

TRAINING of CORE TRAINERS CPG

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



CASE DISCUSSION 2

Clean contaminated surgery

Scenario

01



Name
Mr. KS Lee



Age
36



Gender
Male



Nationality
Malaysian



Medical history
NKMI

▶ Case history

- Referred for removal of impacted wisdom teeth.

▶ HPC

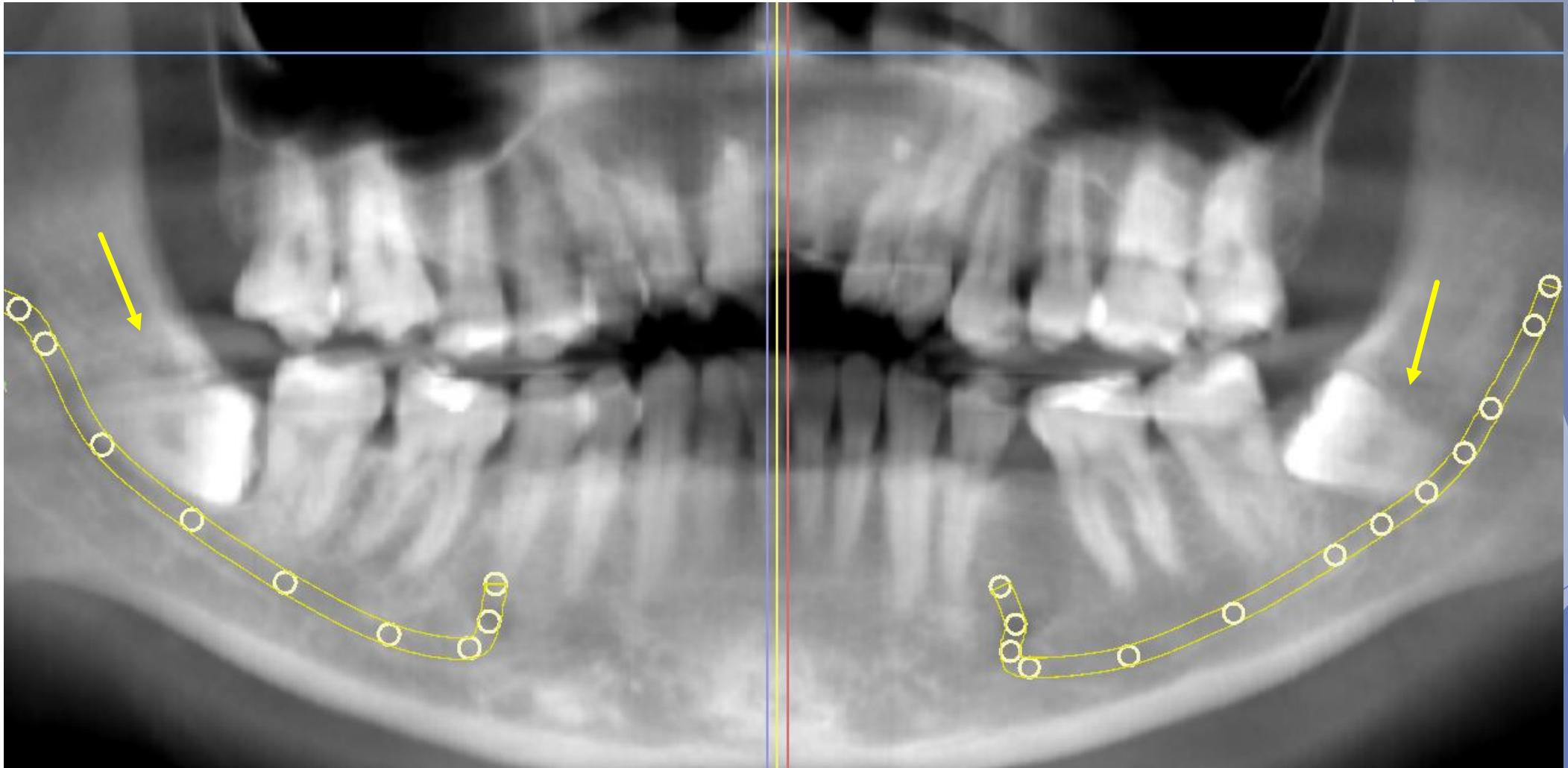
- Recurring pain and swelling at distal to both left and right last molars.

▶ Clinical examination :

- 8mm periodontal pockets at distal of 37 and 47 with bleeding on probing
- Currently asymptomatic

▶ Radiographic examination :

- Deep mesioangular impaction of 38
- Deep horizontal impaction of 48



Mr. KS Lee's OPG

Question 1



What are the **key indications** for antibiotic prophylaxis in removal of impacted tooth to prevent SSIs ?



Answer 1

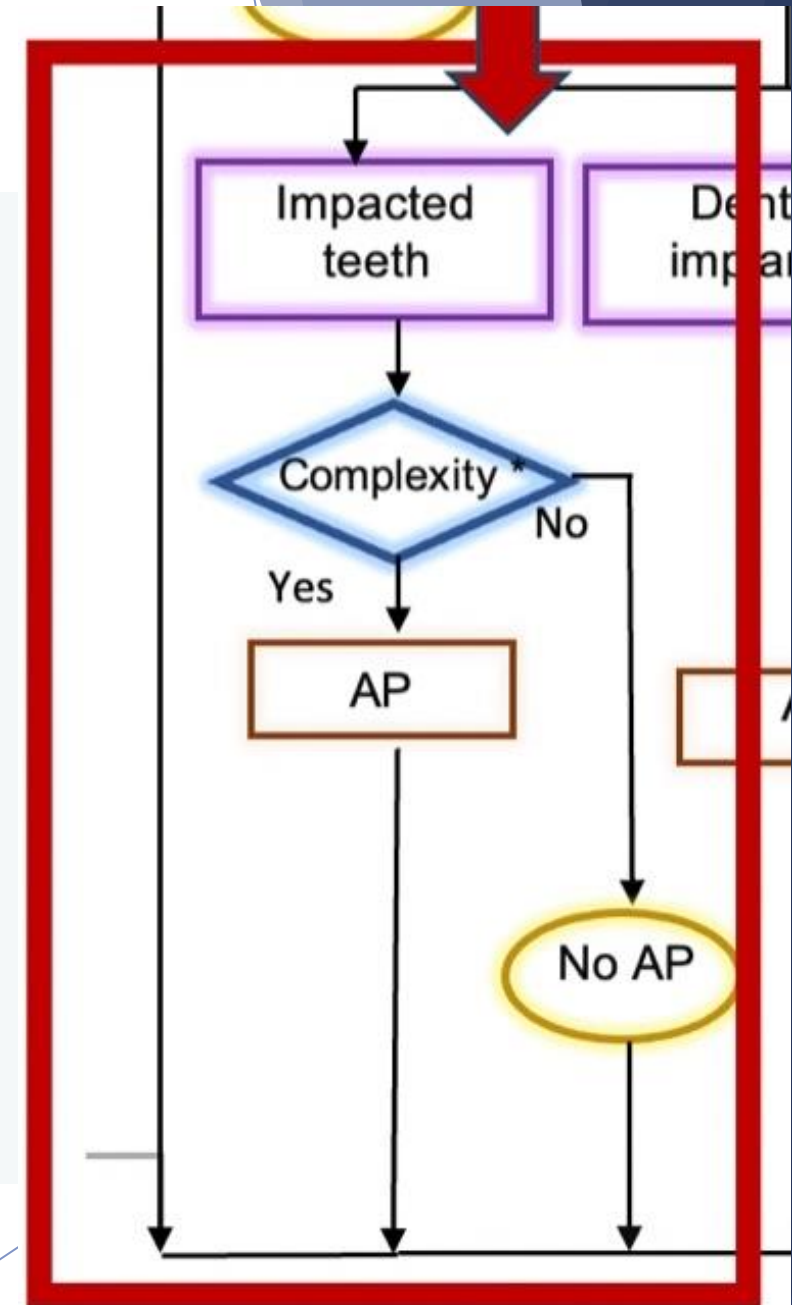


Indications for antibiotic prophylaxis in removal of impacted tooth to prevent SSIs are:

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



Question 2



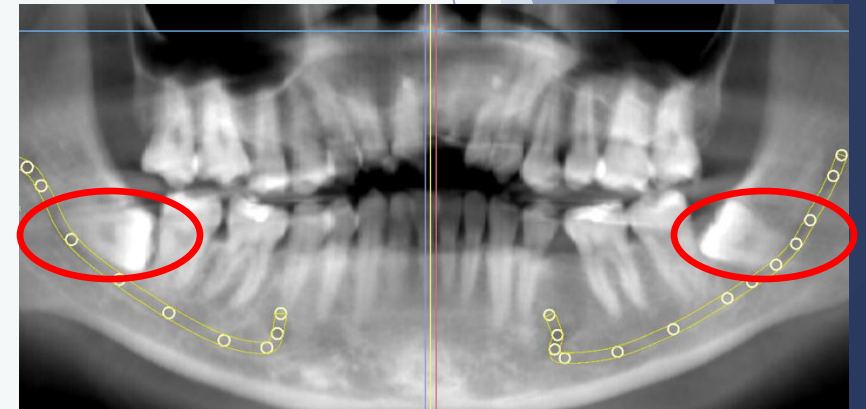
So, is antibiotic prophylaxis indicated for this patient?



Answer 2



- ▶ **Yes**, antibiotic prophylaxis **may be administered** for this patient.
- ▶ Reason :
 - Deep mesioangular impaction of 38 and deep horizontal impaction of 48



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

Question 3



What is the **preferred antibiotic and dosage** for this patient?

Answer 3



Preferred option is **Amoxicillin or Amoxicillin-clavulanate.**
Dosage : 1-2g PO Amoxicillin or
1.25g PO/ IV 1.2g Amoxicillin-clavulanate

Recommendation 2

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

Dosing of Commonly Prescribed Prophylactic Antibiotics (No Penicillin Allergy)

Antibiotics	Dosage		Possible AE : Common	Possible AE : Caution
	Adult	Pediatric		
Amoxicillin	1-2*g PO (2g is the recommended dosage in high risk patient developing IE)	50 mg/kg PO	Gastrointestinal effects: Diarrhoea, nausea, vomiting	Hypersensitivity reactions including anaphylaxis, anaphylactoid and severe cutaneous adverse reactions
Amoxicillin-clavulanate	1.2g IV (IV bolus: Administer over 3 – 4 minutes) OR 1.25 g PO	30 mg/kg IV (maximum 1.2g)	Gastrointestinal disorders: Diarrhoea, Nausea, vomiting, indigestion Immune system disorders: urticaria Nervous system disorders: Headache, dizziness, reversible hyperactivity.	Convulsions (at high doses or in patients with renal impairment) Skin and subcutaneous tissue disorders Severe hypersensitivity reactions

Question 4



When do you administer the antibiotic?
(Timing)

Answer 4



30-60minutes before the minor oral surgery (MOS)

Recommendation 18

- Antibiotic prophylaxis should be given 30-60 minutes prior to surgical incision or within 120 minutes for Fluoroquinolones and Vancomycin.

Routine post-op antibiotics are discouraged unless clinically indicated..

What if.....

In a MOS case where prophylactic antibiotic was not planned to be given pre-operatively, and the procedure becomes prolonged (>1 hour):

Question : What should the antibiotic dosage be in such a scenario?

Answer : Post-operative antibiotics alone are considered treatment, not prophylaxis, as they are given after bacterial contamination has likely occurred.

Prophylaxis aims to establish effective antibiotic levels before tissue contamination.

The CPG underlines the **importance of planning** prophylactic antibiotic use **before surgery**, especially for cases anticipated to exceed 1 hour or involve significant bone removal.

Intra-operative and post-operative antibiotic decisions remain at the operator's clinical discretion, guided by intra-op risk assessment and procedural factors.

Scenario

02



Name
Mrs. Y



Age
67



Gender
Female



Nationality
Malaysian



Marital status
Married



Occupation
Retired

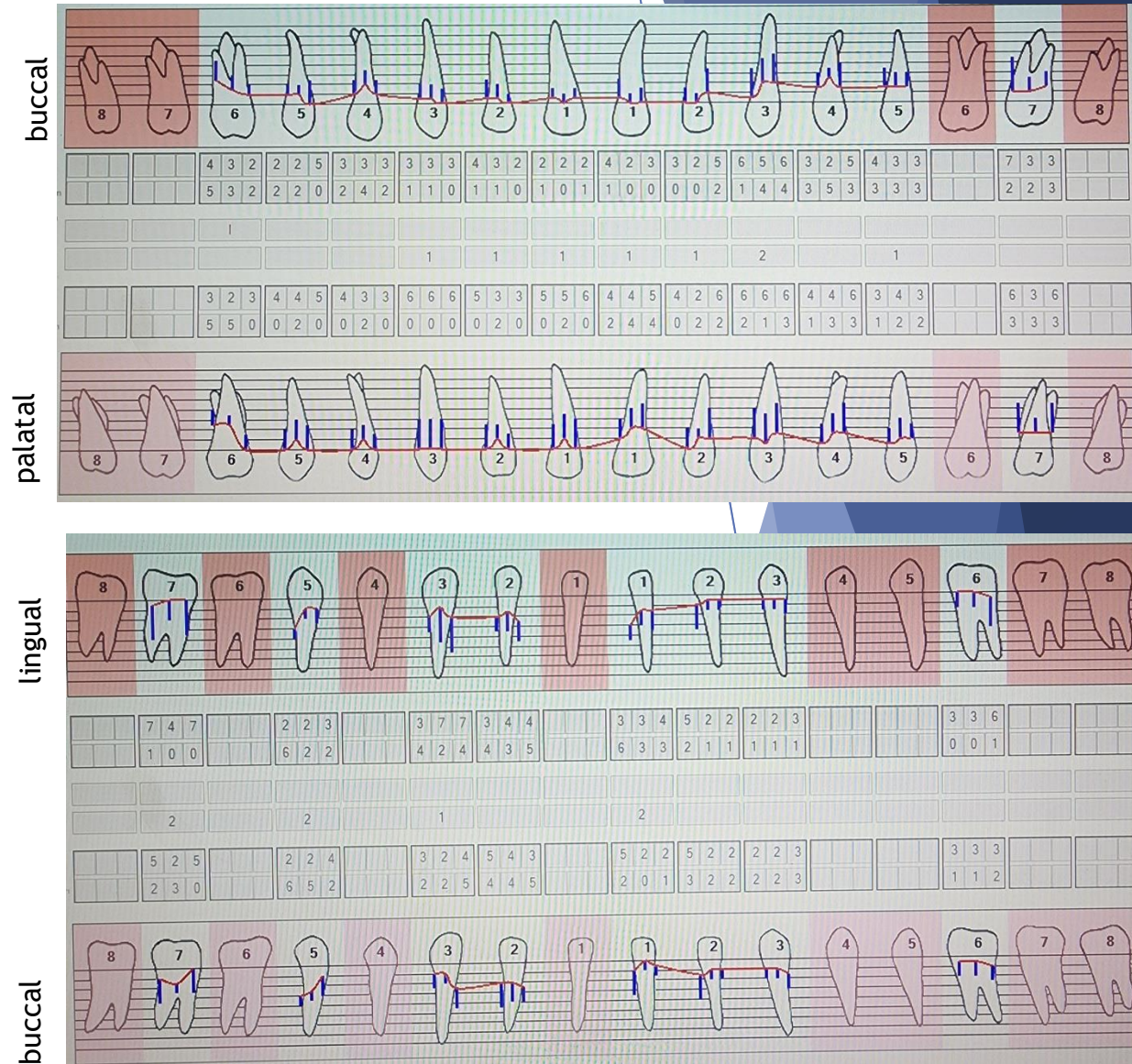
Referred for management of Periodontal disease

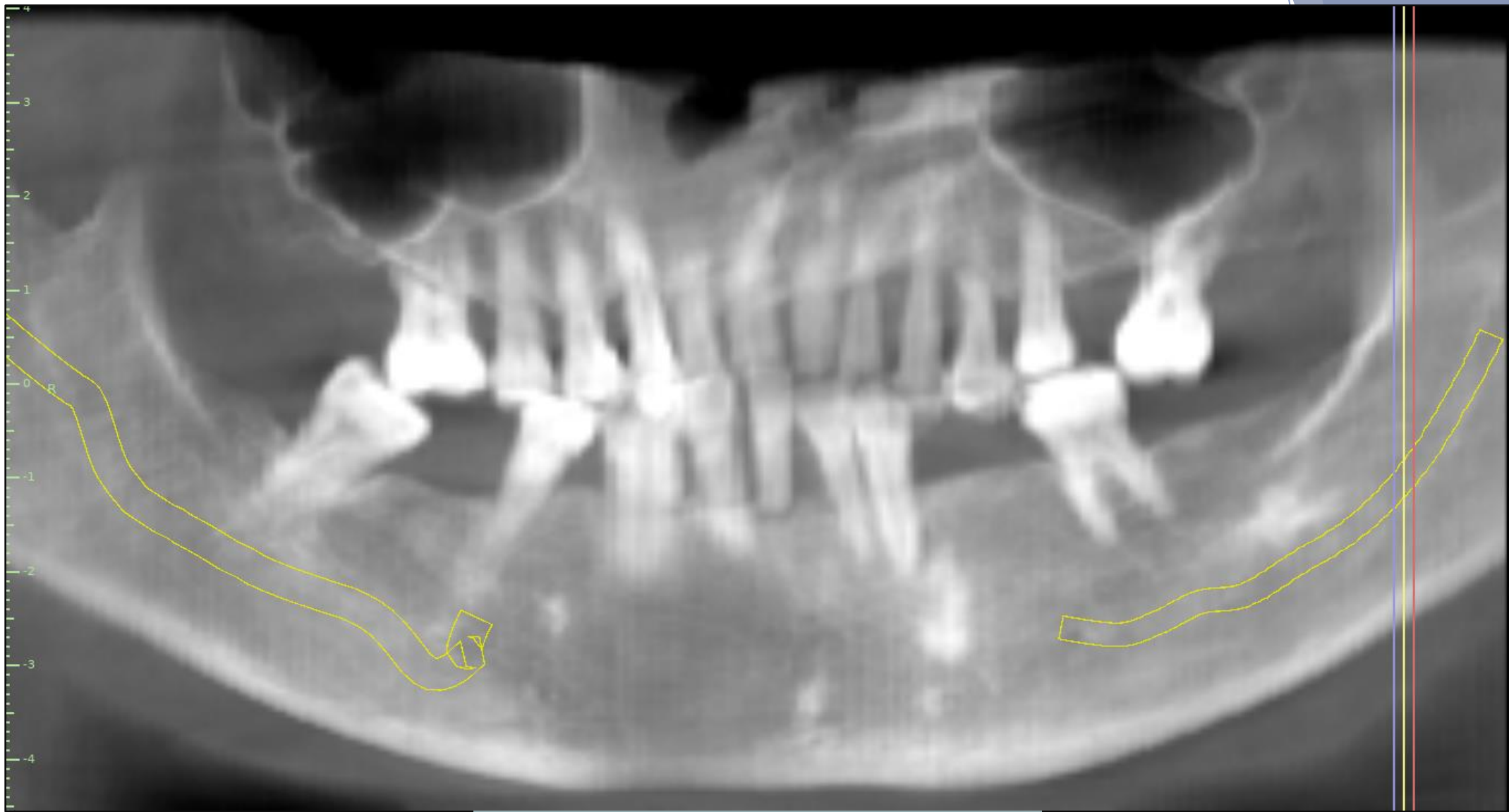
► **Chief complaint :**

- Increasing **mobility** of upper central incisors. Patient has been aware of mobility and **increased spacing** of upper incisors for several years.
- Had lower incisor **extracted** due to excessive mobility in 2019. Patient is keen to replace missing teeth with **implant supported crowns**.

Case History & Examination

- ▶ **Clinical examination :**
 - Multiple missing teeth
 - Multiple periodontal **pockets >5mm** with bleeding on probing
- ▶ **PMH :**
 - None of relevance
 - Nil Allergies
- ▶ **Non-smoker**
- ▶ **Diagnosis :**
Generalized Periodontitis Stage 4 Grade C





Mrs. Y's OPG

Upon successful completion on initial cause related therapy, the patient was left with :

- ❖ Good oral hygiene
- ❖ Residual deep pocket on tooth 23 associated with an angular intrabony defect
- ❖ Poor prognosis tooth 31
- ❖ Missing teeth 17, 26, 35, 34, 37, 41, 44 and 46

SURGICAL TREATMENT PLAN

The following surgical procedures were presented and discussed with the patient :

1. Guided Tissue Regeneration for tooth 23
2. Immediate implant fixture placement for tooth 31 and simultaneous alveolar ridge augmentation
3. Implant fixtures at site 46 (single crown) and 35 (2 unit cantilever bridge)

Question 1



Which category does the procedures planned for this patient fall under?



Answer 1



Clean-contaminated surgery

- Clean surgeries performed in inherently contaminated environments.

Question 2



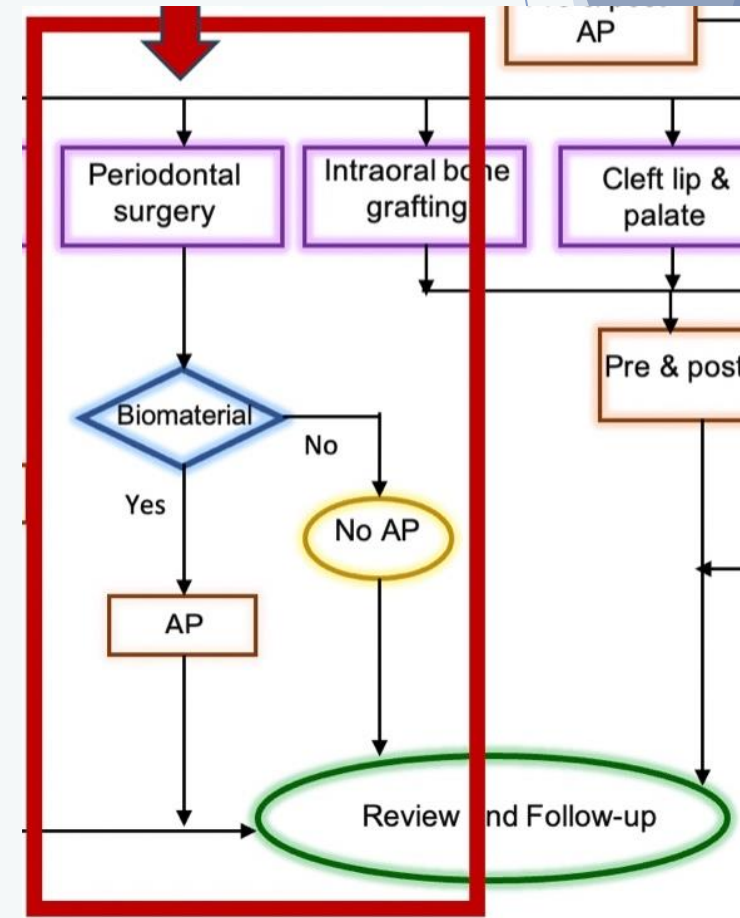
Is antibiotic prophylaxis indicated for periodontal surgery?



Answer 2



- Generally, antibiotic prophylaxis is **not indicated for periodontal surgeries**.
- **However**, when involving **the use of biomaterials** in periodontal surgery, **antibiotic prophylaxis should be given**.
- Patient's safety is prioritised, and the financial cost and morbidity is considered too great if the biomaterial is lost through infection

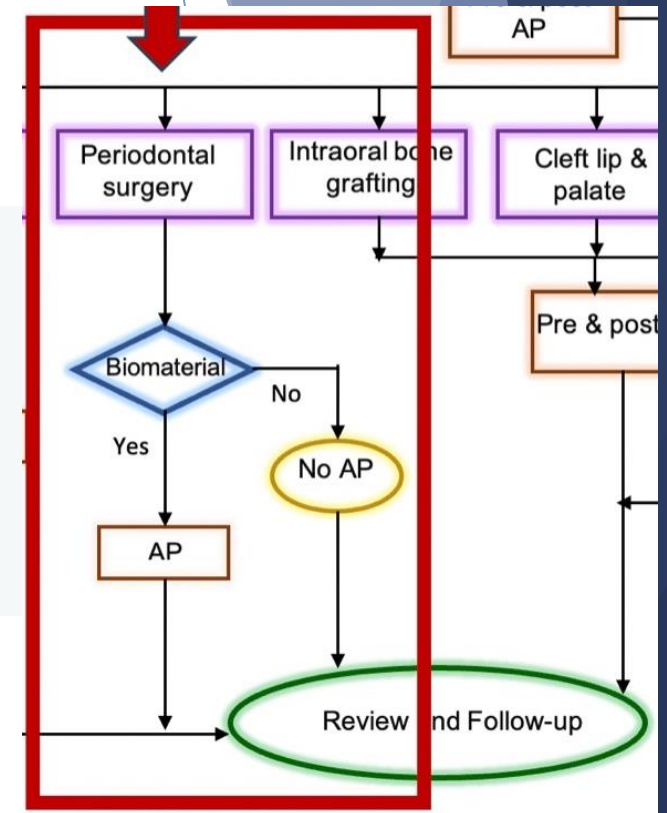


Answer 2



Recommendation 3

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



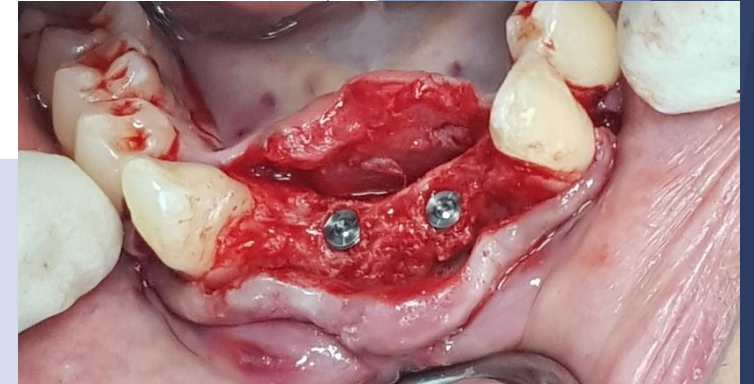
Question 3



This patient now has a history of periodontal disease and she is otherwise systemically healthy.



Does she require antibiotic prophylaxis for dental implant fixture placement surgery (with or without bone grafting) ?





Answer 3

Yes, antibiotic prophylaxis is **indicated for dental implant placement** surgery. This includes surgeries involving just implant fixture placement or with concurrent bone grafting.

- ▶ Based on available evidence, the use of antibiotic prophylaxis in dental implant surgery **may reduce the risk of implant failure.**

Question 4



What would be the preferred antibiotic for this particular patient's prophylaxis regimen?





Answer 4

Recommendation 4

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

❖ Cefazolin, Azithromycin or Doxycycline may be prescribed in cases of Penicillin allergy.

Question 5



If the patient was undergoing alveolar ridge augmentation surgery prior to implant placement, would she benefit from antibiotic prophylaxis?



Answer 5



- ❖ **Yes**, antibiotic prophylaxis **may be administered** in intraoral bone grafting.
- ❖ Patient safety, financial cost and morbidity is considered too great if a bone graft is lost through infection

Recommendation 5

- Antibiotic prophylaxis may be administered in intraoral bone grafting.

KEY CONSIDERATIONS

▶ Antibiotic prophylaxis in Clean-Contaminated Surgery can be considered based on :

▶ **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

Scenario

03



Name
Mr. V



Age
28



Gender
Male



Nationality
Malaysian



Marital status
Married



Occupation
Factory
supervisor

Presenting Complaint

- ▶ Involved in a motor vehicle accident (**MVA**) with severe facial trauma, with **multiple abrasion wounds** on the upper and lower limbs.
- ▶ Motorcycle skidded on the road, not wearing helmet.

Past medical history

History of appendicectomy.

Allergy

No known drug/food allergy.

Social History

- ▶ Tobacco use: 1 pack/day for few years
- ▶ Lifestyle: Sedentary, less active activity.
- ▶ Family History: Diabetes and cardiovascular disease.

Clinical Findings

General condition: Alert, GCS full

Vitals:

- ▶ Blood Pressure: 145/92 mmHg
- ▶ Heart Rate: 88 bpm
- ▶ Random Blood Glucose: 6.6 mmol/L

Extraoral Examination

- ▶ Deep & dirty abrasion wound on the facial area.
- ▶ Ecchymosis and tenderness over the left TMJ.
- ▶ Step deformity on the lower incisors with mobility upon mouth closure.
- ▶ Mandibular midline shift to the left with limited mouth opening (<20 mm).

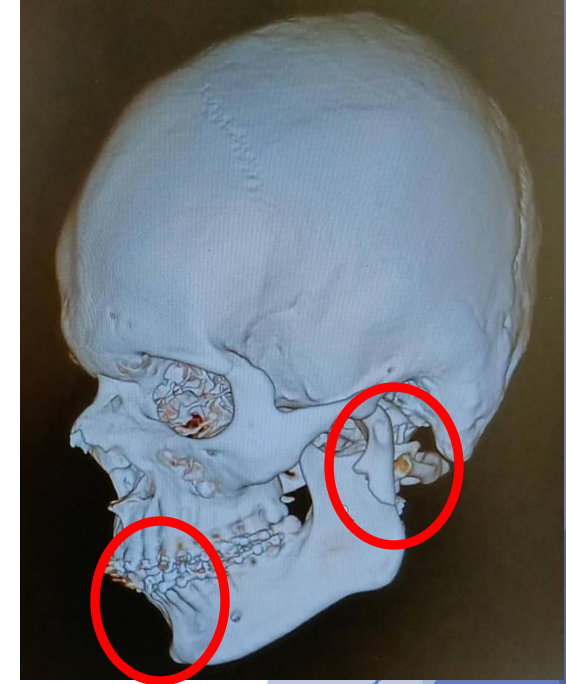
Intraoral Examination

- ▶ Deranged occlusion, with right posterior open bite.
- ▶ Mandible mobile, with step deformity between teeth #31 and #41
- ▶ Sublingual hematoma.



Radiological Findings

- ▶ 3D reconstruction of CT Scan:
 - Left-sided condylar fracture with lateral displacement.
 - Symphysis of mandible fracture.



Question 1



Discuss the wound classification for the injuries sustained by this patient.



Is it a clean wound, clean-contaminated or contaminated wound?

Answer 1



Contaminated wound.
(Deep and dirty abrasion wounds)

If the patient ONLY sustained :

a) Left condylar fracture

→ **clean wound**

b) Symphysis of mandible fracture

→ **clean-contaminated wound**

Question 2



Patient is seen in the A&E.

So, at this point, do you think antibiotic prophylaxis is necessary?

Answer 2



Yes. Antibiotic prophylaxis would be started due to nature of the injury:

- Deep abrasion wound.
- Symphysis fracture with communication into the oral cavity.



Question 3

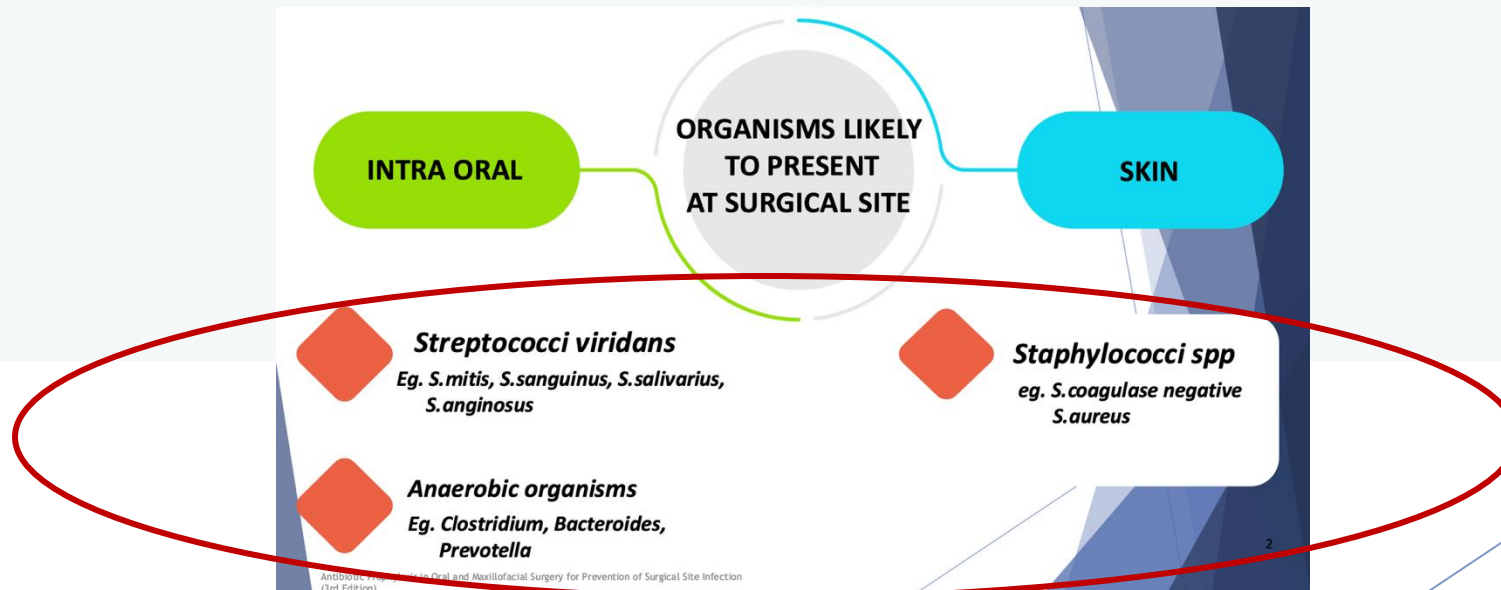
Discuss the antibiotic management for this patient.
What antibiotic regimen is recommended for the patient?



Answer 3



- ▶ Since the patient has sustained **contaminated wound** injuries, a **broad-spectrum antibiotic** should be considered, which covers the organisms from the skin and the oral cavity (eg. amoxicillin-clavulanate, ampicillin-sulbactam, etc.)



Answer 3



- ▶ The dosage and duration of the antibiotic regimen should follow the local clinical setting and clinical judgement.
- Local clinical setting like availability and preferences of the type of antibiotics in the clinic/hospital, etc.
- Clinical judgement such as the severity of the local and systemic condition of the patient, etc.

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.

Answer 3



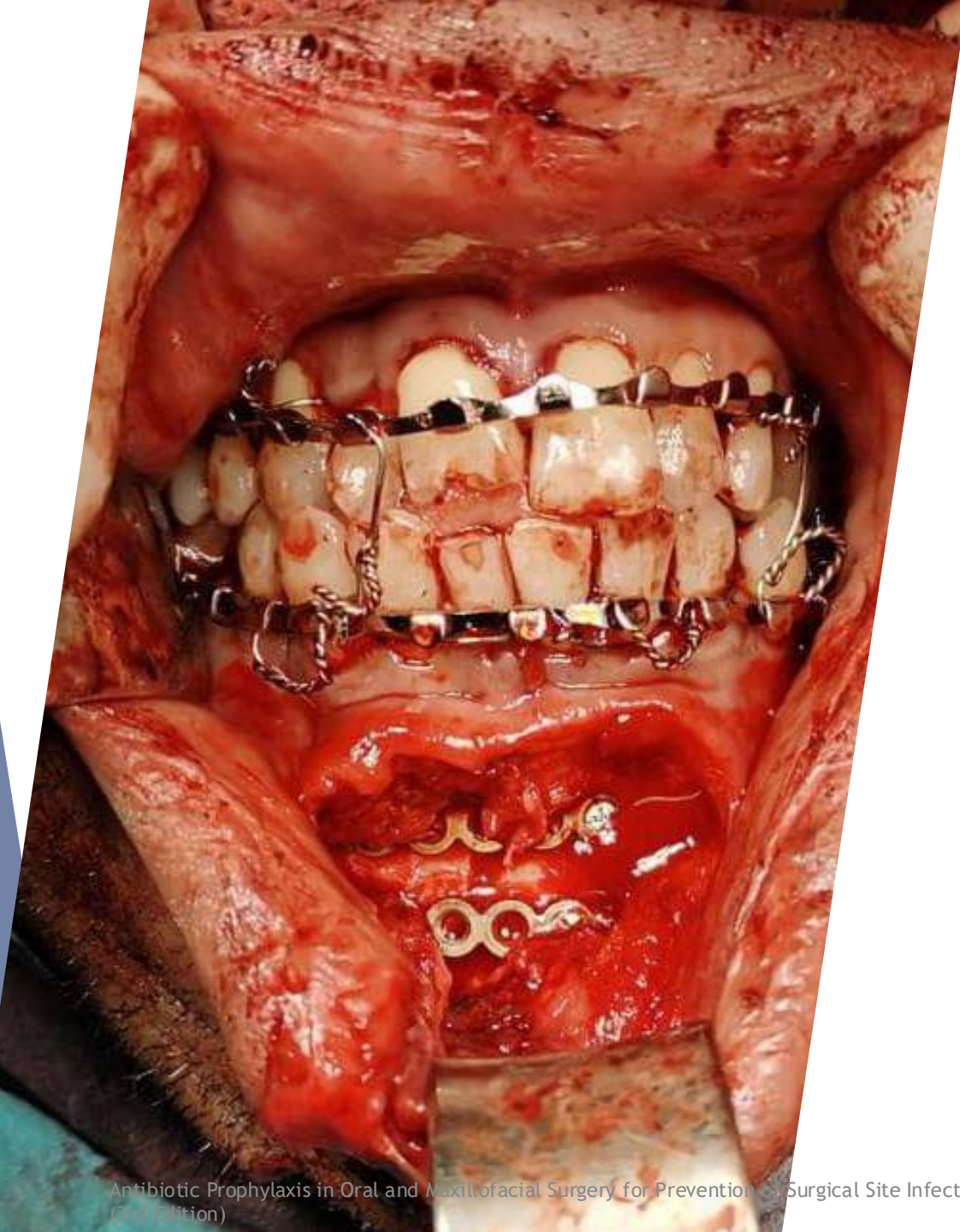
- The common antibiotics available such as:

*IV Amoxycillin- Clavulanate	1.2g	TDS
*IV Ampicillin- Sulbactam	1.5g	TDS (3 times daily)
*IV Cefuroxime + IV Metronidazole	1.5g 500mg	TDS (3 times daily)

Scenario continued

The patient is treated in the ward for a few days and discharged on day three(Day-3)

Patient was scheduled for an operation of the fractures on the mandible in one week's time (Day-10).



Surgical Procedure

Operation planned for
**open reduction and internal
fixation (ORIF)** with miniplates
and screws of the **symphysis and
left condylar fracture of
mandible.**

Question 4



The patient was re-admitted for ORIF.

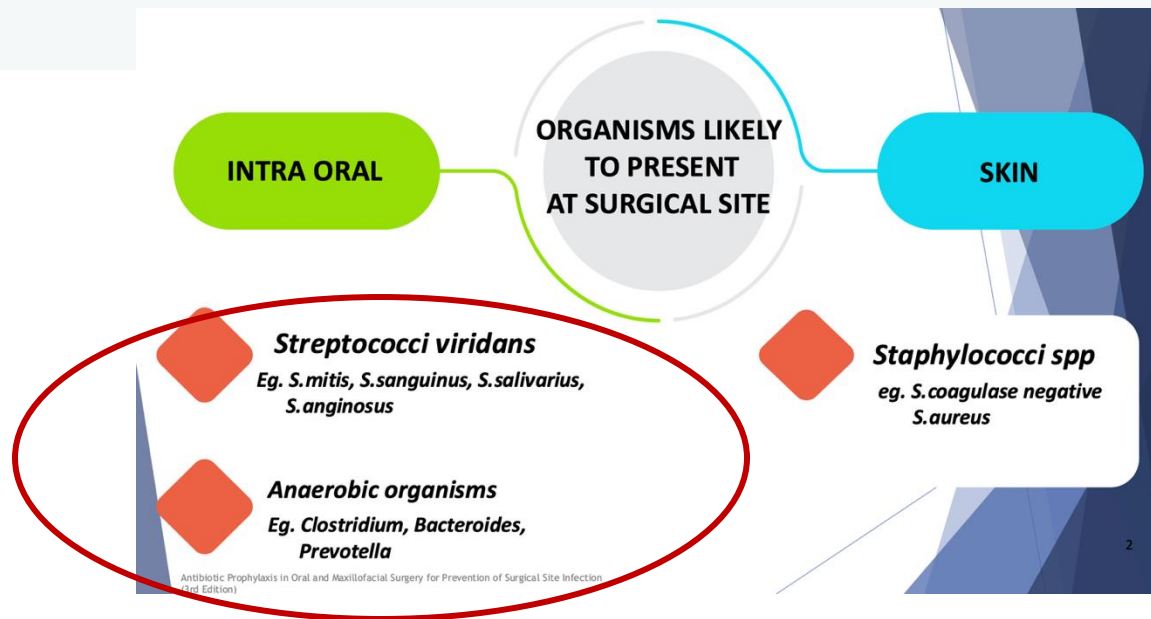


What is the antibiotic regimen for this patient?
Why?

Answer 4



- ▶ Antibiotic prophylaxis should be given for this **clean-contaminated surgery**, which cover the normal commensal organisms of the oral cavity. *(red circle)*



Answer 4



- Intra-oral bacteria (*red circle*) and its correspondence antibiotic of choice (*see the antibiotic columns which are effective against the intra-oral bacteria*).

Table 5: Antibiotics Spectrum

ANTIBIOTIC CLASS	GRAM POSITIVE COCCI			ANAEROBES		GRAM NEGATIVE	
	Methicillin Sensitive Staphylococcus aureus (MSSA)	Methicillin Sensitive Staphylococci spp	Streptococcus	Clostridium	Bacteroides	E.coli	Klebsiella spp
PENICILLINS			Penicillin				
	Cloxacillin						
			Amoxicillin				
			Ampicillin				
	Amoxicillin-clavulanate						
	Ampicillin-sulbactam						
LINCOSAMIDE	Clindamycin						
IMIDAZOLE				Metronidazole			
CEPHALOSPHORIN	Cefazolin					Cefazolin	
	Cefuroxime					Cefuroxime	
MACROLIDES	Azithromycin						
TETRACYCLINE	Doxycycline						

Answer 4



► Common antibiotics used:

1.	Pre-op	IV Amoxycillin-Clavulanate	1.2g stat	Once
2.	Pre-op	IV Ampicillin-Sulbactam	3g stat	Once
3.	Pre-op	IV Cefuroxime + IV Metronidazole	1.5g stat 500 mg stat	Once

Answer 4



- ▶ Pre-operative antibiotic prophylaxis should be prescribed 30-60 minutes before incision, to prevent surgical site infection.

Recommendation 18

- Antibiotic prophylaxis should be given 30-60 minutes prior to surgical incision or within 120 minutes for Fluoroquinolones and Vancomycin.



Question 5

If the patient is already completed antibiotic prophylaxis but is scheduled for surgery after 1 week, do we need to switch to a different antibiotic?

Answer 5



No. Unless the ongoing antibiotic NOT appropriate for prophylaxis against surgical site infection pathogens.



Question 6

How long should antibiotic prophylaxis be continued for a patient who has undergone ORIF?

Answer 6



Peri-operative AP should be given but not more than 24 hours post-operatively, unless otherwise indicated, as per Key Message 6

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.

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

Scenario

04



Name
Mr. X



Diagnosis: Facial Fracture



Current Status:

Admitted in ward

On TDS (three times daily) antibiotics



Planned Management:

Scheduled for Open Reduction and Internal Fixation (ORIF)

Day 4 post-trauma



Question 1

Is antibiotic prophylaxis required prior surgery?

Answer 1



YES.

Since the patient is already on TDS antibiotics, the timing of the antibiotic prophylaxis dose is crucial.

Consult the pharmacist or infectious disease (ID) physician to determine the optimal timing of AP before surgery.



Question 2

Do we need to switch to a different antibiotic?

Answer 2



NO.

Unless the ongoing antibiotic **NOT** appropriate for prophylaxis against surgical site infection pathogens.

Further Reading

References:

1. ASHP Guidelines on Antimicrobial Prophylaxis in Surgery
2. National Antibiotic Guidelines 2023
3. Recent meta-analyses on perioperative care



THANK YOU

ANTIBIOTIC PROPHYLAXIS
ORAL AND MAXILLOFACIAL SURGERY