetic infection
 - Treatment usually removal

SURGICAL “ZEBRAS”

- Otitis/sinusitis
- Endocarditis
- Meningitis/epidural abscess
- Parotitis/dental infections/abscesses
- H pylori
- Thyroid storm
- Drug reaction/malignant hyperthermia

QUESTIONS?