
بسم الله الرحمن الرحیم

ANTIMICROBIAL PROPHYLAXIS IN PEDIATRIC SURGICAL PATIENTS

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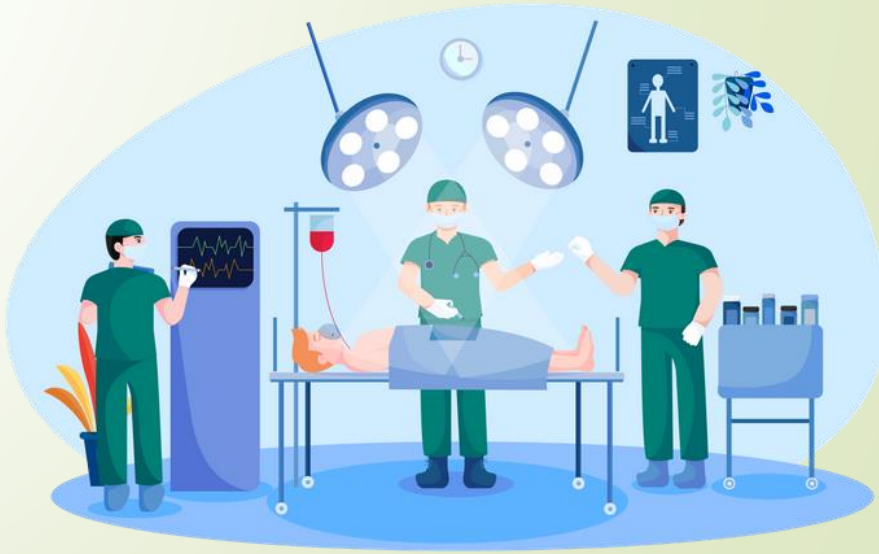


- Surgical site infection(SSIs) complicate 2% of surgical procedures,
- prolong the length of hospitalization
- increase the risk of death.

Prevention of postoperative wound infection through perioperative prophylaxis is recommended for

- procedures with moderate or high infection rate

OR

- procedures with great consequence of postoperative wound infection(implantation of prosthetic material in heart)

- If tissue site already infected such as ruptured appendix treatment with antibiotics are used rather than prophylaxis

Indication for prophylaxis

- Major determination of SSIs include:
- The number of microorganisms
- The presence of foreign body in the wound
- Host risk factors

Major determination of SSIs (continue)

- Obesity
- Coexistent infections at a remote body site
- Altered immune response
- Colonization with pathogenic microorganisms
- Diabetes mellitus

Classification

- Clean wounds
- Clean contaminated wounds
- Contaminated wounds
- Dirty and infected wounds

Clean wound

- Clean wounds are uninfected operative wounds in which no inflammation is encountered(usually elective, primarily closed)
- The respiratory, alimentary, and genitourinary tracts or oropharyngeal cavity are not entered
- Operative incisional wounds that follow blunt trauma are included in this category provided that the surgical procedure dose not involve entry into the gastrointestinal or genitourinary tracts

Clean wound

- The risk of infection is low(<1%)
- Some exception in which prophylaxis is administered
  - Implantation of intravascular

deep tissue prosthetic material(insertion of a prosthetic heart valve

  - prosthetic joint
  - Open heart surgery for repair of structural defect
  - Body cavity exploration in neonates
  - Most neurosurgical operation

CLEAN-CONTAMINATED WOUNDS

The respiratory, alimentary or genitourinary tracts are entered under controlled conditions without significant contamination

Operations involving the gastrointestinal tract, the biliary tract, appendix, vagina, or oropharynx and urgent or emergency surgery in an otherwise clean procedure are included in this category, provided that no evidence of infection

infection risk:3-15%

- **Prophylaxis in pediatric patients is included:**
- All GI tract procedures with obstruction, using the H2 blocker or PPI, permanent foreign body
- Selected biliary tract obstruction
- Urinary tract surgery or instrumentation in presence of bacteriuria or obstructive uropathy.

Cotaminated wounds

- Contaminated wounds are previously sterile tissue sites are likely to be contaminated with bacteria include:
- Open, fresh wounds, operative wounds in the setting of major breaks in aseptic technique or gross spillage from the GI
- Exposed viscera at birth from congenital anomalies
- Penetrating trauma of fewer than 4 hours duration
- Incisions in which acute non purulent inflammation

Estimated rate of infection: 15%

Prophylaxis is appropriate for some patient with acute nonpurulent inflammation(non perforated appendicitis ,cholecystitis)

Antimicrobial use should be considered as treatment rather than prophylaxis, for wounds in which bacteria have had an opportunity to establish ongoing infection

Dirty and infected wounds

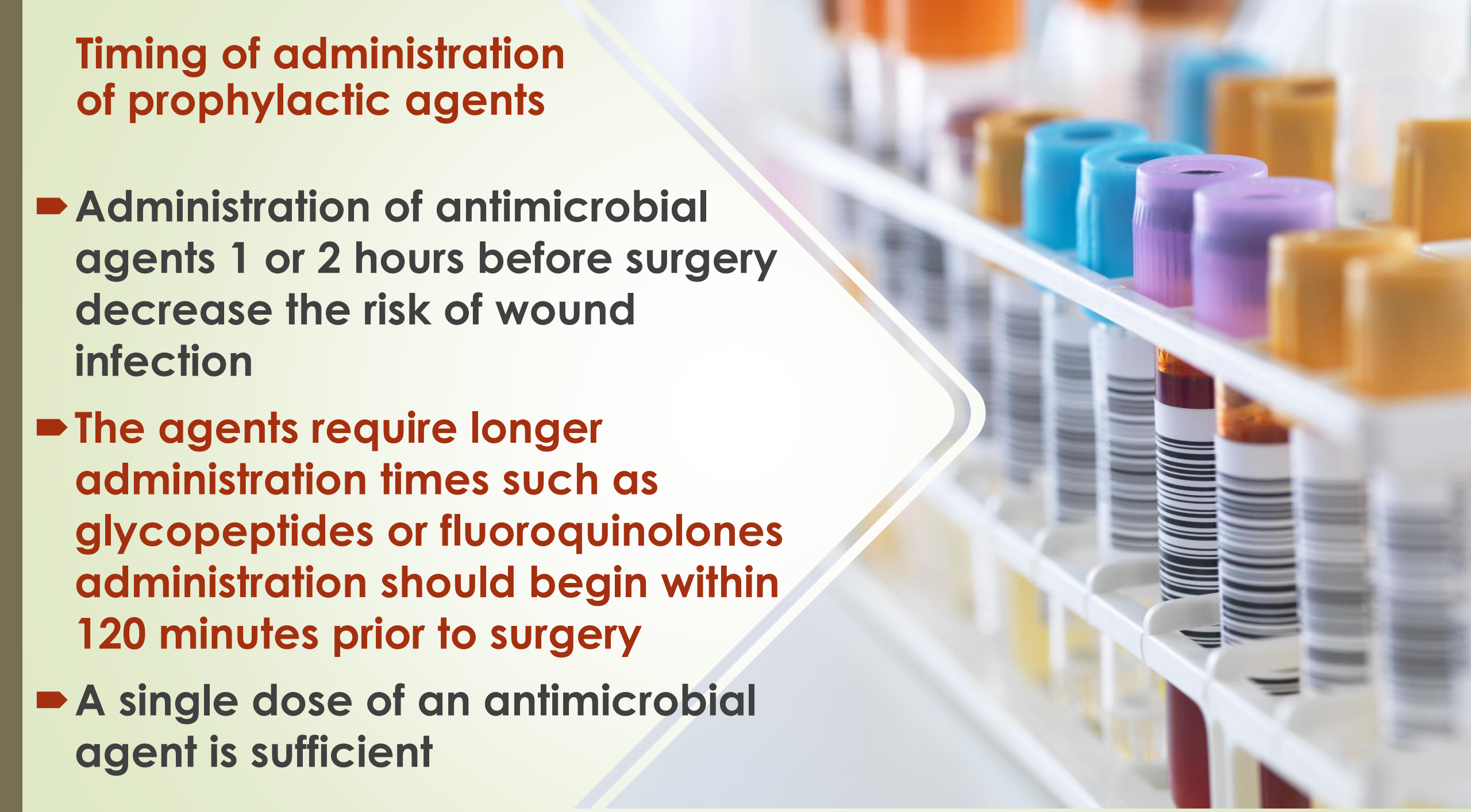
- Penetrating trauma of more than **4 hours**' duration from time of occurrence
- **Wounds with retained devitalized tissue**
- **Wounds involving existing clinical infection or perforated viscera**
- **Estimated rate of infection: 40%**
- The organisms were present in the operative field before surgery

Antimicrobial agents are given as treatment rather than prophylaxis

- Perforated abdominal viscus (eg, ruptured appendix)
- Compound fracture
- Laceration due to an animal or human bite> 12h after injury
- Occurrence a major break in a sterile technique

Timing of administration of prophylactic agents

- Administration of antimicrobial agents 1 or 2 hours before surgery decrease the risk of wound infection
- The agents require longer administration times such as glycopeptides or fluoroquinolones administration should begin within 120 minutes prior to surgery
- A single dose of an antimicrobial agent is sufficient



Timing of administration of prophylactic agents

- Duration of prophylaxis after any procedure should not exceed 24h.

Intraoperative dosing is required:

- if duration of the procedure is greater than 2 times the half life of the drug or if there is excessive blood loss(>1500cc in adult)

- Postoperative dose after closure generally are not recommended in clean and clean contaminated procedure, even in the presence of a drain

Preoperative screening and decolonization

- Use of preoperative **nasal mupirocin** and **chlorhexidine bath** for S aureus carriers reduce the risk of deep SSI and is recommended in **cardiac** and **orthopedic** surgery.

Recommended antimicrobial agents

Antimicrobial prophylaxis for most surgical procedures including gastric, biliary, thoracic(non cardiac), vascular, neurosurgical, orthopedic

First generation of cephalosporin: cefazolin

If risk for MRSA is high: vancomycin

Operatoin	Likely pathogens	Recommended drugs	Preoperative dose
Esophageal and gastrodeodenal	Enteric gram-negative bacilli, gram positive cocci	Cefazolin	30mg/kg
Biliary tract	Enteric gram-negative bacilli, gram positive cocci,enterococci	Cefazolin	
Colorectal or appendectomy(non perforated)	Enteric gram-negative bacilli, gram positive cocci,enterococci, anaerobs	Cefazolin+ Metronidazole Metronidazole+ gentamicin	Metronidazole:15mg/kg Gentamicin:2/5mg/kg
Head & neck sergury (incision through oral or pharyngeal mucosa)	Anaerobes, enteric gram-negative bacilli, S aureus	Cefazolin+Metronidazole Clindamycin with or without gentamicin Ampicillin-sulbactam	Clindamycin; 10mg/kg Ampi sulbactam: 50mg/kg

Operation	Likely pathogens	Recommended drugs	Preoperative dose
genitourinary	Enteric gram-negative bacilli, enterococci	Cefazolin Or Co- trimoxazole	30mg/kg 4mh/kg trimethoprim 20mg/kg sulfamethoxazole
Neurosurgery (craniotomy, ventriculoperitoneal shunt replacement)	S epidermidis, S aureus	Cefazolin Or Vancomycin(MRSA, MRSE)	30mg/kg 15mg/kg
Ophtalmic	S epidermidis, S aureus, streptococci, enteric gram neg bacilli, pseudomonas species	Gentamicin, ciprofloxacin, ofloxacin, moxifloxacin, tobramycin or Neomycin, gentamicin, polymyxin B or cefazolin	Multiple drops topically 2-24 h before procedure 100mg sub conjunctivally at the end of procedure

operation	Likely pathogens	Recommended drugs	Preoperative dose
orthopedic	S epidermis, S aureus	Cefazolin OR Vancomycin(MRSA, MRSE)	30mg/kg 15mg/kg
Thoracic (non cardiac)	S epidermis, S aureus, streptococci, gram-negative enteric bacilli	Cefazolin OR Vancomycin (MRSA)	30mg/kg 15mg/kg
Traumatic wound	Skin: S aureus, group A streptococci, S epidermidis Perforated viscus: gram negative enteric bacilli, chlostridum species	Cefazolin Cefoxitin with or without gentamicin OR Gentamicin+ Mertonidazole+ Ampicillin OR Ertapenem	30 mg/kg 40mg/kg 2.5mg/kg 2.5mg/kg 10mg/kg+ 50mg/kg 15 mg/kg


The end