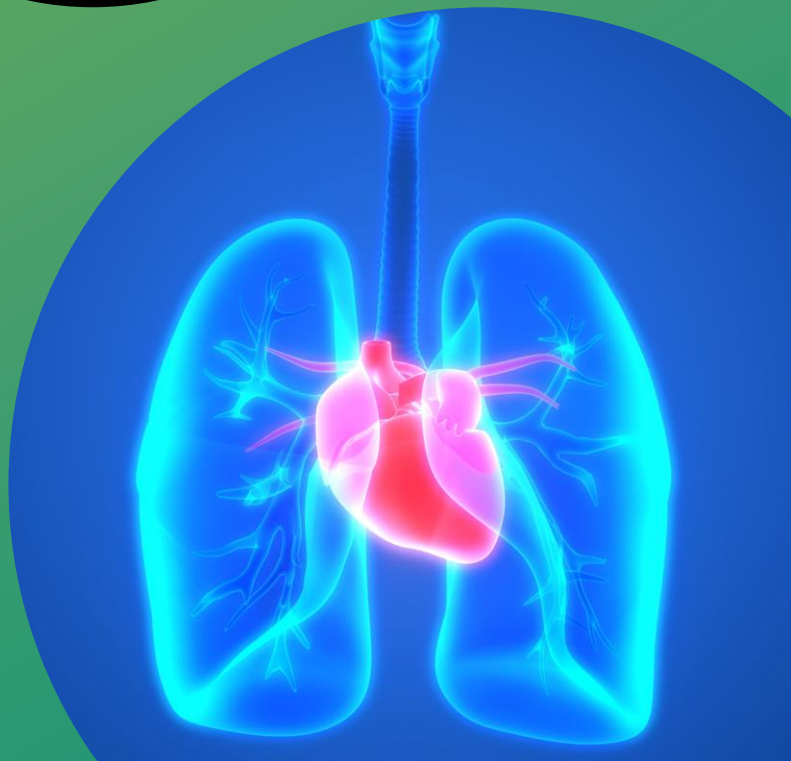
INFECTIONS IN TRANSPLANT PATIENTS

Dr Clementine Fraser – Respiratory and Transplant physician

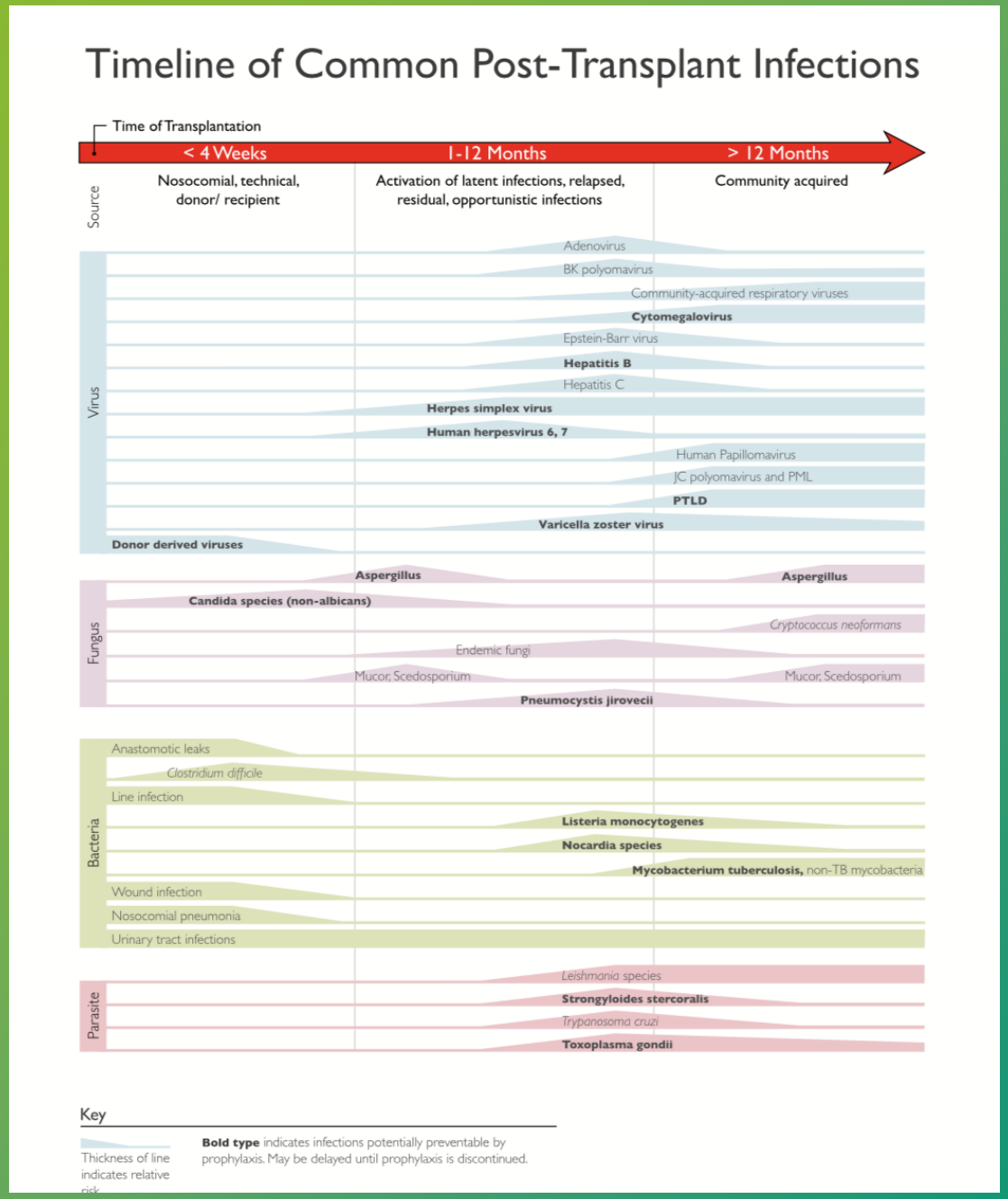


Infections in transplant patients

- Leading cause of problems especially in first year.
- Clinical manifestations can be few or atypical in immunocompromised hosts
- Eg. 40% of infection cause no fever
- Many of the pathogens are uncommon in immunocompetent individuals
- Important to try to get exact diagnosis so correct decisions can be made about treatment
- Drug interactions a significant aspect of decisions about treatment (immunosuppression etc.)
- Element renal decline.

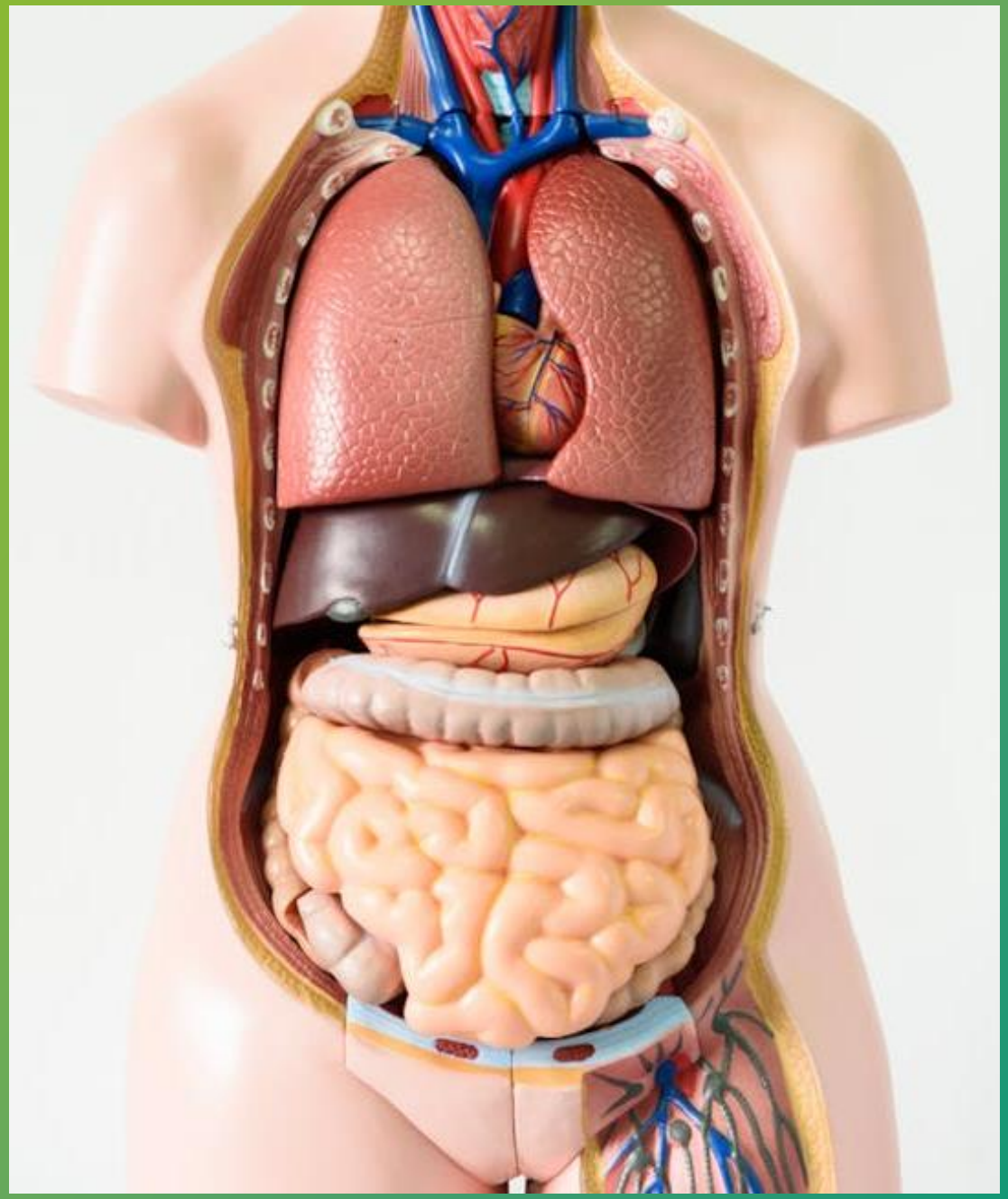
Different Types of Infection

- Bacterial Infections
- Viruses
- Fungus



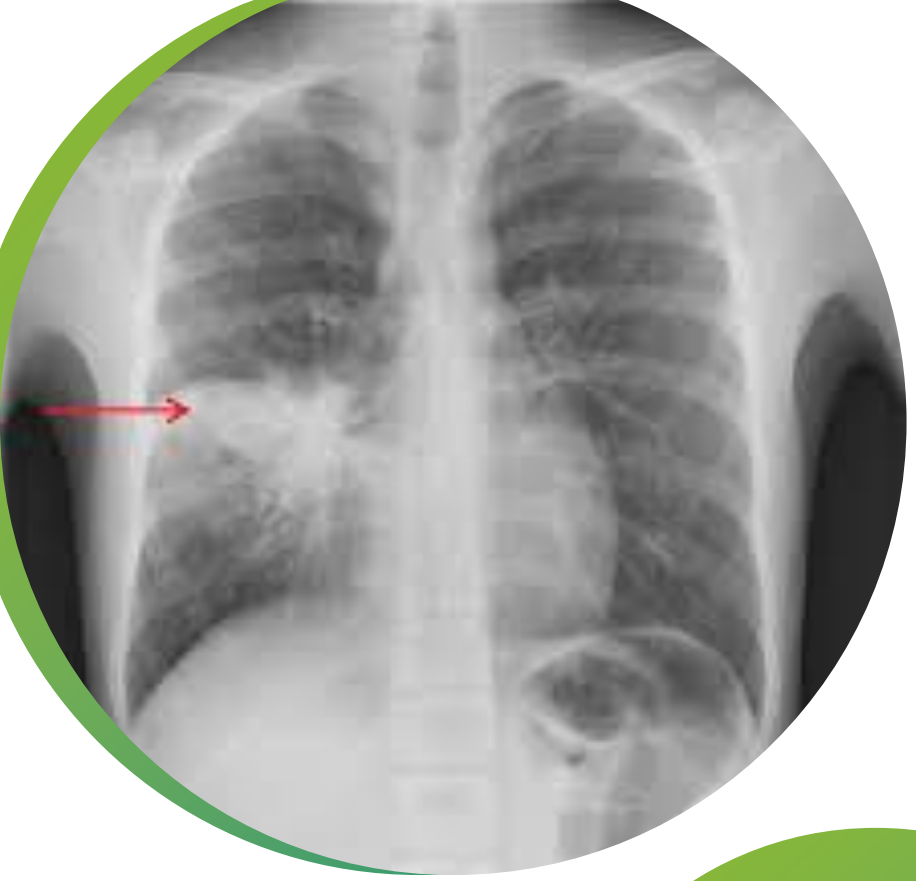
- Donor (fluid/ BAL)
- Ventilator – positive pressure/ tubes etc.
- Immunosuppressive therapy – more immunosuppressed for 3 months. Higher aims
- Procedures / lines - (leaks/fluid collections/poor wound healing) - Urinary/Vascular/Dialysis catheters, surgical drains,
- Wounds - breaks in skin/mucosae

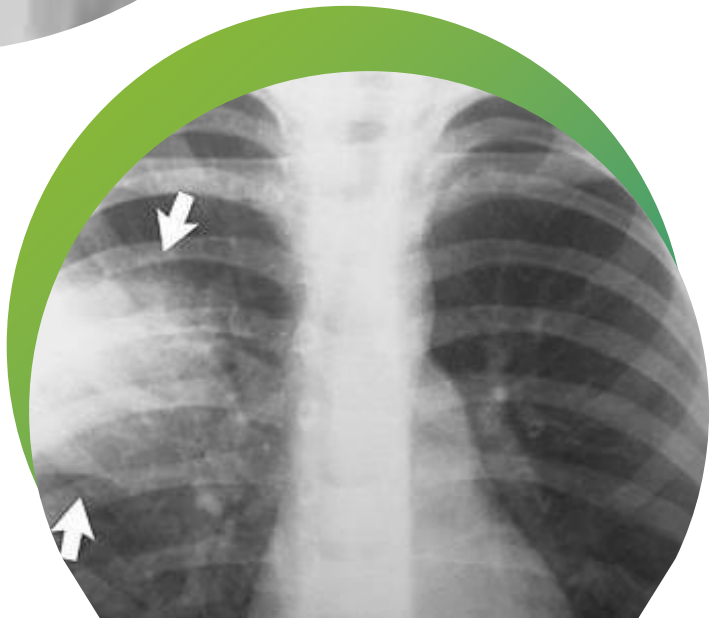
- Lung slightly more than heart
- Lungs not sterile
- Open to elements
- RATG (aggressive immunosuppressant early on)



Common Sites

- Chest
- Urine (UTI)
- Skin (cellulitis)
- Bowel
- Sternum
- Line (eg. dialysis)





Chest Infections / Pneumonia

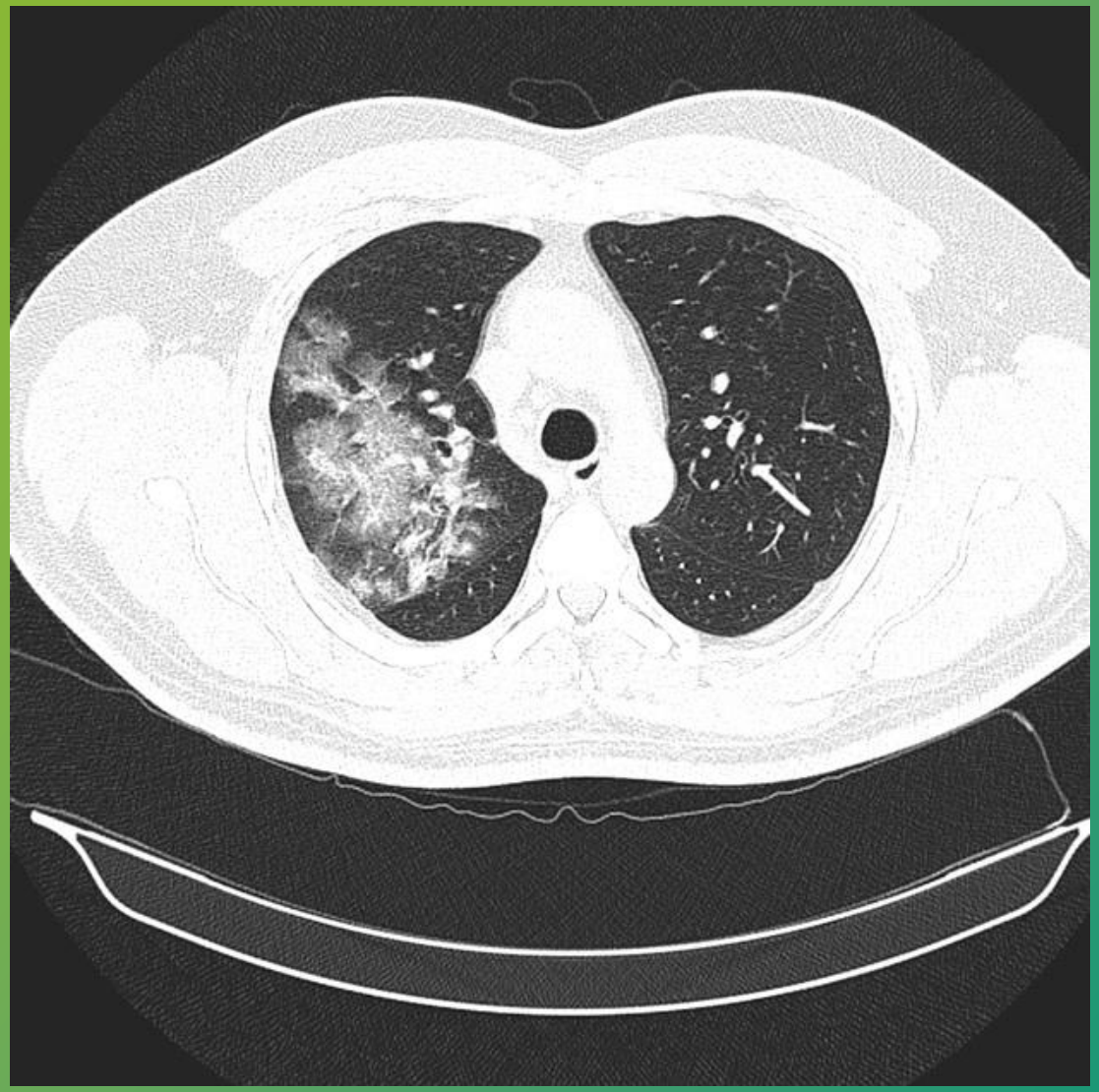
- Interchangeable
- Pneumonia – changes on CXR
- Sputum
- Fever
- Send off sample
- Bloods/CXR
- Spirometry (lung)

Targeting treatment

SPUTUM CULTURES

WHAT GROWN BEFORE

WHAT RADIOLOGY AND BLOODS LOOK LIKE



Covid (Virus)

- Cough cold fever
- Lateral flow
- Swab
- Early might be eligible for medications that reduce severity

Molnupiravir

Sotrovimab

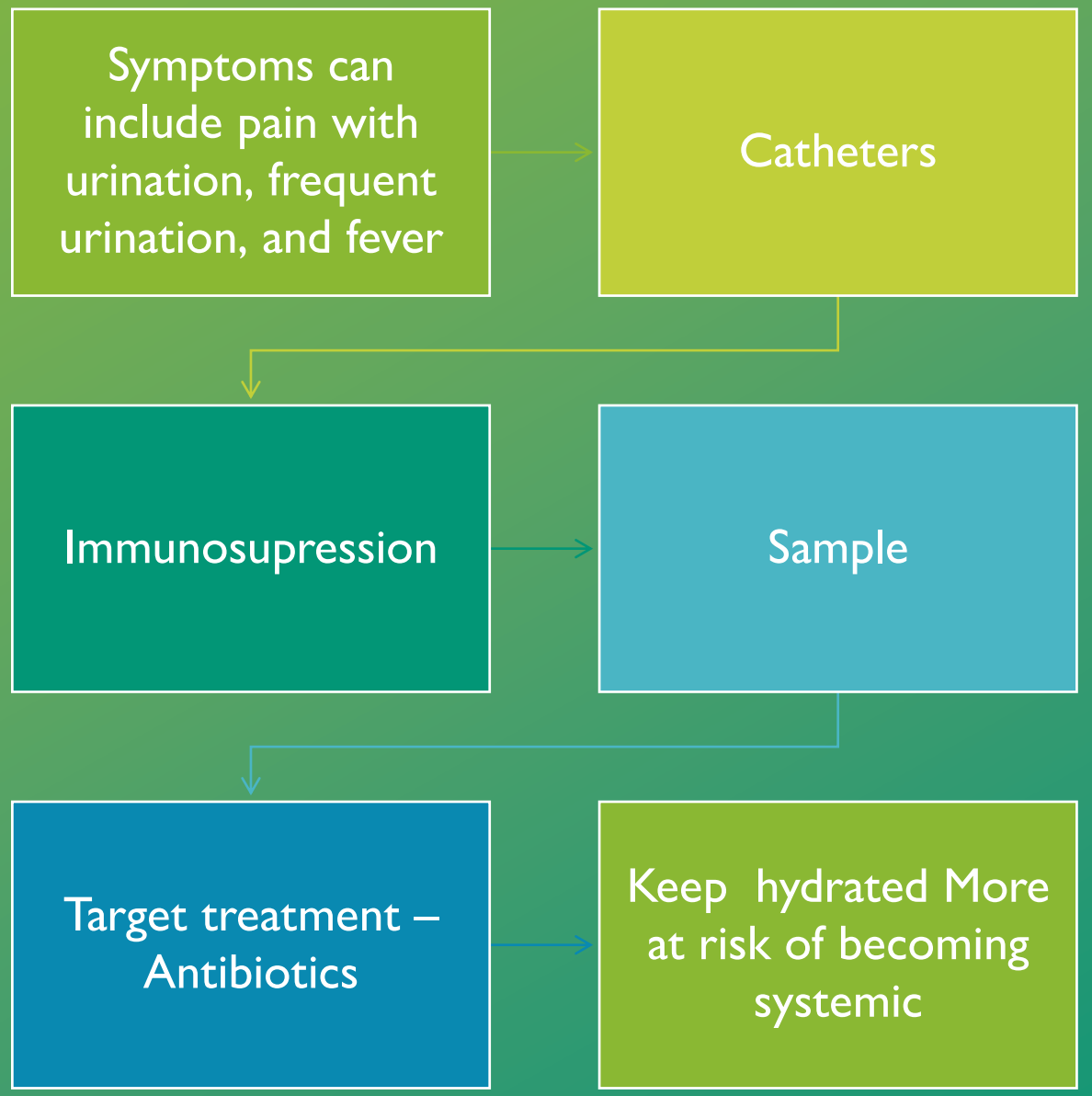
Paxlovid (nirmatrelvir / ritonavir combination), **should not be** used in transplant recipients due to the significant interaction with calcineurin inhibitor (Tac) and mTOR (siro).

Remdesivir

IL-6 inhibitors (Tocilizumab and Sarilumab, Sotrovimab)

Keep lateral flows at home

Urinary Tract Infections



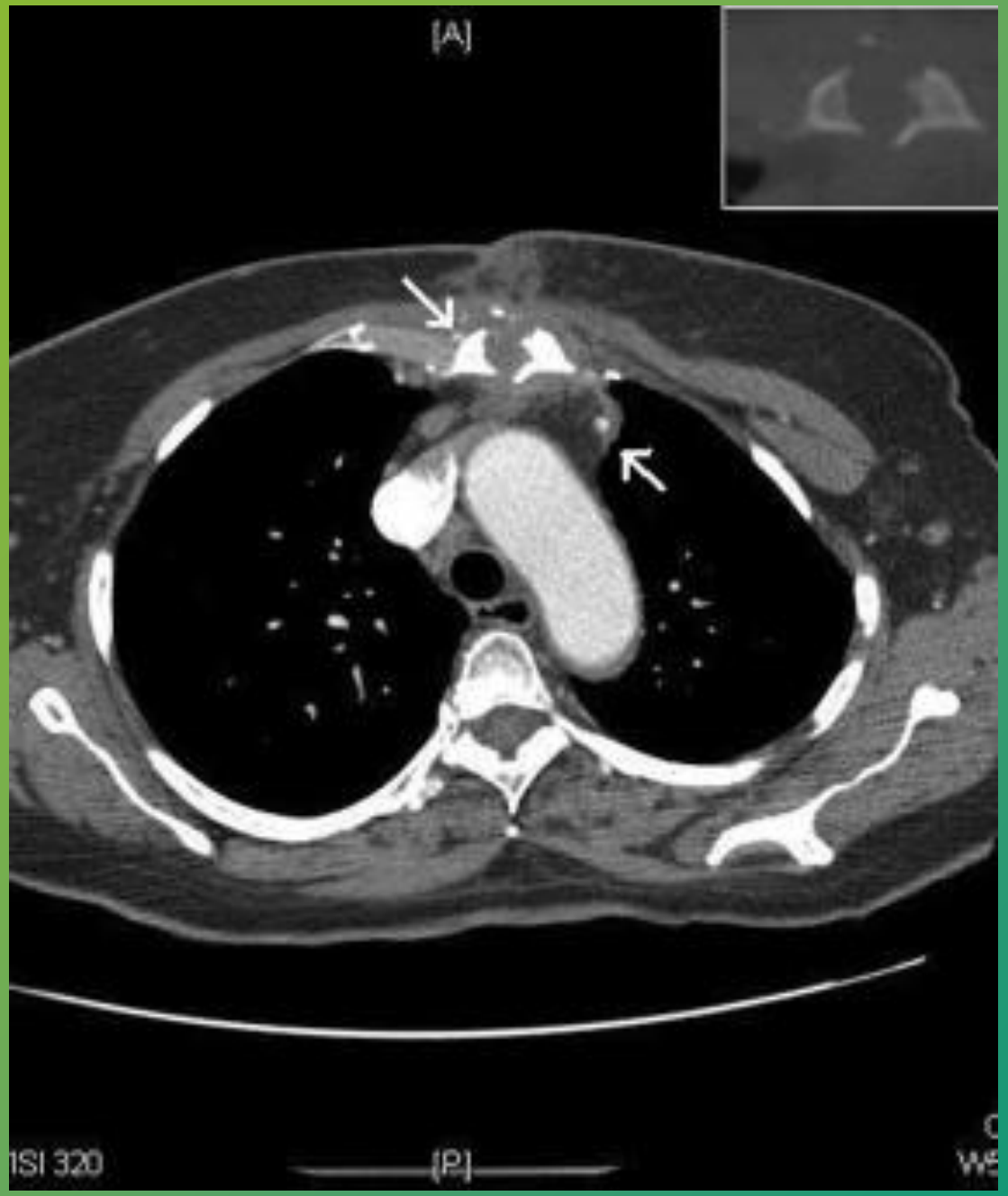
Diarrhoea

- Normal flora disrupted. Immunosupression.
- Microbiome
- Norovirus
- C difficille
- CMV

Table 1. Common causes of post-transplant diarrhea

Infectious	Noninfectious
Bacterial	IS medications
Clostridium difficile	Mycophenolate
Campylobacter spp.	Tacrolimus
Salmonella spp.	Cyclosporine
Bacterial overgrowth	Sirolimus
Aeromonus spp.	
Escherichia coli	
Viruses	Non-IS medications
CMV	Antibacterial
Norovirus	Antiarrhythmic
Sapovavirus	Antidiabetic
Rotavirus	Laxatives
Adenovirus	Proton pump inhibitors
	Protease inhibitors
Parasitic	Other
Giardia	GVHD
Cryptosporidium	PTLD
Isosopora Cyclospora	IBD
Microsporidium	Colon cancer

- Send sample
- Stay hydrated – protect kidneys
- May need treatment depending on cause



Sternum Osteomyelitis (bacteria)

Weeping → Crunching/ clicking Instability → Swab

CMV

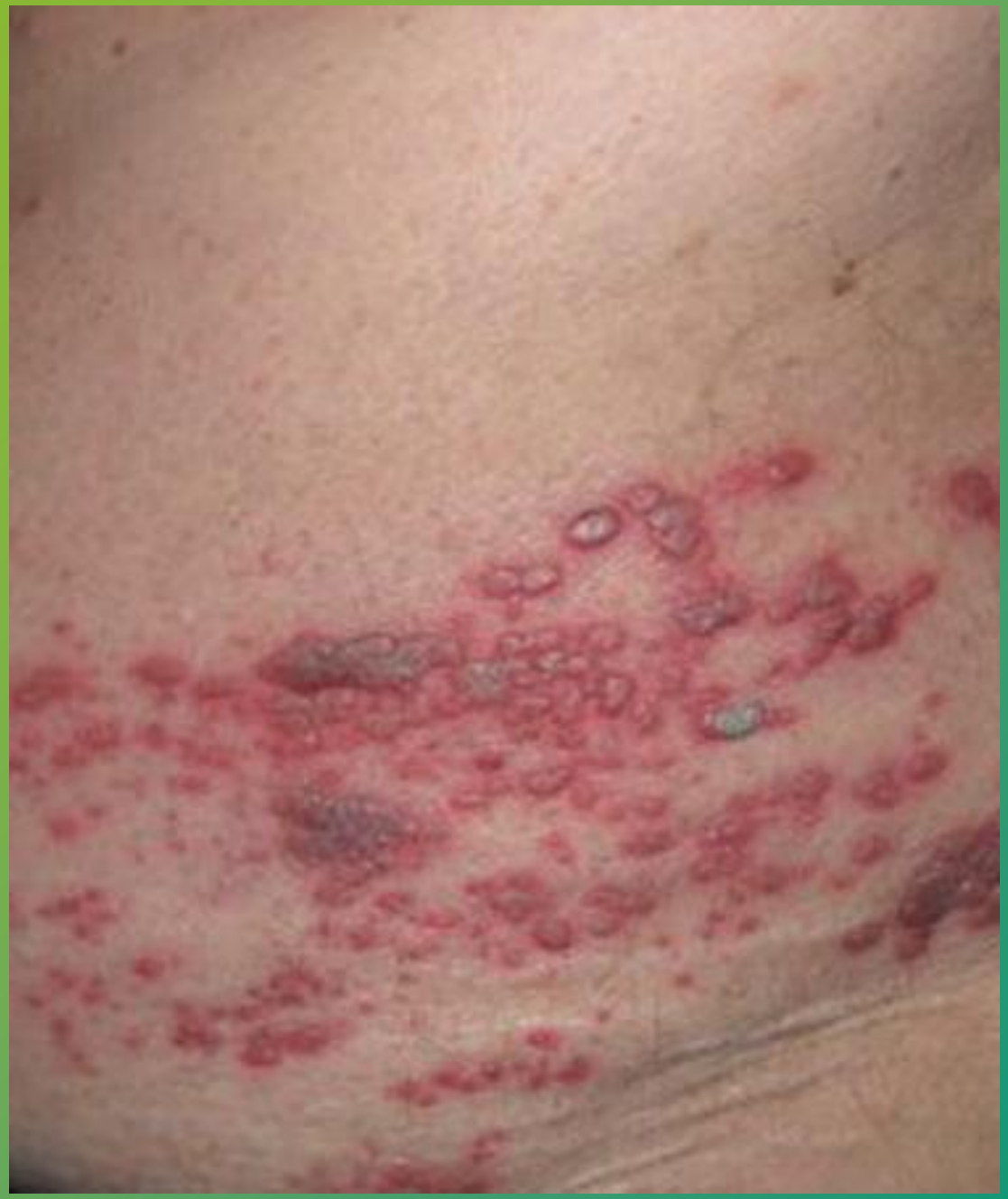
- CMV is a common virus that is usually harmless in the immunocompetent population.

- **VALGANCICLOVIR**
  - Neutropenia, nephrotoxicity
- **FOSCARNET**
  - Nephrotoxicity
- **MARIBAVIR**

- **Risk Factors - Who is most at risk?**

CMV

- Donor-Recipient Serological Mismatch:
- D+/R- (Donor positive, Recipient negative):
- Intensive Immunosuppression:
- Longer Ischemic Time:
- Type and Duration of Prophylaxis:
- Premature Discontinuation of Antivirals:



Varicella

- Contact has chicken pox/shingles
  - If direct contact or if unsure, advise full varicella tx
  - Same day prescription of aciclovir 400mg 5x daily for 7-10 days
  - If develop rash they must contact transplant centre; disseminated Zoster can be serious may need IV aciclovir/ steroids
  - Eligible for Shingrix vaccine

EBV associated PTLD

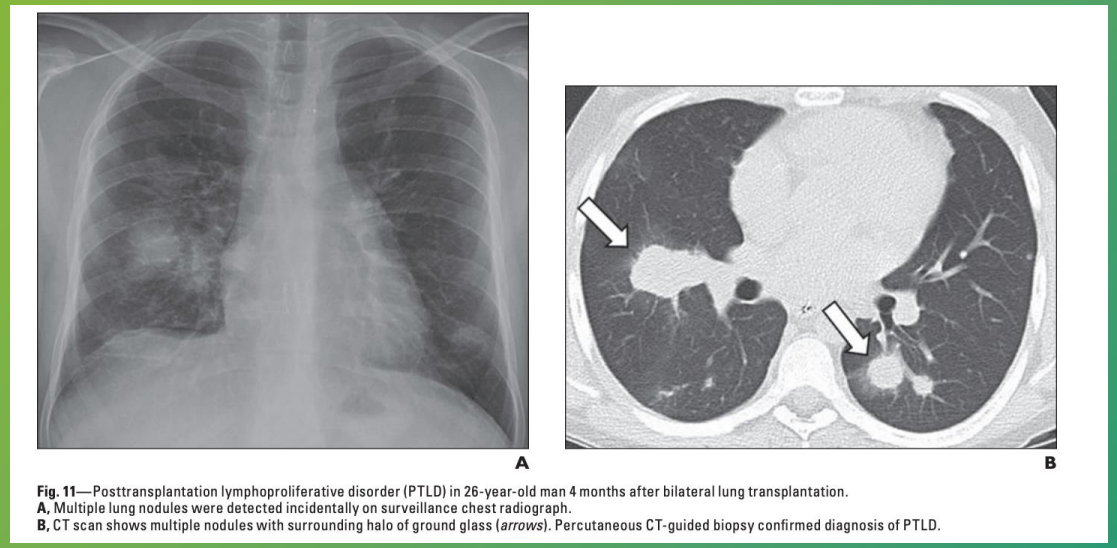


Fig. 11—Posttransplantation lymphoproliferative disorder (PTLD) in 26-year-old man 4 months after bilateral lung transplantation.
A, Multiple lung nodules were detected incidentally on surveillance chest radiograph.
B, CT scan shows multiple nodules with surrounding halo of ground glass (*arrows*). Percutaneous CT-guided biopsy confirmed diagnosis of PTLD.

- Post-transplantation lymphoproliferative disorder (PTLD) is a widely recognized complication of transplantation.
- Uncontrolled growth of B lymphocytes –
- Fever, weight loss, night sweats, fatigue, and Lymphadenopathy
- The incidence of PTLD rare
- Primary Epstein-Barr virus (EBV) infection is a major risk factor as well as immunosuppression.
- Patients who were EBV- before lung transplant are more likely to develop PTLD
- Ix - CT CAP if suspect – **EBV DNA copies**

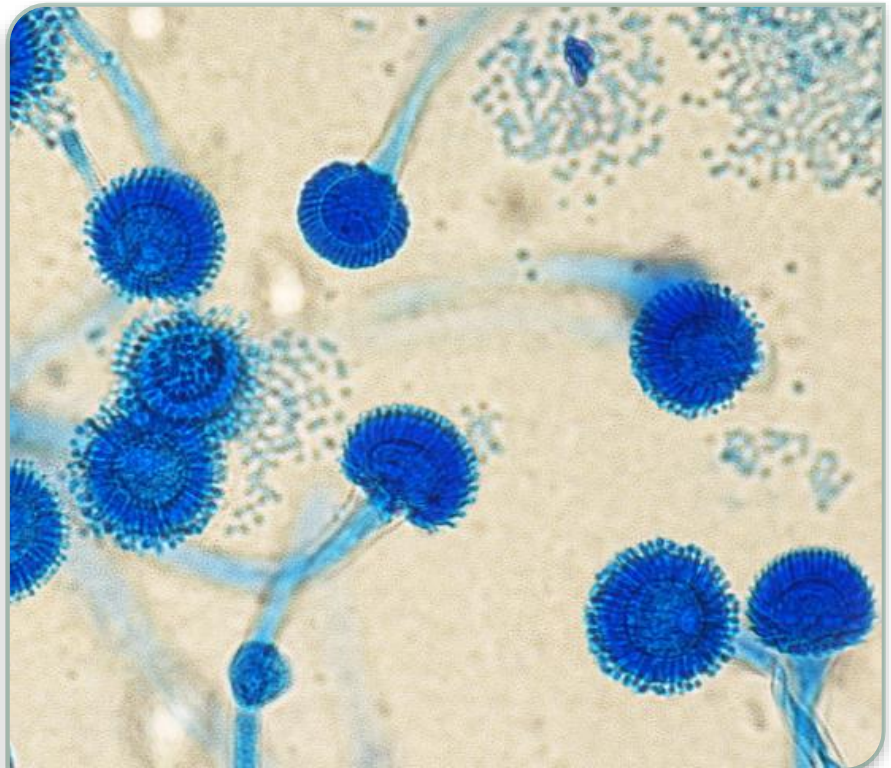
Fungi and transplant

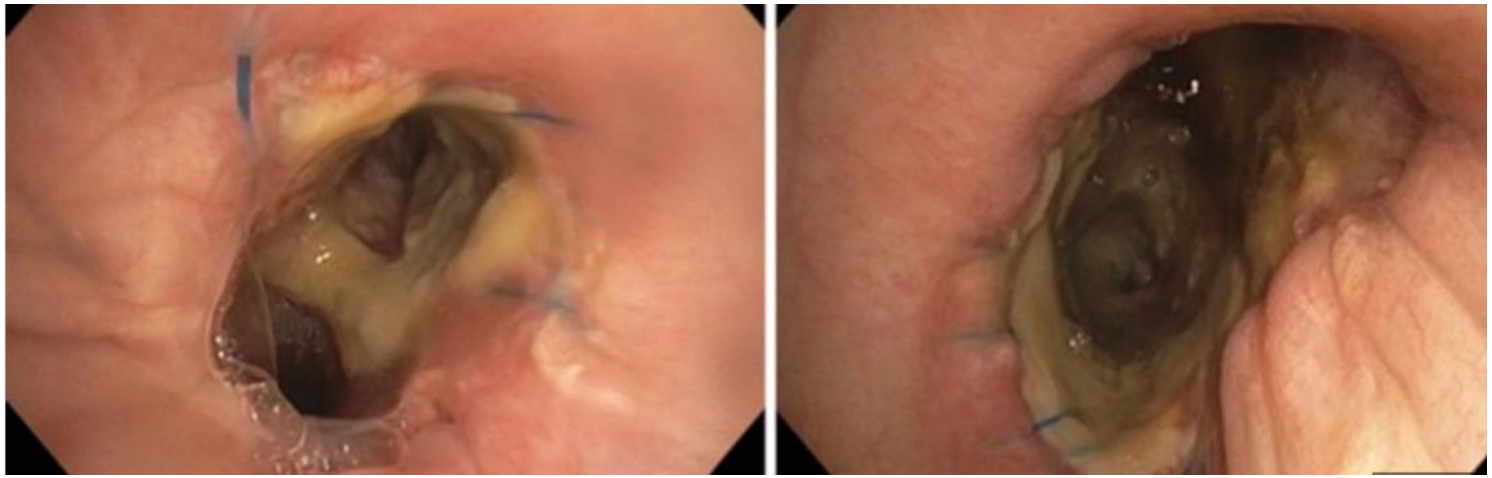
- ***Lung or disseminated (eg. in blood)***

In lungs initially likes to sit on the joins and the sutures

- ***Colonisation***
  - Tx candidates – Pre transplant (eg. CF or bronchiectasis patients for lungs
    - *Aspergillus* spp most common (*A. fumigatus* 59%, *A.flavus* 35%)

- ***Invasive fungal infection post-Tx***
  - Rates 3-14%
  - Why on prophylaxis





Risk factors:

Colonisation before/early after Tx

Acute/chronic rejection

CMV infection

Single lung tx

Airway stents

Diabetes

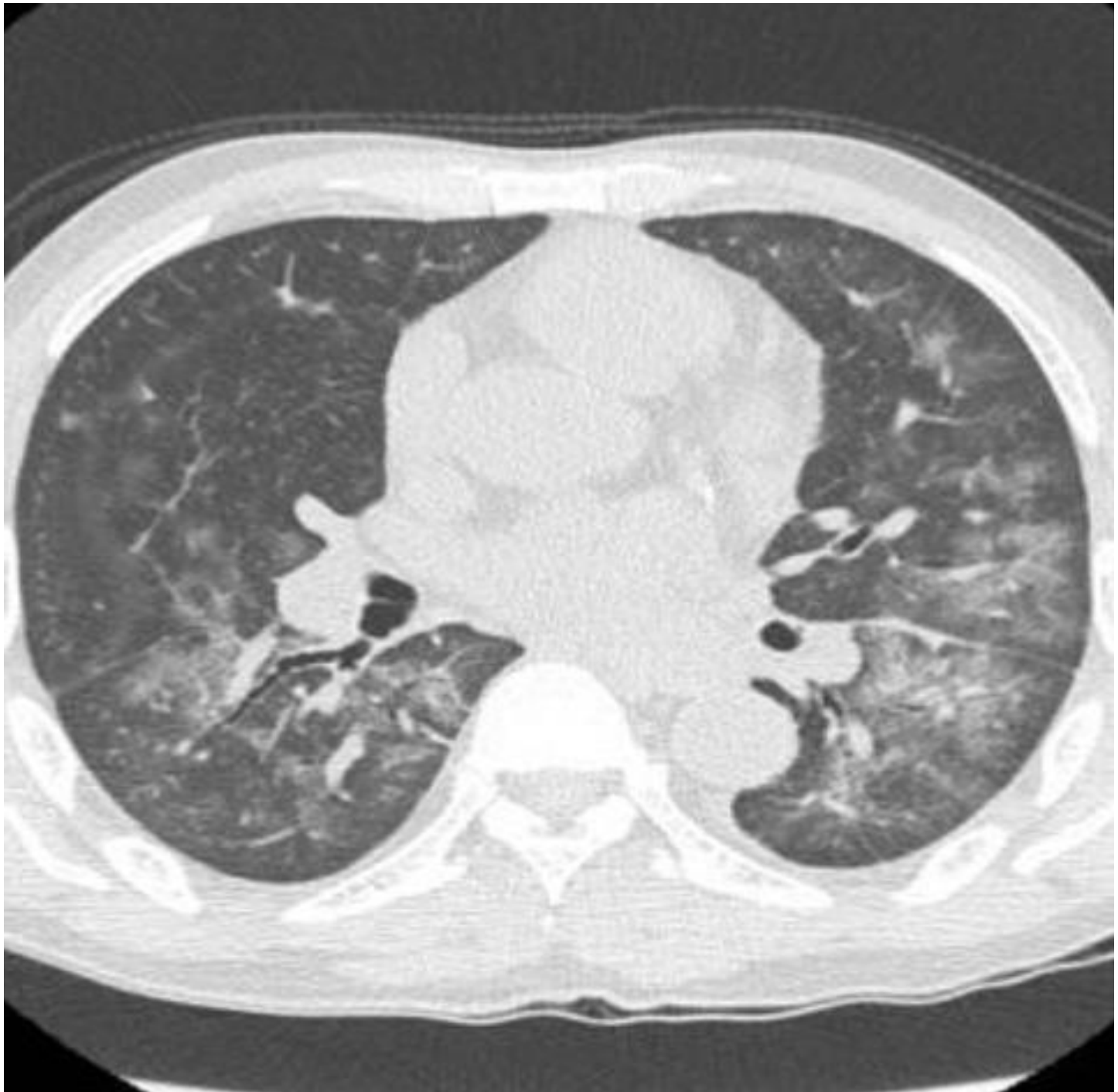
PcP - *Pneumocystis jirovecii*

Pneumocystis jirovecii is a ubiquitous and opportunistic fungus that is localized in the alveoli.

Dyspnoea and/or non-productive cough, drop in LF

Lifelong prophylaxis is required for tx patients.

Agents – most co-trimoxazole.



Mitigating risk

VACCINATION – PNEUMOCOCCAL, COVID, INFLUENZA , SHINGLES, RSV

SENSIBLE IN CROWDED PLACES

ACTIVE

EARLY INTERVENTION/ CONTACT

TAKING PROPHYLAXIS WHERE APPROPRIATE/ SUITABLE

Prophylaxis

Aciclovir, Valganciclovir or Ganciclovir 3 months or 6 in D+/R- CMV, CMV viremia monitored for regularly.

Co-trimoxazole - PCP prophylaxis for life PCP

Azithromycin (also reduces rejection but is a good antibiotic too).

Antifungals – 100 days Nystatin

Vaccinations – influenza, pnemococcal, covid 19