



Prof Dr Nazri Mohd Yusof
Sultan Ahmad Shah Medical Centre @ IIUM

FRACTURE RELATED INFECTION: Approach to diagnosis

OUTLINE

- Definition
- Diagnosis
- Flow guideline
- Case example



Definition

Injury, Int. J. Care Injured 49 (2018) 505–510

Contents lists available at [ScienceDirect](#)



Injury

journal homepage: www.elsevier.com/locate/injury



Full length article

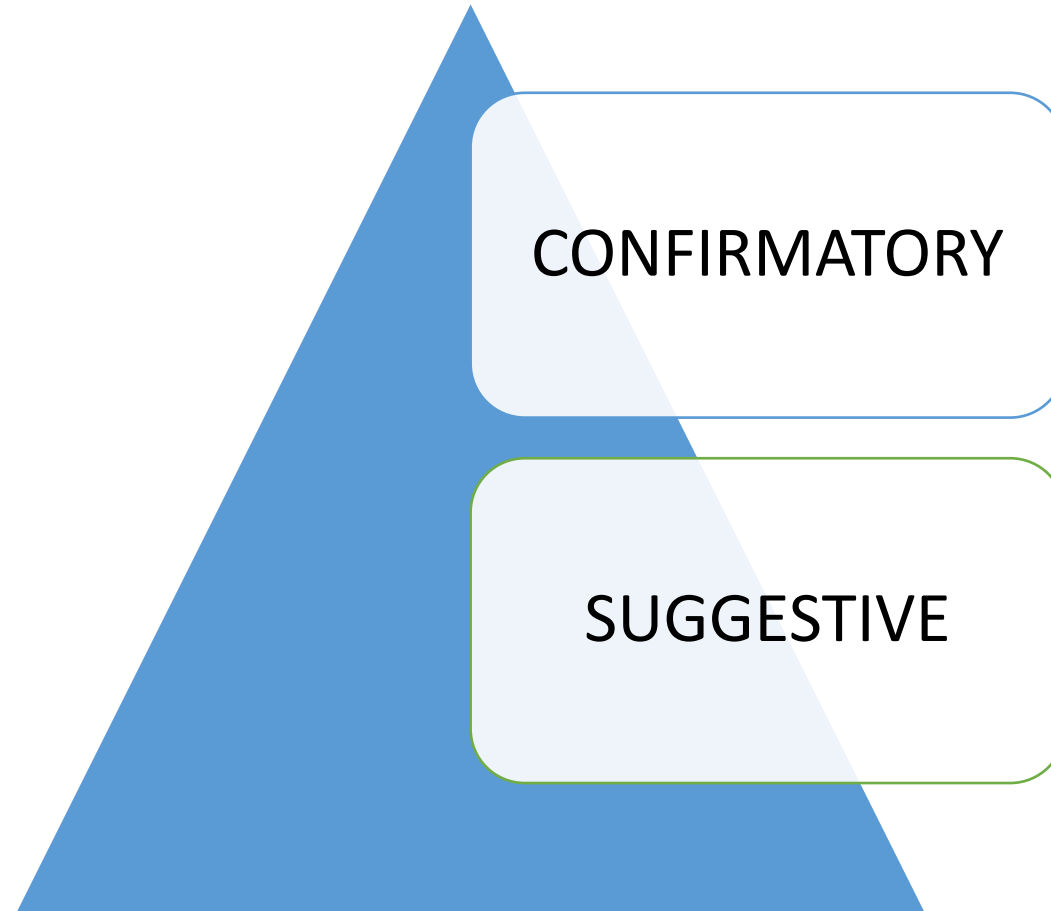
Fracture-related infection: A consensus on definition from an international expert group



Implant-related infection, surgical site infection,
Post-traumatic osteomyelitis, infected fractures,
Infected non-union

AO Foundation and European Bone and Joint Infection Society (EBJIS)

Standardised diagnostic criteria



CONFIRMATORY

SUGGESTIVE

Confirmatory

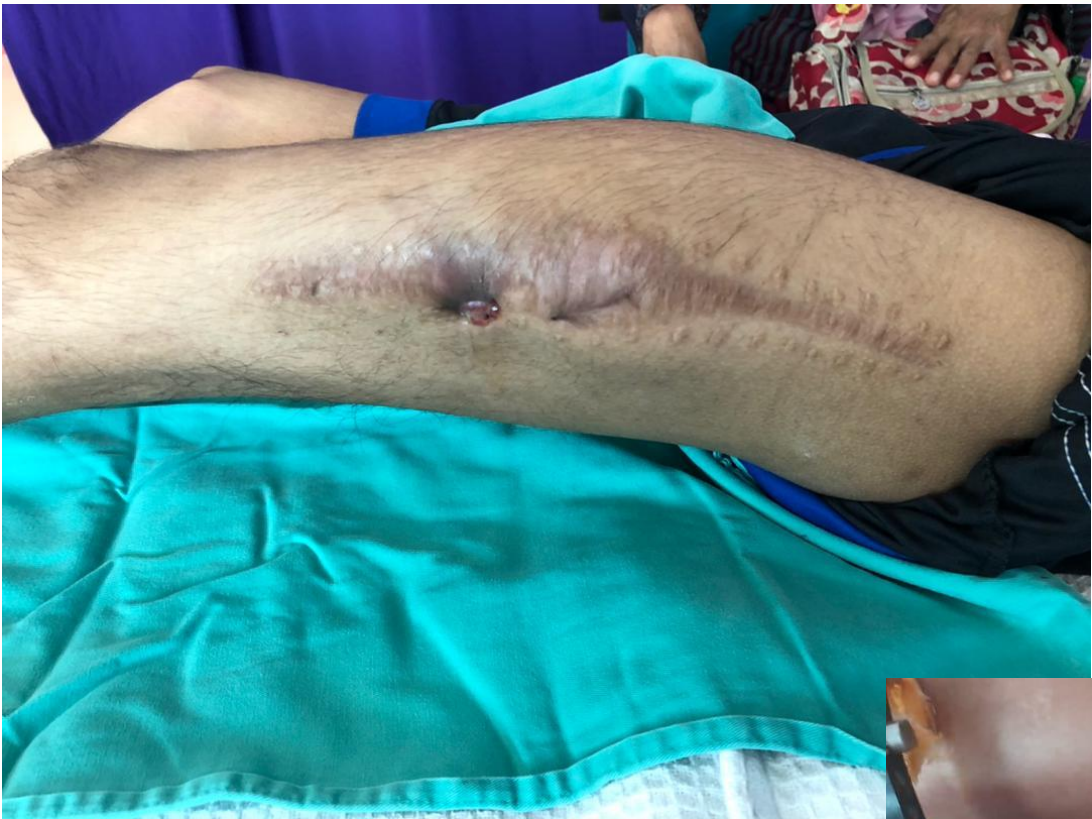
CLINICAL

- **Fistula, sinus or wound** breakdown communicating with **bone or implant**
- **Purulent** drainage from **wound** or presence of pus during **surgery**

LABORATORY

- **Pathogens** identified from at least 2 separate **deep tissue or implant** taken **during surgery**
- Presence of microorganisms from the **deep tissue HPE**

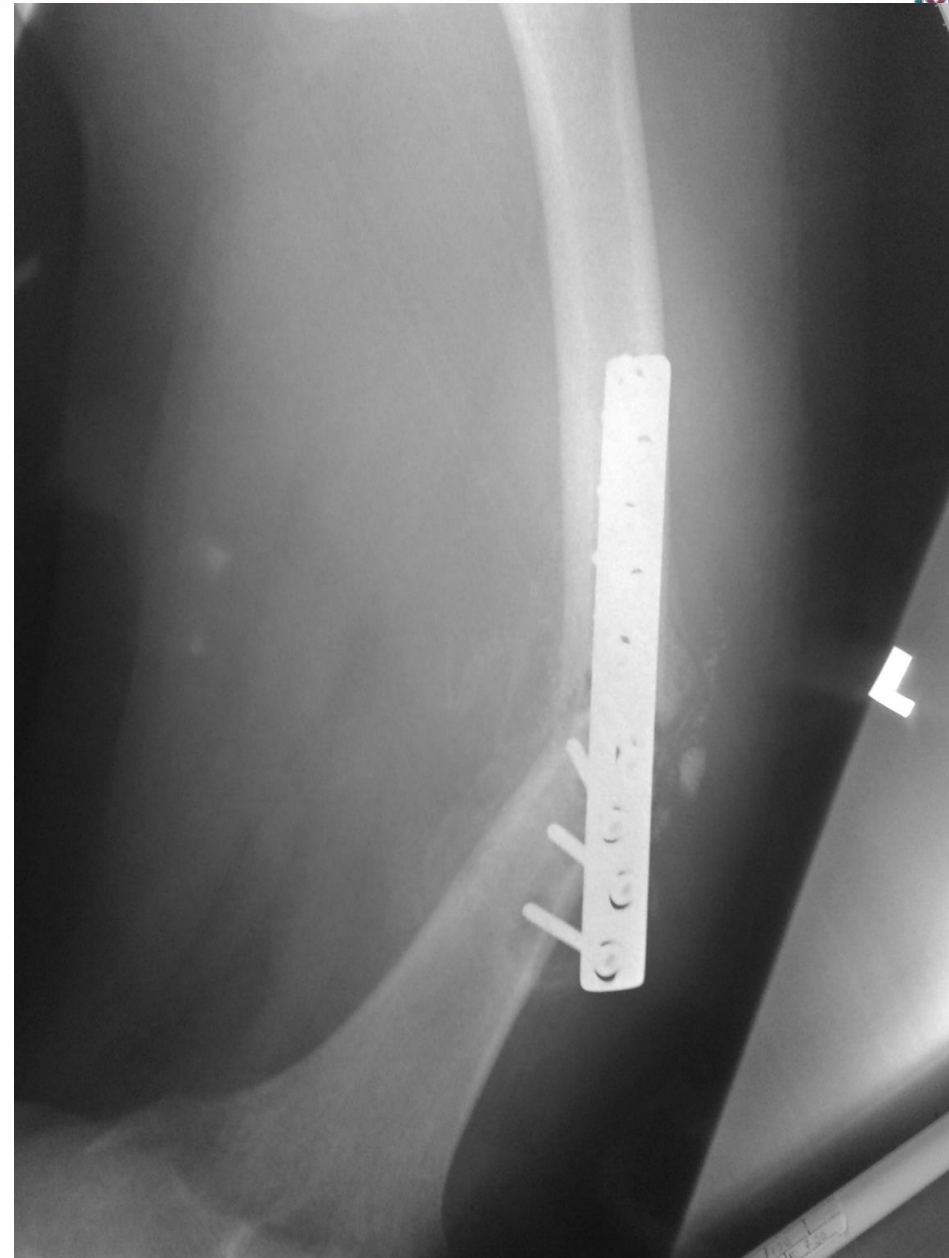
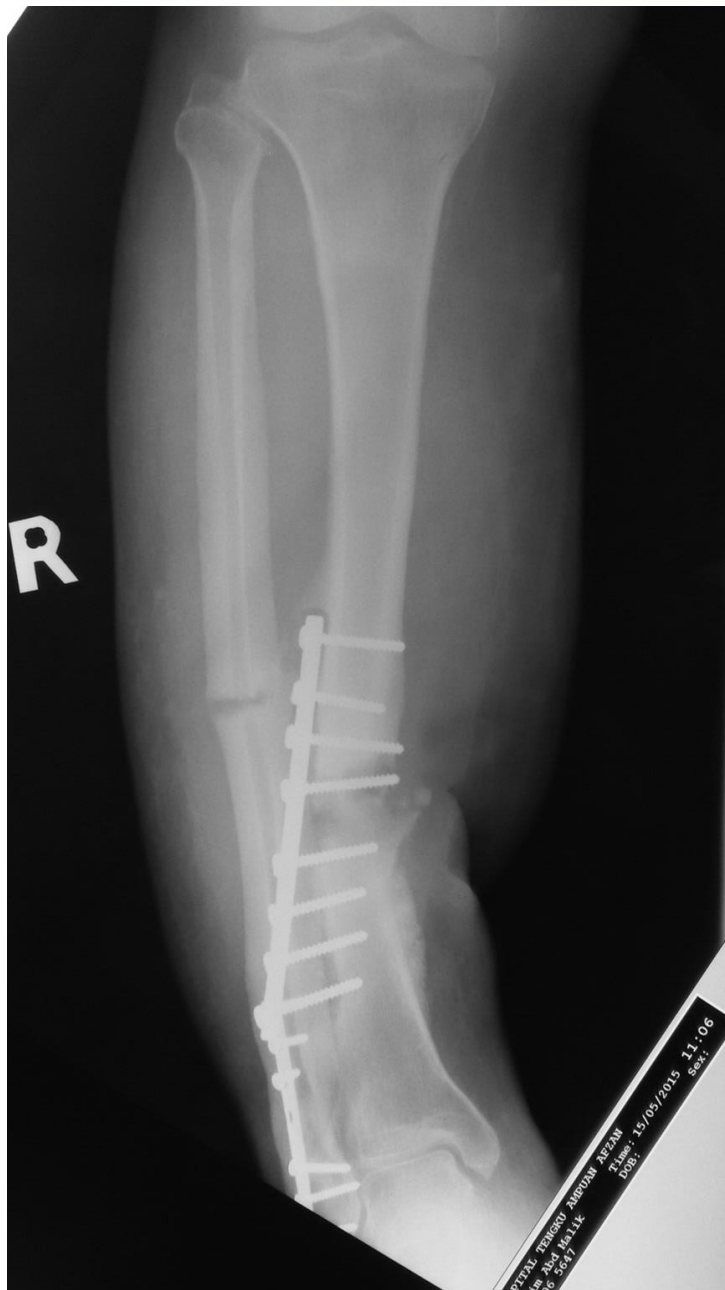


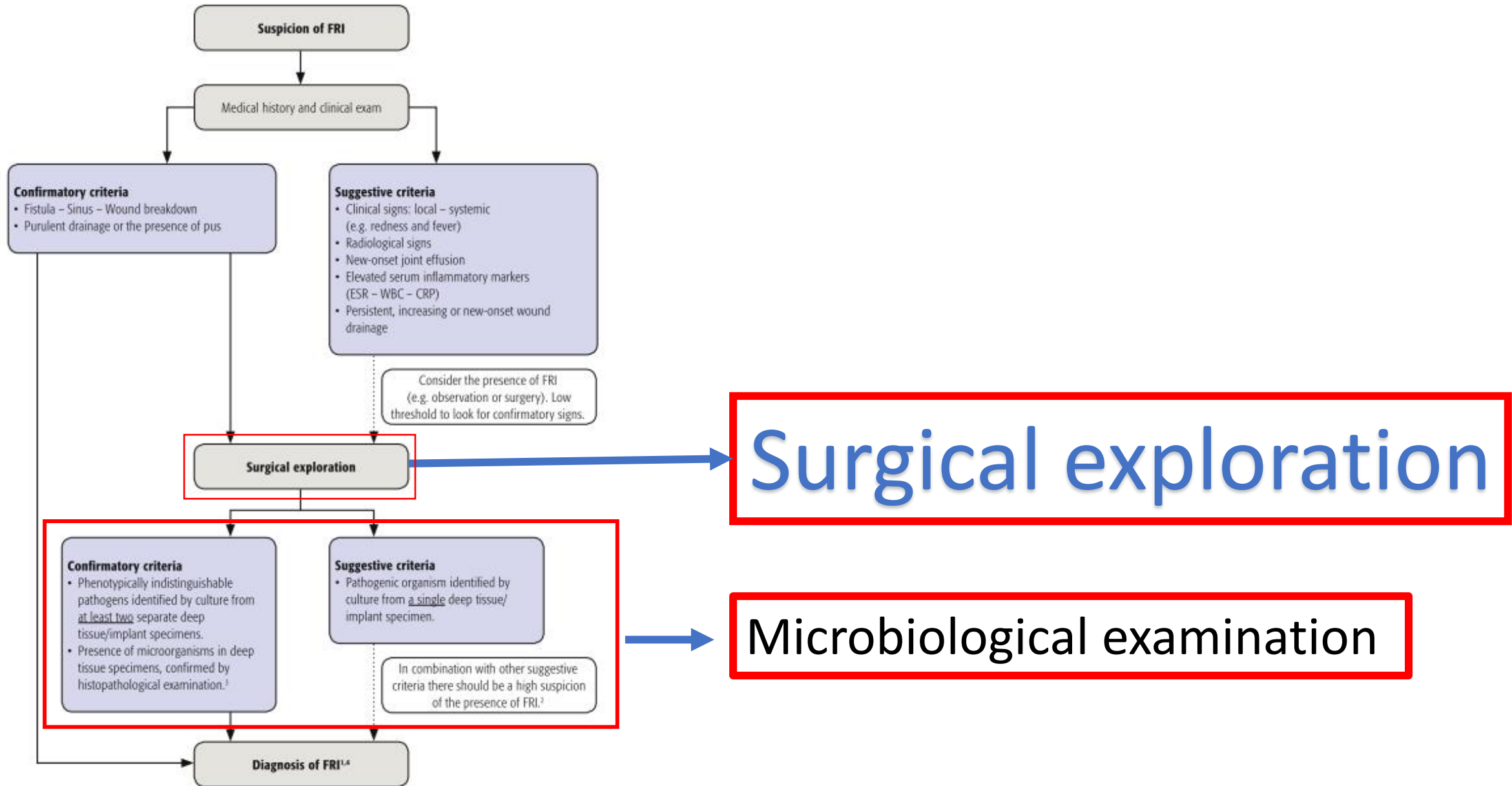


Suggestive

- Clinical
 - Pain, redness, swelling, warmth or fever
- Radiology
 - Bone lysis, implant loosening, sequestration, non-union or periosteal reaction
- Microbiology
 - Pathogen identification from a single specimen
- Hematological examination
 - Elevated inflammatory markers
- Surgical wound
 - Persistent drainage
- Joint effusion



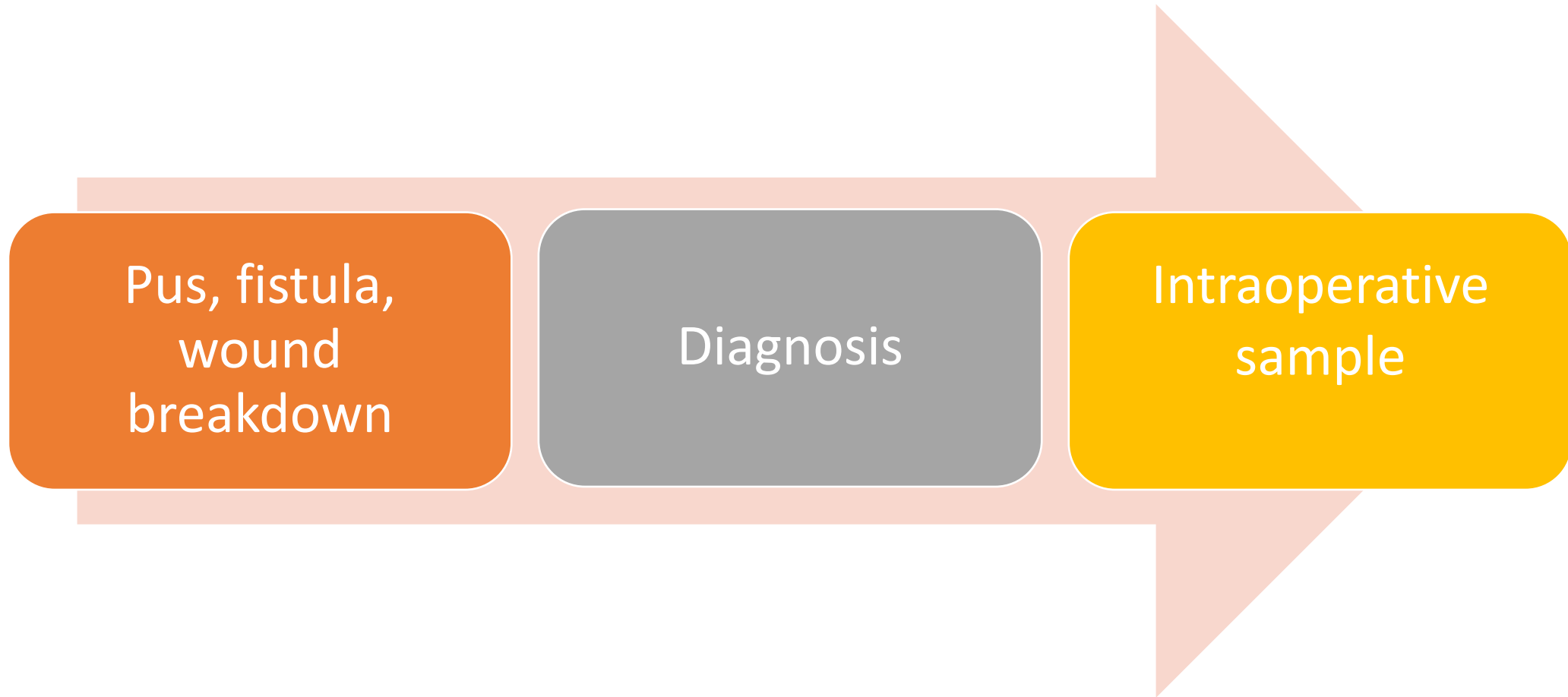




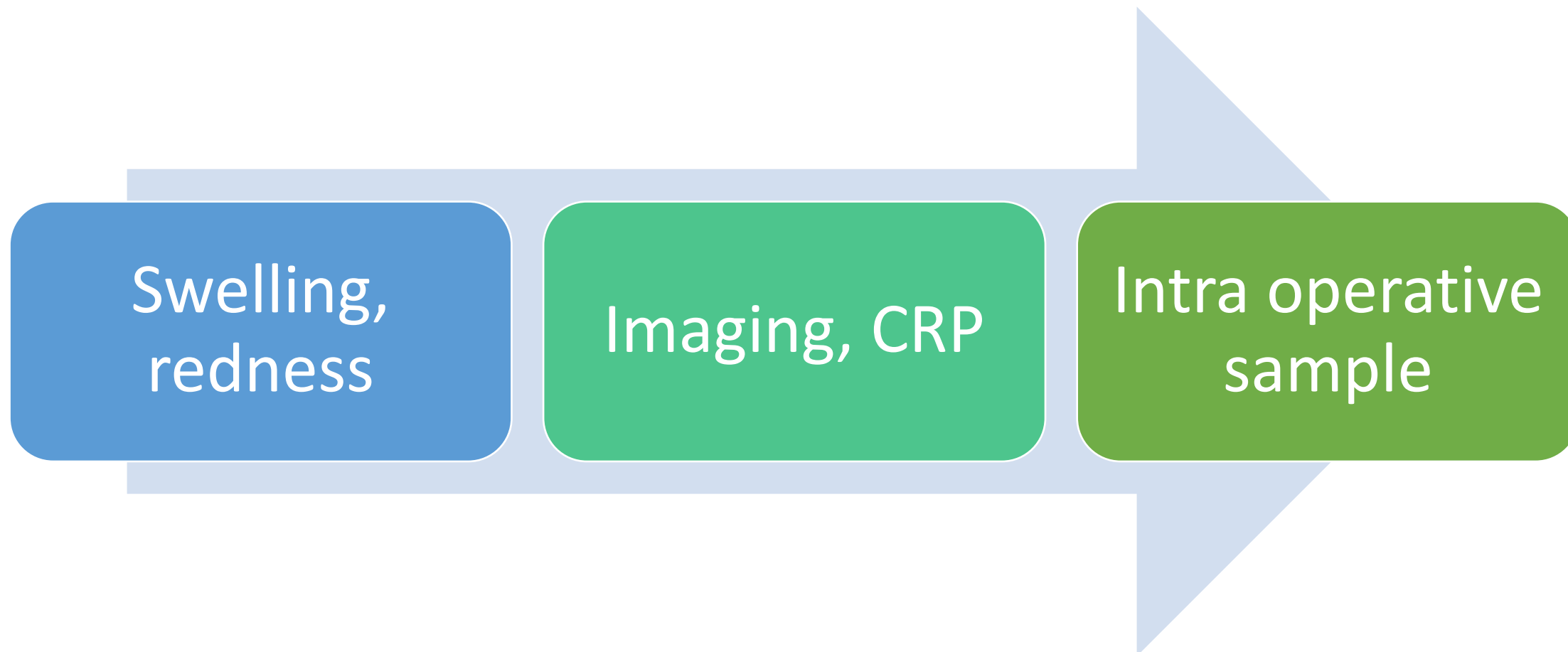
Surgical exploration

Microbiological examination

Confirm - Approach



Suggestive- Approach





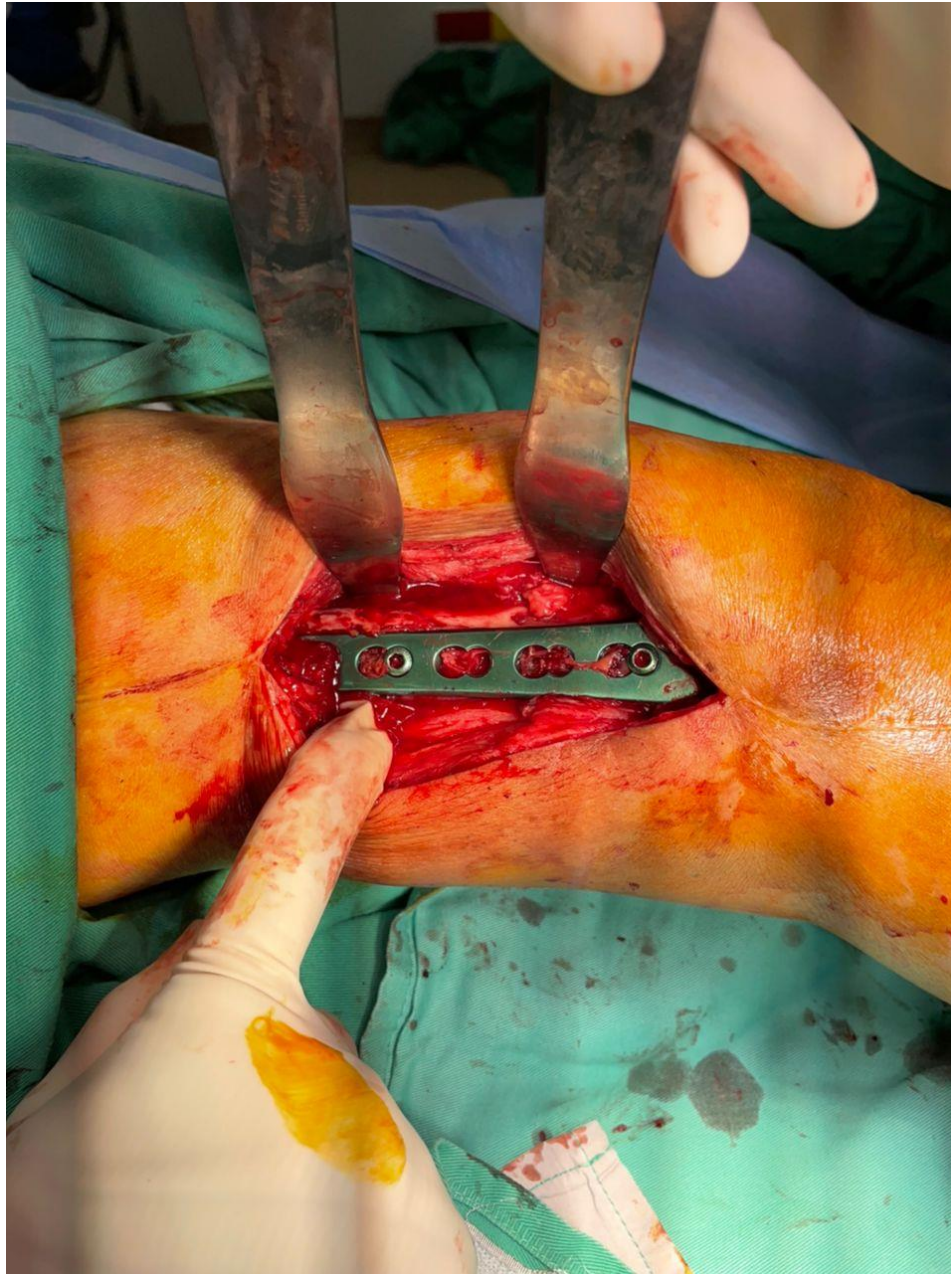
Microbiology

Important to do a proper sampling technique to get reliable results

62-year-old lady admitted to ICU with septicemic shock and thigh pain







Intraoperative
culture grew *staph aureus*

A 20-year-old man complains of eczematous skin lesion following plating of femur. His inflammatory markers are also elevated.







Plate was removed after the fracture united



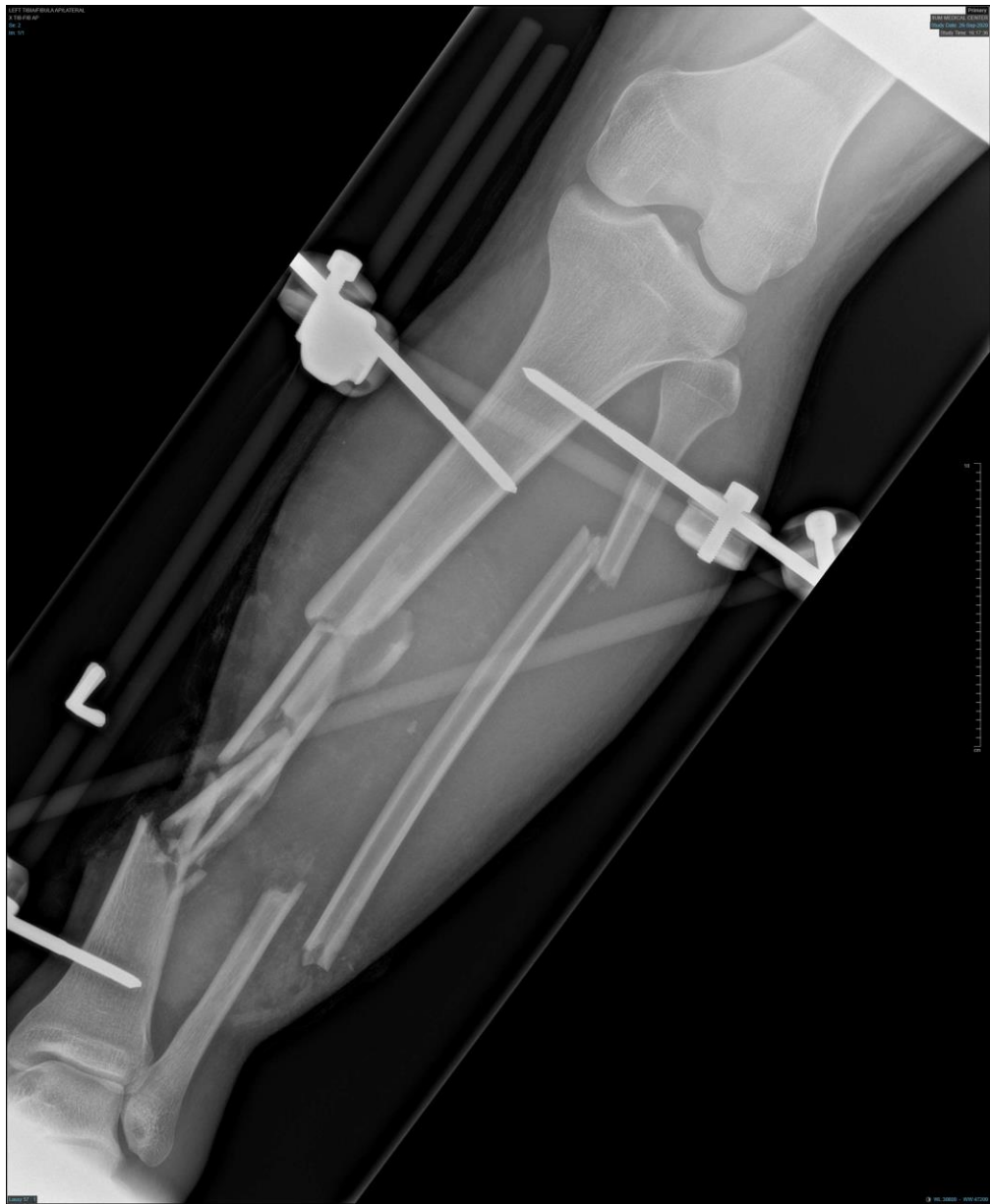
Culture grew ESBL

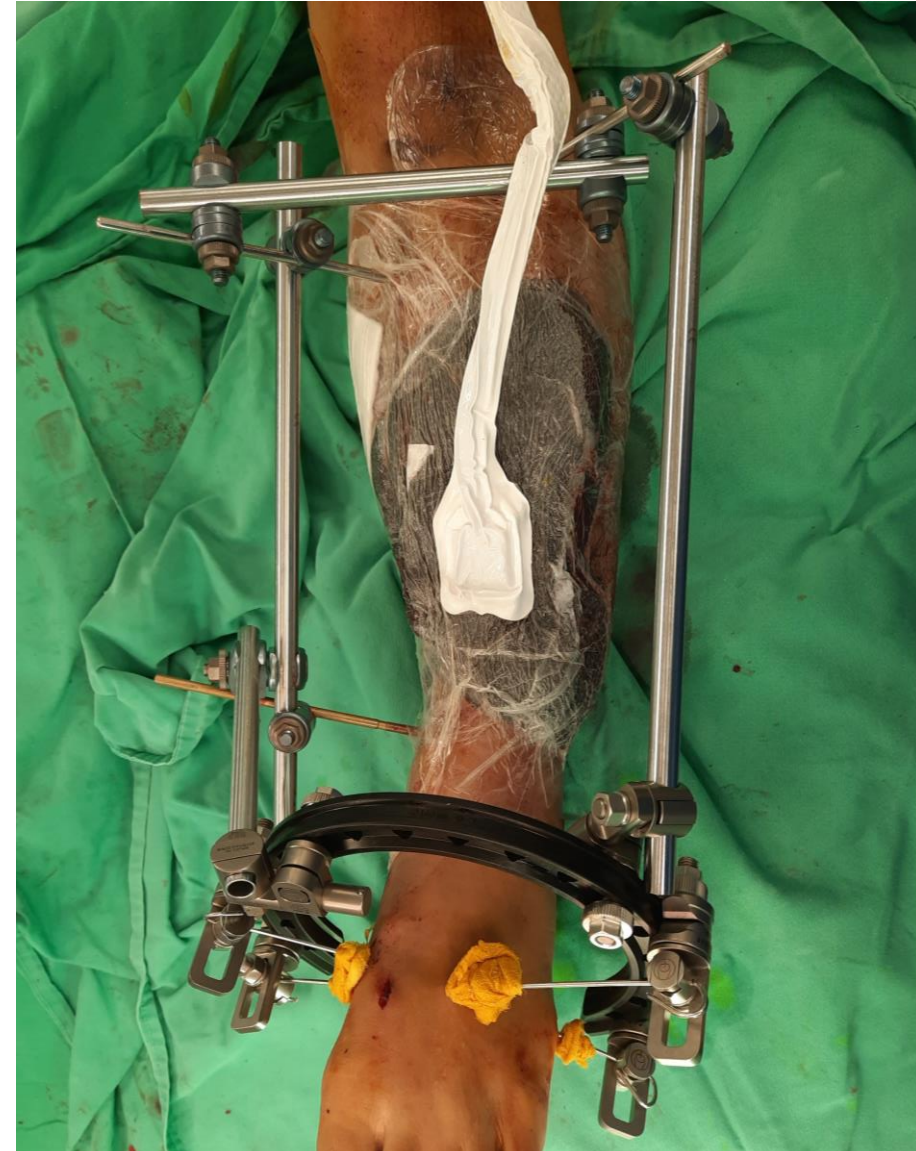


A 16-year-old boy was referred to your hospital 1-week following an open fracture of the tibia

The wound appears unhealthy with exposed tendon

Is this wound infected?





He underwent repeated debridement and vacuum dressing

- Wound culture grew ESBL
- Is this contaminant or a true pathogen?



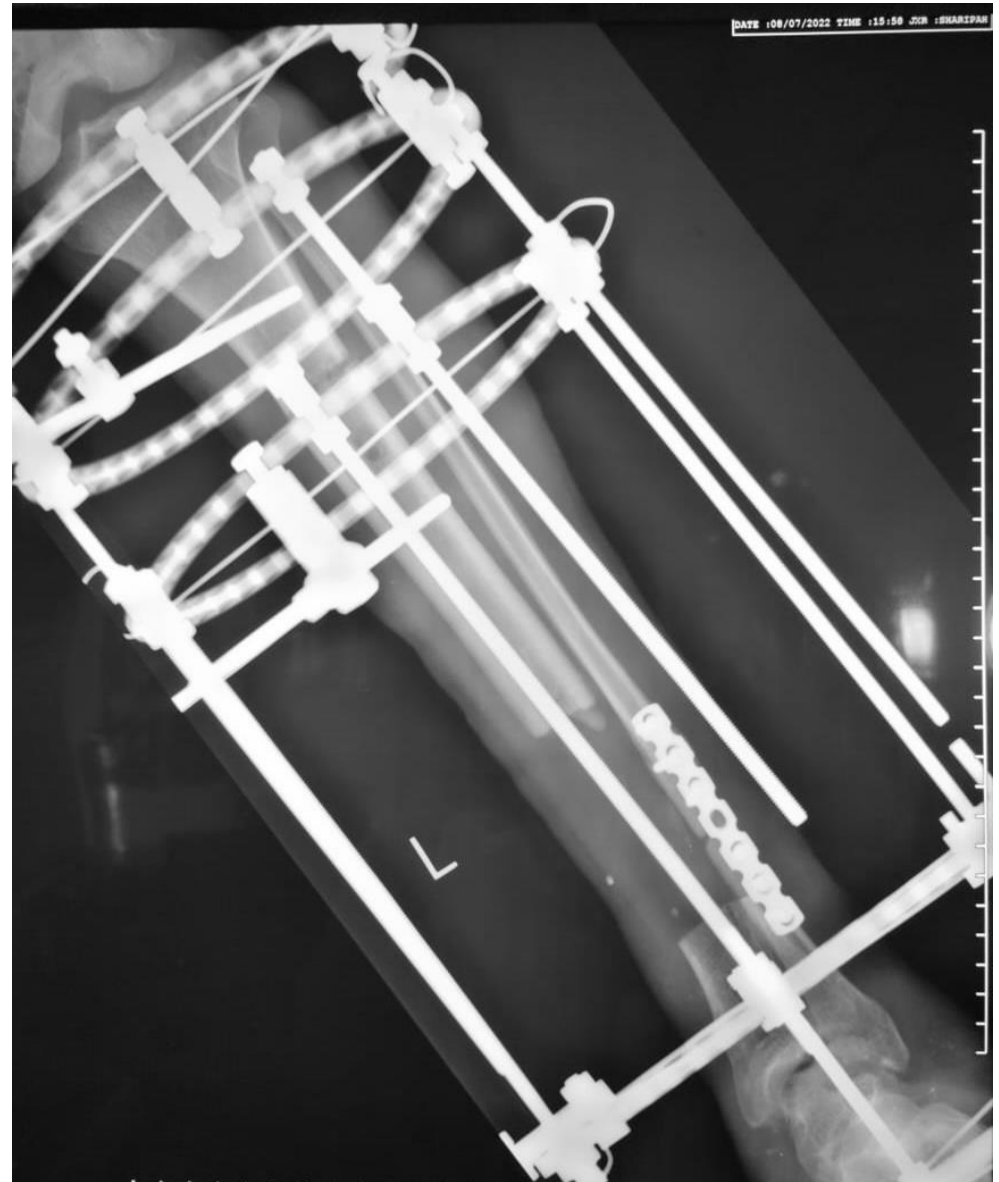
A 60 year old man 3 weeks following road traffic accident

Referred for the management of open fracture



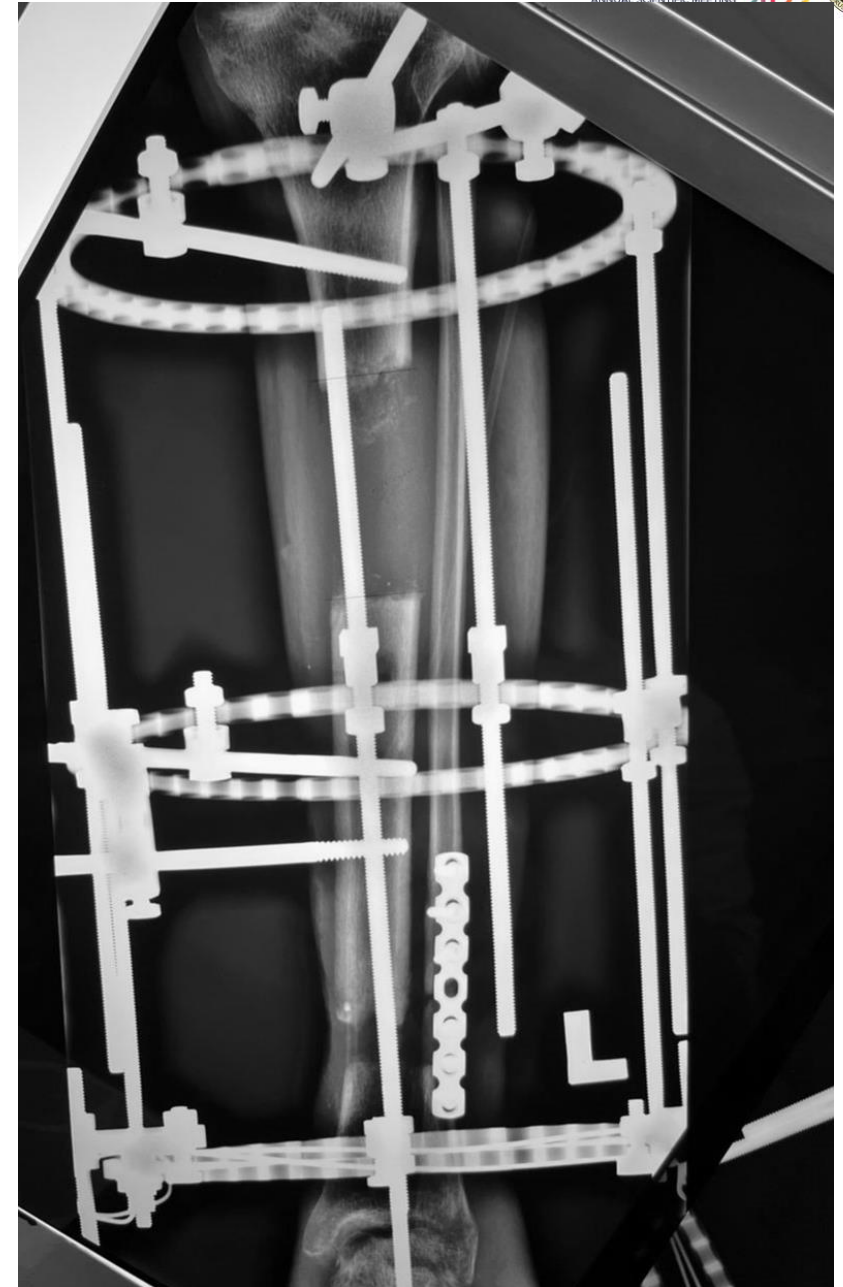
An exposed bone with healthy granulation tissue and without signs of cellulitis

Is this consider infection?





No need
long term
antibiotic





Bacteria are all over us



Treat infection like the dentist





Approach infections like tumors



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INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA
بوتريسني ليزاروف ليمب
Garden of Knowledge and Virtue



20th NATIONAL BASIC ILIZAROV LIMB RECONSTRUCTION WORKSHOP





10th -11th August 2023
**AC Hotel by Marriott,
 Kuantan, Pahang**

For Registration, Visit
www.osara.my or Scan Below:





CPD POINT
will be
awarded

ORGANISED BY:



DEPT. OF ORTHOPAEDICS,
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LEADING THE WAY



**52nd MALAYSIAN ORTHOPAEDIC ASSOCIATION
ANNUAL SCIENTIFIC MEETING / ANNUAL GENERAL MEETING 2023**

Enhancing Recovery in Orthopaedic Surgery

Date: 15th to 17th June 2023

Website: moaasm.com



Prof Dr Nazri Mohd Yusof
International Islamic University Malaysia
Kulliyah of Medicine IIUM Kuantan Campus,
Bandar Indera Mahkota,
25200 Kuantan, Pahang
Email: nazrimy2000@gmail.com

Dear Prof Dr Nazri Mohd Yusof,

**WELCOME LETTER TO THE 52nd MALAYSIAN ORTHOPAEDIC ASSOCIATION ANNUAL SCIENTIFIC MEETING
2023 (52ND MOA ASM 2023)**

Warm greetings from the Malaysian Orthopaedic Association (MOA), Asia Pacific Orthopaedic Research Society (APORS) and the Organising Committee of the 52nd Malaysian Orthopaedic Association Annual Scientific Meeting 2023 (52nd MOA ASM 2023).

CONGRESS MAIN CONTACT PERSON (AVAILABLE ON WHATSAPP)

Shimal + (60) 12 516 6494 | Kasthri: +(60) 17-986 9733

DRESS CODE

For 52ND MOA ASM 2023 : Business Formal

MOA President's Dinner :Batik / Smart Casual

CONFERENCE VENUE

Setia SPICE Convention Centre

No.108C Jalan Tun Dr. Awang, 11900 Penang

Tel: +604-643 2525

TRAVEL & HOTEL

We note that you are travelling to Penang via Flight.

Upon arrival at the Penang Airport, please take a Grab to AMARI Hotel Penang.

Please note the hotel check in and check out time in the following section.

Hotel Room	AMARI Hotel Penang
Room Type	Hotel Room with 1 breakfast
Check In	14th June 2023, after 3.00 pm
Check Out	17th June 2023, before 12.00 pm

If you are going back by flight without check in luggage, please allow yourself at least 1 hour to check in to the airport. If you are flying with check in luggage, please allow yourself at least 1 and ½ hours at the airport. If unsure of how much time to allocate, please check with AMARI Hotel Reception.



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YOUR SCHEDULE

Date & Time	Venue	Session	Presentation Title	Role
16th June 2023, (Friday) 10.15 am – 11.15 am	Lecture Hall A, Ground Floor, SPICE	Symposium 9: Postoperative Orthopaedic Infection	Fracture Related Infection: Approach And Diagnosis <i>There will be 3 other topics in this session, and a combined Q&A at the end of the session.</i> (10 minutes presentation) (Slide size 16:9)	Speaker
17th June 2023 (Saturday) 10.00 am–11.00 am	Lecture Hall A, Ground Floor, SPICE	Education Session 2	Open Fracture Tibia - How I Debride And Stabilized <i>There will be 3 other topics in this session, and a combined Q&A at the end of the session.</i> (10 minutes presentation) (Slide size 16:9)	Speaker

Please refer to the website, moaasm.com for more information including the names and topics of the other presenters.

If you are presenting on day 2, Our Speaker ready room will be open on Day 1. Please drop your presentation slides on Day 1.

If you are presenting on day 3, Our Speaker ready room will be open on Day 1 & Day 2. Please drop your presentation slides on Day 1 or Day 2.

You may also send your presentation slides to us via email before you leave for the conference at speaker.vip@moaasm.com.

If your file is very big please use WeTransfer, <https://wetransfer.com/>.

Please do let us know if you have any special requests for your presentation.

MOA PRESIDENT'S DINNER

Date : 16th June 2023, Friday
Time : 7.45 pm
Venue : Amaya Food Galley, Level 4, Amari Hotel
Dress Code : Batik / Smart Casual

We take note that you have informed us that you will not be attending the MOA President's Dinner.

In the event that you change your mind please let us know before 12.00 pm on 15th June 2023.

We hope you have a wonderful meeting.

Prof Dr Tunku Kamarul Zaman Tunku Zainol Abidin
President of
Malaysian Orthopaedic Association 2022 – 2023

Prof Datuk Dr Sabarul Afian Mokhtar
Organising Chairperson
52nd Malaysian Orthopaedic Association
Annual Scientific Meeting 2023

Dr Shams Amir Shamsul Bahar
Scientific Chairperson
52nd Malaysian Orthopaedic Association
Annual Scientific Meeting 2023

Organised By:

In Collaboration With:



ANNUAL SCIENTIFIC MEETING & ANNUAL GENERAL MEETING 2023

Certificate OF ATTENDANCE

THIS CERTIFICATE IS PROUDLY PRESENTED TO

Nazri Bin Mohd Yusof

52nd Malaysian Orthopaedic Association
Annual Scientific Meeting / Annual General Meeting 2023

15th to 17th June 2023

Prof Dr Tunku Kamarul Zaman Tunku Zainol Abidin
President
Malaysian Orthopaedic Association 2022 - 2023

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