



Antimicrobial Therapy for Surgical Patients

ผศ. นพ. กำธร มาลาธรรม

คณะแพทยศาสตร์โรงพยาบาลรามาธิบดี



Outline

2

- ★ Surgical prophylaxis
- ★ Common infections
- ★ Selection of suitable drugs



Indication for Surgical Prophylaxis

3

- ★ Procedures that entail entry into the gastrointestinal tract (A, I),
- ★ Head and neck procedures that entail entry into the oropharynx (A, I)
- ★ Abdominal and lower-extremity vascular procedures (A, I)
- ★ Craniotomy (A, I)
- ★ Orthopedic procedures with hardware insertion (A, I)
- ★ Cardiac procedures with median sternotomy (A, I)
- ★ Hysterectomy (A, I), cesarean section,
- ★ Procedures that include the implantation of permanent prosthetic materials (B, III).



Principles

4

- ★ Use a narrow-spectrum but sufficient to cover possible organisms
 - ★ Cefazolin is recommended for most surgery
 - ★ GI, GU surgery may need cefuroxime, ampicillin-sulbactam
- ★ Timing: 30 – 60 minutes prior to incision
- ★ Redose if prolonged operation
- ★ No ATB beyond 24 hours after surgery



Common infections

5

★ Skin and soft tissue

- ★ Uncomplicated

- ★ Complicated

 - ★ Diabetic ulcer

 - ★ Unstable vital sign/ disseminated infection

 - ★ Involve bone and tendon

 - ★ Decubitus ulcer

★ GI

★ GU



6

Example



Present illness



- ★ Known case
 - ★ CA Breast s/p in remission
 - ★ CA ovary c peritoneal metastasis s/p in remission
 - ★ CA endometrium stage III C1 (carcinosarcoma) s/p in remission
 - ★ Severe AS c severe TR c moderate MR s/p transferral TAVI
 - ★ TVD with LM disease with ischemic cardiomyopathy
 - ★ Hypertension
 - ★ Dyslipidemia
 - ★ Diabetes mellitus type2



Present illness

- ★ 7 ชั่วโมงก่อนมาโรงพยาบาล ผู้ป่วยมีอาการหายใจหอบเหนื่อย ตัวร้อน หนาวสั่น แต่ไม่ได้วัดไข้ สามารถพยุงเดินไปเข้าห้องน้ำได้ ปัสสาวะออกปกติ ไม่มีแขนขาบวมหรือบวมแดงร้อนมากขึ้น รู้ตัวรู้เรื่องดี
- ★ 4 ชั่วโมงก่อนมาโรงพยาบาล ผู้ป่วยรู้สึกเหนื่อยมากขึ้น ญาติสังเกตว่าหายใจเร็ว อาเจียน 3 ครั้ง ครั้งละครึ่งแก้วเป็นเศษอาหารที่กินและน้ำลาย ไม่สำลัก ไม่มีเลือดปน ไม่มีท้องเสียถ่ายเหลว ไม่มีปัสสาวะแสบขัด ญาติสังเกตว่าผู้ป่วยมีอาการซึมมากขึ้น เหนื่อยมากขึ้น ตัวร้อนหนาวสั่น จึงพาผู้ป่วยมาโรงพยาบาล

At ER



2:57 AM

- ★ ผู้ป่วยมีอาการซึมมาก เรียกไม่รู้ตัว เหนื่อย มีไข้
- ★ Vital sign: BP 81/49 mmHg PR 99bpm RR 40/min BT 38.4° C
 - ★ An elderly Thai female drowsiness look dyspnea tachypnea
 - ★ Lungs : fine crepitation left lower lung
 - ★ Left arm : markedly swollen
 - ★ Extremities : pitting edema 1+ both legs

At ER



- ★ 3:10 AM
- ★ ผู้ป่วยมีอาการเหนื่อยมากขึ้น
- ★ On BIPAP (14:7) RR 16 FiO₂ 0.4
- ★ Septic work up, empirical ATB: piperacillin–tazobactam 4.5g IV

At ER

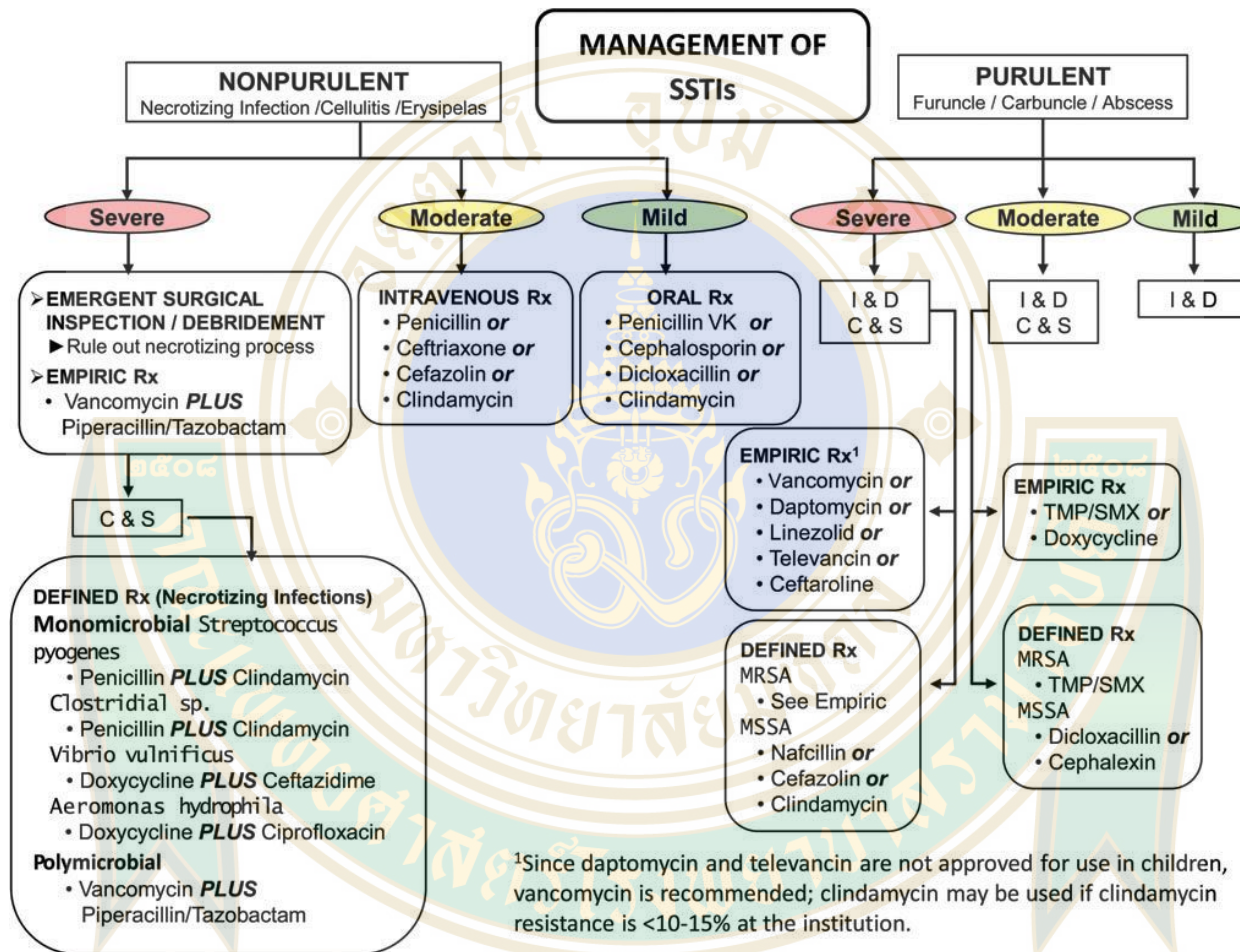


5:30 am

- ★ BP : MAP <65mmHg
- ★ สังเกตว่าแขนซ้ายเริ่มบวม & คล้ำมากขึ้น
- ★ Imp: Cellulitis
- ★ Switch ATB to Vancomycin & Meropenem







¹Since daptomycin and televancin are not approved for use in children, vancomycin is recommended; clindamycin may be used if clindamycin resistance is <10-15% at the institution.



Severity of infection

14

- ★ Purulent:
 - ★ Mild infection, incision and drainage is indicated
 - ★ Moderate infection: patients with purulent infection with systemic signs of infection
 - ★ Severe infection: patients who have failed incision and drainage plus oral antibiotics or those with systemic signs of infection such as temperature $>38^{\circ}$ C, tachycardia (heart rate >90 beats per minute), tachypnea (respiratory rate >24 breaths per minute) or abnormal white blood cell count ($>12\ 000$ or <400 cells/ μ L), or immunocompromised patients.



Severity of infection

15

- ★ Nonpurulent SSTIs
 - ★ Mild infection: typical cellulitis/ erysipelas with no focus of purulence
 - ★ Moderate infection: typical cellulitis/erysipelas with systemic signs of infection
 - ★ Severe infection: patients who have failed oral antibiotic treatment or those with systemic signs of infection (as defined above under purulent infection), or those who are immunocompromised, or those with clinical signs of deeper infection such as bullae, skin sloughing, hypotension, or evidence of organ dysfunction



Diagnostic issues

16

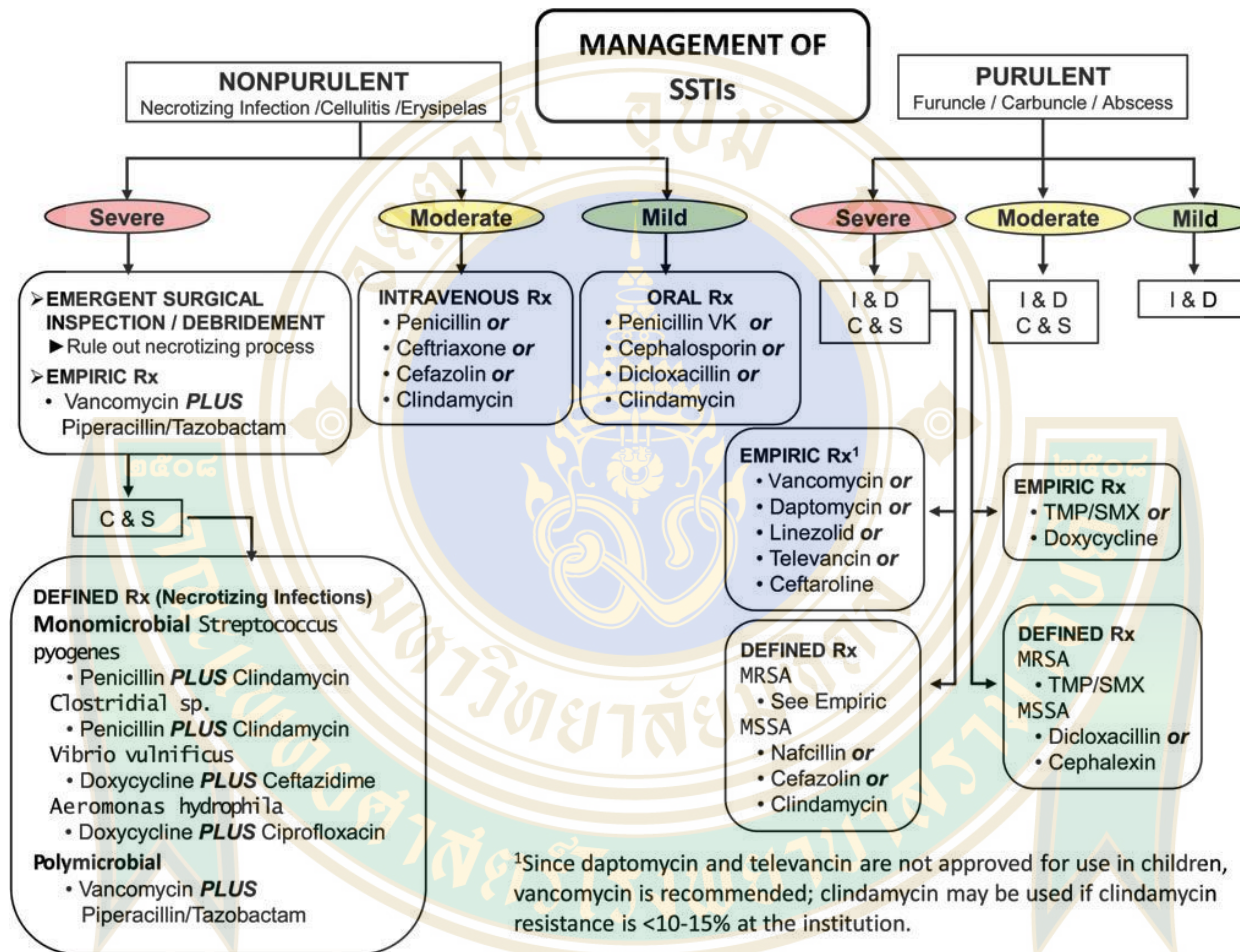
- ★ Tissue fluid/ tissue Gram stain and culture
- ★ Ultrasound cannot distinguish necrotizing fasciitis from simple cellulitis
- ★ Necrotizing fasciitis is a clinical diagnosis



Things to consider when choosing ATB

17

- ★ Severity
- ★ Exposure
 - ★ No obvious exposure
 - ★ Presence of risk factors: previous surgery, edematous limbs
 - ★ Expose to aquatic or terrestrial environment
 - ★ Bites (human or animal, NOT include snake and venomous insect)
- ★ Host factors: DM, farmer, alcoholic, neutropenic, steroid user
- ★ Clinical course



¹Since daptomycin and televancin are not approved for use in children, vancomycin is recommended; clindamycin may be used if clindamycin resistance is <10-15% at the institution.



1. Carbapenem or fluoroquinolones are not recommended as appropriate agents for empirical treatment of skin and soft tissue infections.
2. Surgical debridement and drainage are life-saving procedures that must be performed in a timely manner – we rely on you!



Diabetic foot ulcers

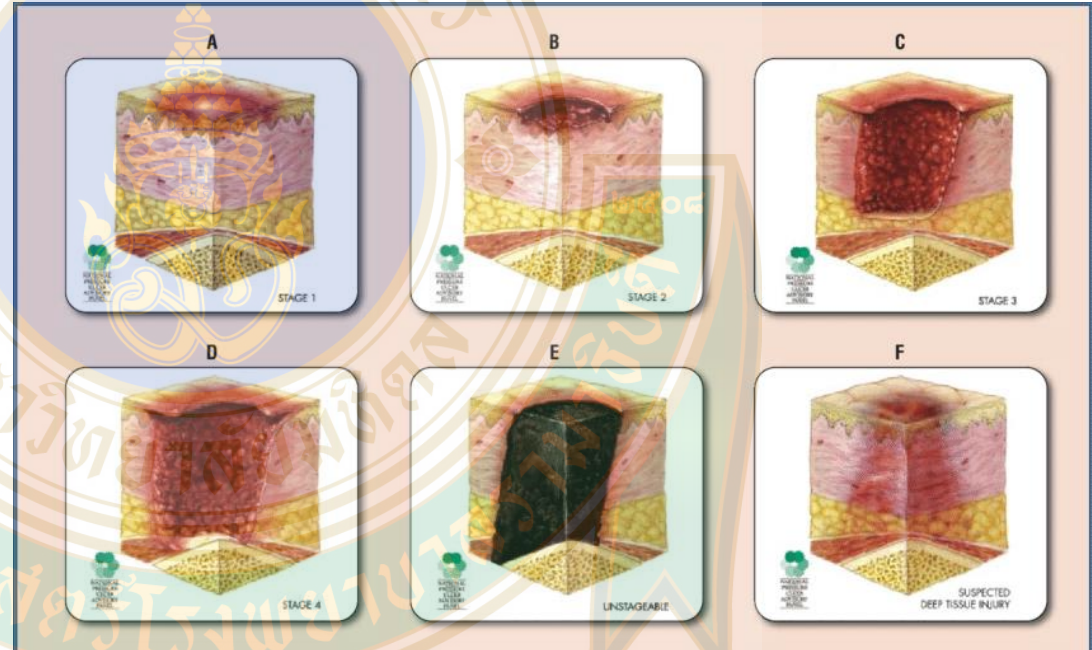
20

- ★ Assessment of vascular supply
- ★ Initial treatment: cefazolin, amoxicillin/clavulanate or ampicillin/sulbactam
- ★ Culture-directed therapy for non-responders
- ★ Surgical debridement is frequently needed

Decubitus ulcers

21

- ★ Eradicate infection
 - ★ Culture directed therapy
 - ★ Surgical debridement
 - ★ Prevent superimposed infection
- ★ Minimize pressure load
- ★ Nutrition





Infection in the abdomen

22

- ★ Generally ceftriaxone provide enough coverage
- ★ Anti-anaerobic (metronidazole or clindamycin) is indicated in LOWER abdominal infection
- ★ Risk of infection by drug-resistant organisms are previous exposure to antibiotics, previous hospitalization, prolonged use of medical devices



Urinary tract infection

23

- ★ Symptoms come first
- ★ In the catheterized patient
 - ★ Pyuria is not diagnostic of CA-bacteriuria or CA-UTI
 - ★ Odor or turbidity of urine has no diagnostic value, do not send urine for microbiologic studies in asymptomatic patients
 - ★ Febrile pyuria may be caused by symptomatic UTI if there is no alternative explanation



Conditions that do not need antibiotics

24

- ★ Upper respiratory tract infection
- ★ Asymptomatic bacteriuria
- ★ Diarrhea: both acute and chronic
- ★ Clean wound, including non-inflamed chronic ulcers



Important side effects of some ATB

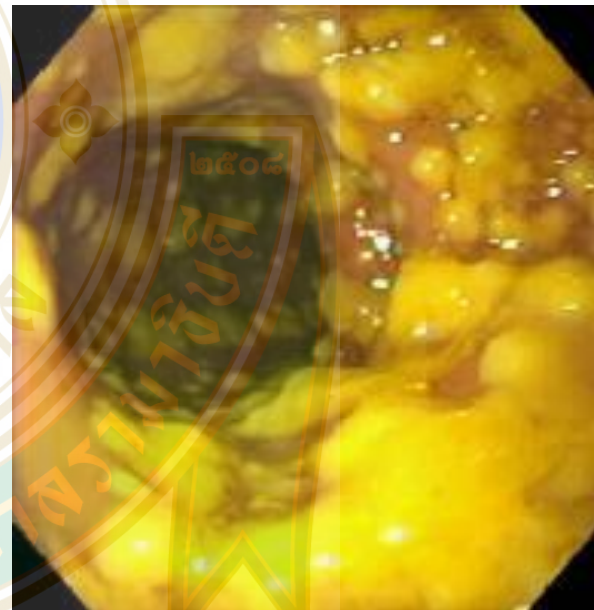
25

- ★ Ertapenem: CNS (seizure, confuse, agitate, alteration of consciousness), esp. in elderly/ ESRD/ pt. with hypoalbuminemia
- ★ Fluoroquinolones: cardiac arrhythmia, dysglycemia, neuropsychiatric incl. coma/ depression/ seizure, tendenitis, rupture aortic aneurysm

Increasing drug-resistant organism

26

CRE case/1000 admission



Pseudomembranous colitis

