

TRAINING OF CORE TRAINERS

CPG

Antibiotic Prophylaxis in Oral And Maxillofacial Surgery for Prevention of Surgical Site Infection (3rd Edition)



Lecture 1: INDICATION BY PROCEDURE

Assoc Prof Dr. Syed Nabil bin Syed Omar
Senior Lecturer and Consultant
Oral & Maxillofacial Surgeon
Faculty of Dentistry
Universiti Kebangsaan Malaysia, WPKL

INTRODUCTION

- ▶ Surgical site infections (SSIs) are common complications that surgeons encounter, leading to significant morbidity and mortality.
- ▶ Infections can occur in oral and maxillofacial surgeries, with a prevalence rate of approximately 10%-15%.
- ▶ Antibiotic prophylaxis(AP) may play a pivotal role in mitigating the risk of post-operative infections
- ▶ This revised CPG for antibiotic prophylaxis in oral and maxillofacial surgery represents a conscientious effort to align clinical practices with the latest evidence and global initiatives in antibiotic stewardship

- ▶ This clinical guideline attempts to clarify the need for antibiotics according to the **type of wounds**.
 - Clean surgery
 - Clean contaminated surgery
 - Contaminated surgery

- ▶ There are also certain surgical procedures that will be mentioned specifically due to its complexity and variability
 - Oral and Maxillofacial Trauma
 - Oncological Head and Neck Surgery

LEARNING OBJECTIVES

LEARNING OBJECTIVES

1

- To be able to differentiate type of surgical procedure according to wound classification

2

- To be able to decide the need for antibiotic prophylaxis based complexity of procedures

WOUND CLASSIFICATION IN SURGERY

WOUND CLASSIFICATION

Surgical Wound Classification Grades (I–IV) as Defined by the CDC

CDC Surgical Wound Classification Definitions

Class I/Clean: An uninfected operative wound in which no inflammation is encountered, and the respiratory, alimentary, genital, or uninfected urinary tract is not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. Operative incisional wounds that follow no penetrating (blunt) trauma should be included in this category if they meet the criteria.

Class II/Clean-Contaminated: An operative wound in which the respiratory, alimentary, genital, or urinary tracts are entered under controlled conditions and without unusual contamination. Specifically, operations involving the biliary tract, appendix, vagina, and oropharynx are included in this category, provided no evidence of infection or major break in a sterile technique is encountered.

Class III/Contaminated: Open, fresh, accidental wounds. In addition, operations with major breaks in a sterile technique (eg, open cardiac massage) or gross spillage from the gastrointestinal tract, and incisions in which acute or no purulent inflammation is encountered are included in this category.

Class IV/Dirty-Infected: Old traumatic wounds with retained devitalized tissue and those that involve existing clinical infection or perforated viscera. This definition suggests that the organisms causing postoperative infection were present in the operative field before the operation.

CDC = Centers for Disease Control and Prevention.

Source: Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR. Guideline for Prevention of Surgical Site Infection, 1999. Centers for Disease Control and Prevention (CDC) Hospital Infection Control Practices Advisory Committee. Am J Infect Control. 1999 Apr;27(2):97-132; quiz 133-4; discussion 96. PMID: 10196487.

WOUND CLASSIFICATION

1. Clean Surgery
2. Clean contaminated Surgery
3. Contaminated surgery
4. Surgery with wide range of surgical wound types
 - ▶ Oral and maxillofacial trauma
 - ▶ Oncology head and neck surgery

CLEAN SURGERY

CLEAN SURGERY

- ▶ When an uninfected operative wound in which no inflammation is encountered, and the respiratory, alimentary, genital, or uninfected urinary tract is not entered. In addition, clean wounds are primarily closed and, if necessary, drained with closed drainage. (Mangram et al., 1999)
- ▶ Where the incision and exposure does not breach into the oral cavity.
 1. Submandibular or parotid gland surgery
 2. Temporal (Gillies) zygomatic fracture reduction
 3. Temporomandibular surgery



CLEAN SURGERY

- ▶ All included studies in this CPG found no significant in reduction of SSI in clean surgery for head and neck region but may be considered for neck dissection (Ariyan et al., 2015); Shkedy et al., 2018; Chiesa-Estomba et al., 2019)

Key Message 1

The CPG DG suggest that AP in clean head and neck surgeries to prevent SSIs can be considered in the following situations:

- **patient related factor**
 - Immunocompromised conditions
- **surgery related factor**
 - Neck dissection
 - Use of bone or tissue grafting
 - Use of implants
 - Long duration of surgery

Recommendation 1

- Antibiotic prophylaxis should not be given for healthy patients undergoing clean head and neck surgery.

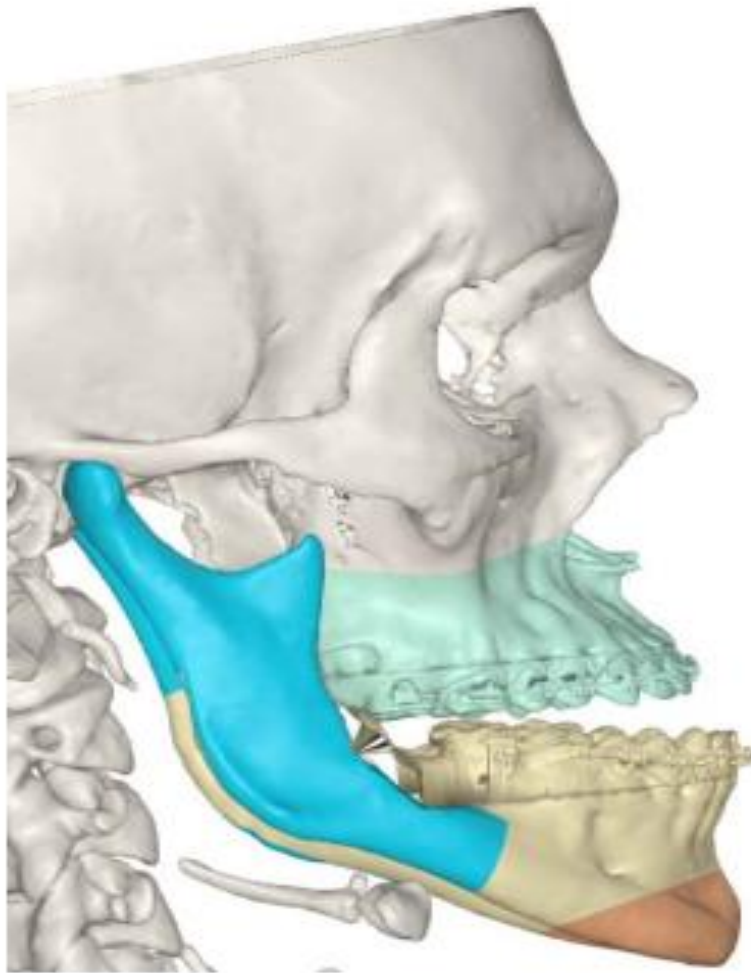
CLEAN-CONTAMINATED SURGERY

CLEAN-CONTAMINATED SURGERY

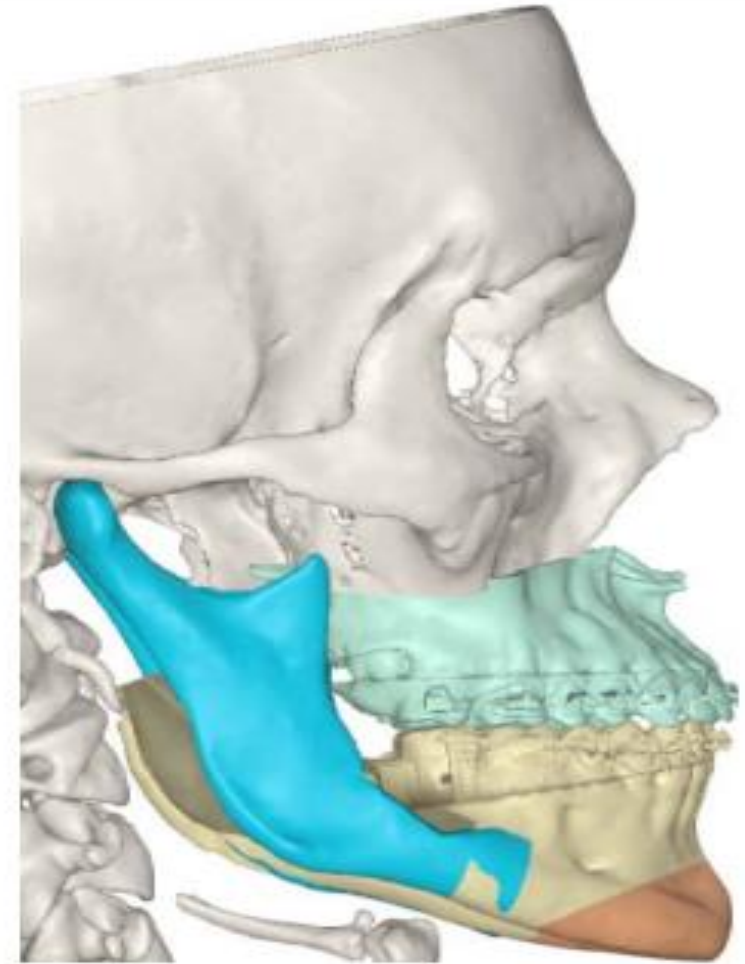
- ▶ An incision through which the respiratory, alimentary or genitourinary tract is entered under controlled conditions but with no contamination encountered.

- ▶ Procedures in clean-contaminated surgery
 - a) Impacted tooth surgery
 - b) Periodontal Surgery
 - c) Dental Implant Surgery
 - d) Intraoral Bone Grafting
 - e) Cleft lip and palate surgery
 - f) Orthognathic surgery

pre-op vs. plan (bone)



pre-op



plan

CLEAN-CONTAMINATED

a) Impacted Tooth Surgery

- ▶ The use of AP in third molar removal surgery may reduce the risk of infection but should be weighed against the risk of adverse effects.
Decision for antibiotics administration must be made in case to case basis.
(Singh Gill et al., 2018; Menon et al., 2019; Lodi et al., 2021; Camps-Font et al., 2024),

Key Message 2

Indications for AP in removal of impacted tooth to prevent SSIs are:

- **Patient's risk factor and medical history**
 - Immunocompromised conditions
 - Smoking status
- **Complexity of the surgical procedure**
 - Significant bone removal
 - Prolonged operation time >1 hour

Recommendation 2

- Antibiotic prophylaxis may be administered in impacted tooth surgery when it is indicated*.
 - The preferred option is Amoxicillin or Amoxicillin-clavulanate.

*Refer to Key Message 2 above

CLEAN-CONTAMINATED

b) Periodontal Surgery

- ▶ There is lack of evidence in regards to antibiotics for periodontal surgical procedures especially most of these procedures employed the use of bone grafts and membranes. Noting the implication of having infection meant these biomaterial will be lost, the DG members opine that AP should be given for such procedure.

Recommendation 3

- Antibiotic prophylaxis should be given for periodontal surgical procedures involving placement of biomaterials.

CLEAN-CONTAMINATED

c) Dental Implant Surgery

- ▶ Bacterial driven infections, both clinical and subclinical, is one of the causes of implant failures and AP has been advocated as a means of prevention. Based on the evidences reviewed by DG members, the use of AP in dental implant surgery may reduce the risk of implant failure. (Rodríguez Sánchez et al., 2018; Romandini et al., 2019; Momand et al., 2022; Payer et al., 2020)

Key Message 3

Indications for AP in dental implant surgery to prevent SSIs are:

- **Patient's risk factor and medical history**
 - Immunocompromised conditions
 - Smoking status
- **Complexity of the surgical procedure**
 - Prolonged operation time > 1 hour
 - Simultaneous hard/ soft tissue grafting

Recommendation 4

- Antibiotic prophylaxis should be administered in dental implant surgery.
 - The preferred option is Amoxicillin.

CLEAN-CONTAMINATED

d) Intraoral Bone grafting

- ▶ There is not enough evidence to decide if antibiotic use is necessary during intraoral bone graft procedures. This lack of evidence is likely because surgeons prioritize patient safety and consider the financial cost and morbidity too great if a bone graft is lost through infection. Individual case considerations in needed.

Key Message 4

Indications for AP in intraoral bone grafting to prevent SSIS are:

- **Patient related factor**
 - Immunocompromised conditions
 - Smoking status
- **Surgery related factor**
 - Prolonged operation time >1 hour
 - Simultaneous hard/soft tissue grafting

Recommendation 5

- Antibiotic prophylaxis may be administered in intraoral bone grafting.

CLEAN-CONTAMINATED

e) Cleft Lip & Palate Surgery

- ▶ In cleft lip & palate surgeries, post-operative wound infection is a recognized complication that may lead to breakdown of the wound in the need for further surgical intervention. Surgeries examples include cheiloplasty , palatoplasty and alveolar bone grafting.
- ▶ High quality evidence is lacking but local practices has been to administer antibiotics for such surgeries

Recommendation 6

- Antibiotic prophylaxis for cleft lip and palate surgery:
 - should be administered pre-operatively
 - may be considered for post-operatively up to five days

CLEAN-CONTAMINATED

f) Orthognathic Surgery

- ▶ Orthognathic surgery involve use of implants that are exposed to the oral, nasal cavity and maxillary sinuses. Being a major surgery, antibiotics is recommended to be prescribed. Evidence reviewed in this CPG that assess the period of antibiotics prescription favors prescription of more than 1 day post-operatively. Brignardello-Petersen et al., 2015; Davis et al., 2017; Gil et al., 2021

Recommendation 7

- Antibiotic prophylaxis for orthognathic surgery:
 - should be administered pre-operatively
 - may be considered for post-operatively up to five days

CONTAMINATED SURGERY

CONTAMINATED SURGERY

- ▶ An incision undertaken during an operation in which there is a major break in sterile technique or gross spillage from the gastrointestinal tract, or an incision in which acute, non-purulent inflammation is encountered. Open traumatic wounds that are more than 12–24 hours old also fall into this category.
- ▶ These wounds may result from various sources such as trauma or bite wounds
- ▶ The CPG members opines that the use of AP is crucial to minimize the risk of infections. This aligned with the National Antimicrobial Guideline (NAG) that recommends Amoxicillin-clavulanate 625mg for five days for bite wounds.(NAG, 2024)



CONTAMINATED SURGERY

Key Message 5

Indications for AP in contaminated wounds to prevent SSIs are:

- **Wound characteristics**
 - bites
 - extensive through and through lacerations
 - crush injuries
 - gross contamination
 - penetrating injuries (ballistics, stab wounds)
- **Patient related factors**
 - diabetes
 - immunosuppression
 - steroids
 - extremes of age
 - obesity

Recommendation 8

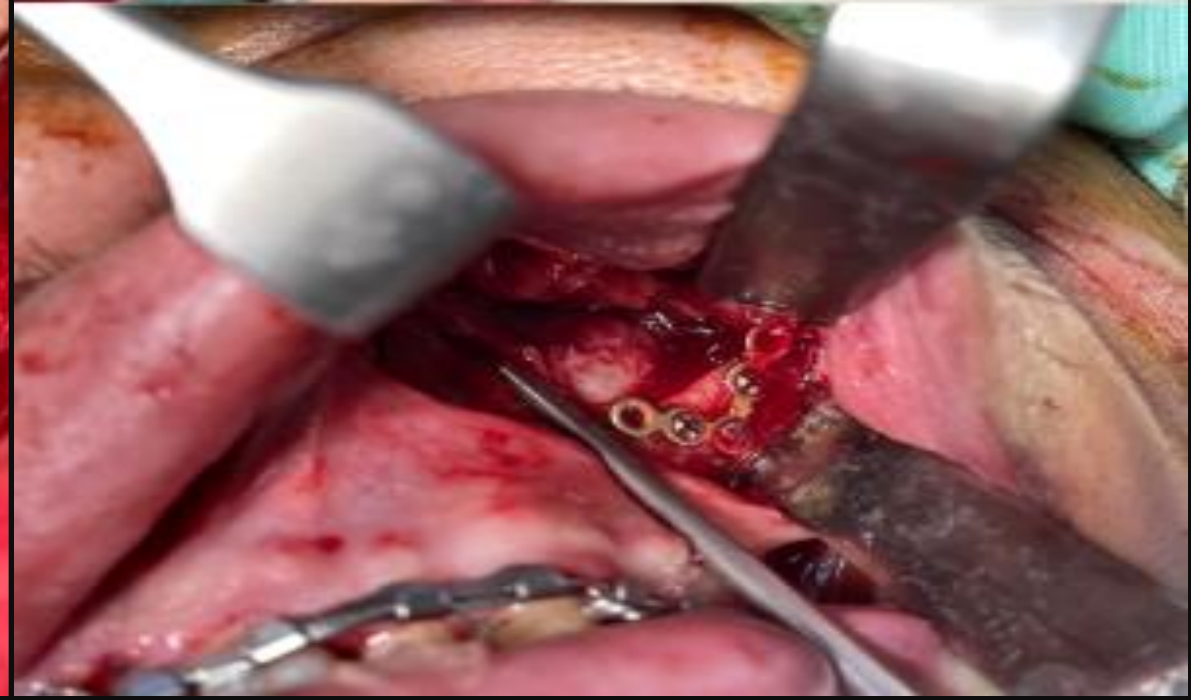
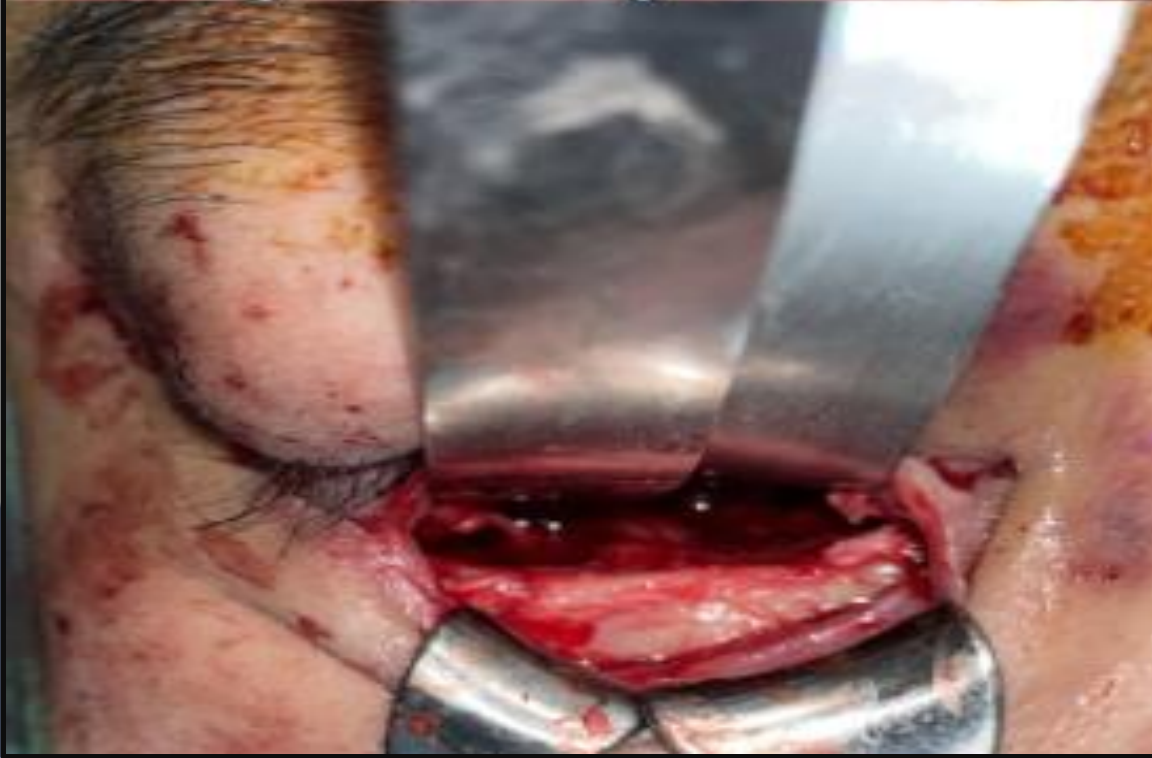
- Antibiotic should be administered in contaminated wounds in oral and maxillofacial region.
- Antibiotic should be administered in bite wounds in oral and maxillofacial region.
 - The preferred option Amoxicillin-clavulanate.
 - Should be provided post-operatively up to five days.

ORAL AND MAXILLOFACIAL TRAUMA

ORAL AND MAXILLOFACIAL TRAUMA

- ▶ Oral and maxillofacial (OMF) trauma surgery encompasses both clean (fractures not involving oral cavity), and clean-contaminated surgeries (fractures involving oral cavity). It also in most cases involves the use of implants (plates and screws).
- ▶ This necessitates a special topic on antibiotics prophylaxis in such cases.
- ▶ Most of the reviewed evidence in the CPG noted that antibiotics prophylaxis is prescribed for OMF trauma with the comparison is mainly on the period of administration.

(Dawoud et al., 2021; Delaplain et al., 2020; Oppelaar et al., 2019; Habib et al., 2019; Shridharani et al., 2015; Gaal et al., 2016; Goormans et al., 2022; Forrester et al., 2021; Erstad et al., 2022)



ORAL AND MAXILLOFACIAL TRAUMA

- ▶ Prolonged AP in oral and maxillofacial trauma surgery may be considered in cases involving complex or contaminated surgery, but must be weighed against the risks of developing antibiotic-resistant infections and other adverse effects.

Key Message 6

Indications for post-operative AP >24 hours in oral and maxillofacial trauma surgery to prevent SSIs are:

- **Patient related factor**
 - Immunocompromised conditions
 - Smoking status
 - Polytrauma
- **Surgery related factor**
 - Complex fracture and bone loss
 - Soft tissue loss at the surgical site/ insufficient soft tissue closure
 - Wound breakdown
 - Presence of contaminants
 - Presence of foreign bodies

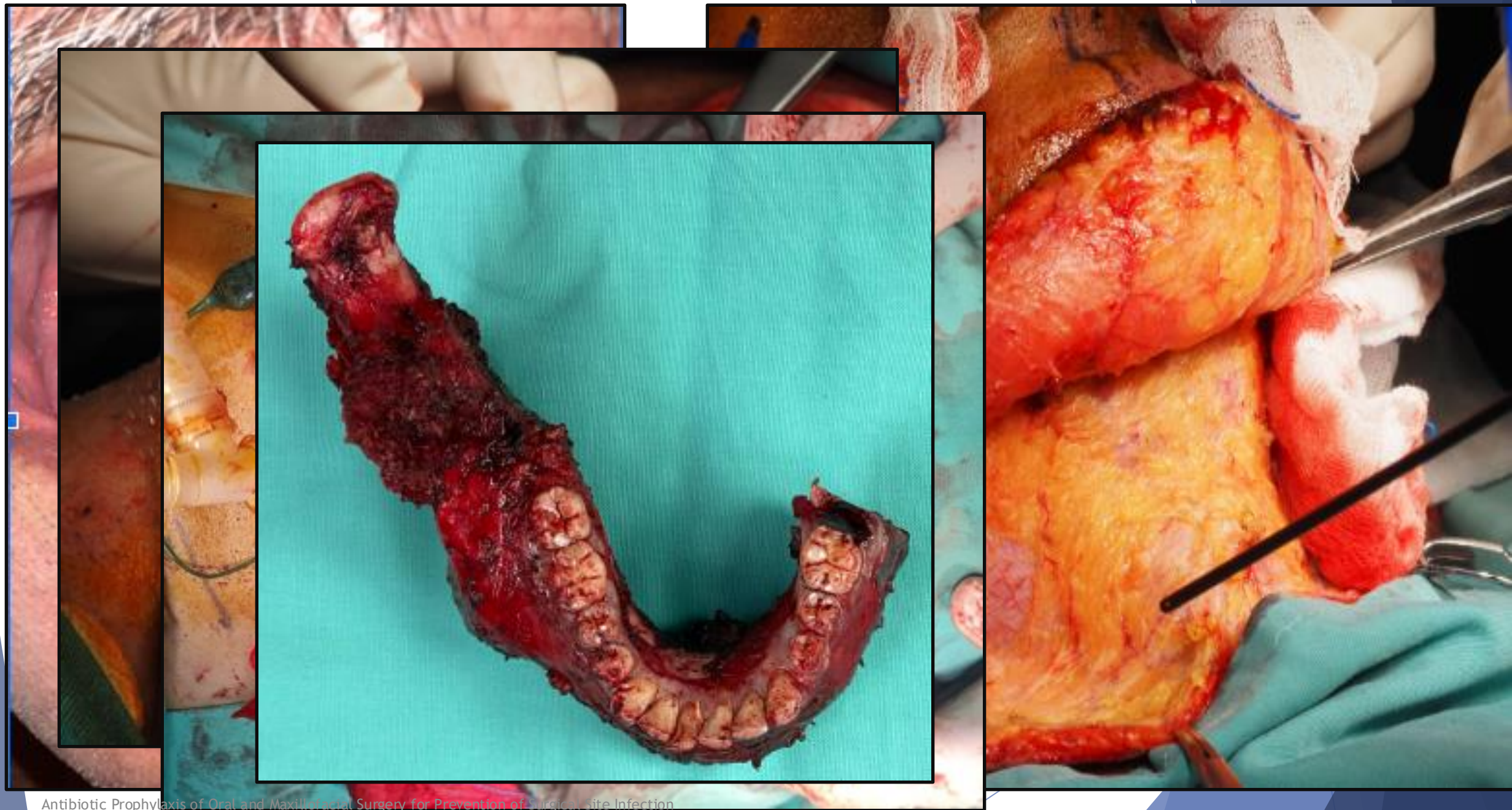
Recommendation 9

- For oral and maxillofacial trauma surgery, peri-operative antibiotics should be given to prevent surgical site infection but not more than 24 hours post-operatively.

ONCOLOGY HEAD AND NECK SURGERY

ONCOLOGY HEAD AND NECK SURGERY

- ▶ Oncological head and neck surgical procedure involves operation which requires the removal of benign as well as malignant lesions or tumours.
- ▶ Surgical procedures performed can range from simple removal of small lesion with or without local flap closure to complex major tumour resections, neck dissection and reconstruction with loco-regional or free flap.



ONCOLOGY HEAD AND NECK SURGERY

- ▶ Evidence reviewed in this CPG found reduction in SSI with the use of AP.^(ElHawary et al., 2021; Blatt and Al-Nawas, 2019)
- ▶ There was a mixed results when AP the timing and duration of administration was assessed.^(Vila et al., 2017; Bartella et al., 2017)
- ▶ The post-operative recovery of the patient should determined the duration of post-operative antibiotic.

Recommendation 10

- Antibiotic prophylaxis should be prescribed in oncological head and neck surgery.



THANK YOU

Antibiotic Prophylaxis in Oral and Maxillofacial Surgery for Prevention of Surgical Site Infection (3rd Edition)

ANTIBIOTIC PROPHYLAXIS
ORAL AND MAXILLOFACIAL SURGERY