

Yeasts

Dr N. Townell, April 2021

Key website for fungal identification, <https://mycology.adelaide.edu.au/>

Identification of yeast

- Microscopy – wet prep appearance, gram stain (Gram positive), india ink, silver stains
- Culture – fungal media, selective fungal media, temperature – 28 and 35 C are standard temperature conditions (can incubate higher and lower), growth rate – candida grows overnight, others take a few days, all less than 1 week (chromogenic agar)
- Benchside test – urea, germ tube
- Biochemical – vitek card, API
- MALDI-TOF MS
- Molecular – 18s sequencing , ITS

Susceptibility testing

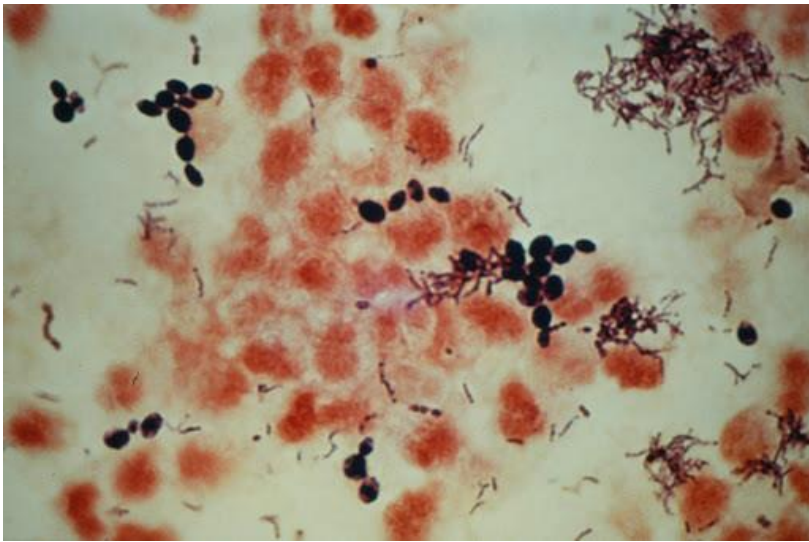
- Candida - vitek 2 AST card
- Cryptococcus – only if prior treatment with azole or treatment failure/relapsed infection
- Gold standard – broth microdilution.

Candida spp – most common. *C. albicans* most common species. Community infection – thrush, complicated infection in IVDU population, candida oesphagitis in HIV +ve pt. Common cause of HAI – most commonly due to longterm lines and parenteral nutrition, other infections: catheter UTi VAP, SSI. Rx fluconazole (unless fluconazole resistant species then use an echinocandin e.g. caspofungin or amphotericin)

C. auris –emerging fungus that presents a serious global health threat associated with nosocomial outbreaks (despite enhanced Infection control measures), difficult to identify in the laboratory using standard methods (resulting in misidentification when using biochemical methods), often multidrug resistant (including development of resistance following antifungal exposure). <https://cmr.asm.org/content/cm/31/1/e00029-17.full.pdf>



Presence of feet -> *candida albicans* (or *c. dublinensis*)

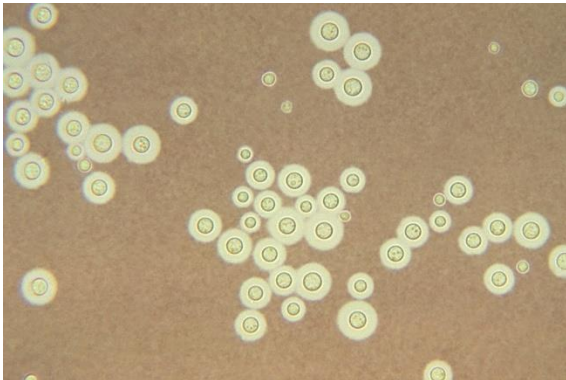


Oval yeast -> *Candida*. Much bigger than bacteria

<http://www.life-worldwide.org/media-centre/article/resistance-amr-in-candida-glabrata-reaching-epic-proportions/>

Cryptococcus – *C. neoformans*: predominantly associated with HIV infection - meningitis (and BSI). Diagnosis – BC and CSF culture, cryptococcal antigen (blood and CSF)

(Immunocompetent hosts can be infected with *Cryptococcus gattii* (different species), endemic in soil in Australia, but increasingly reported in other continents).



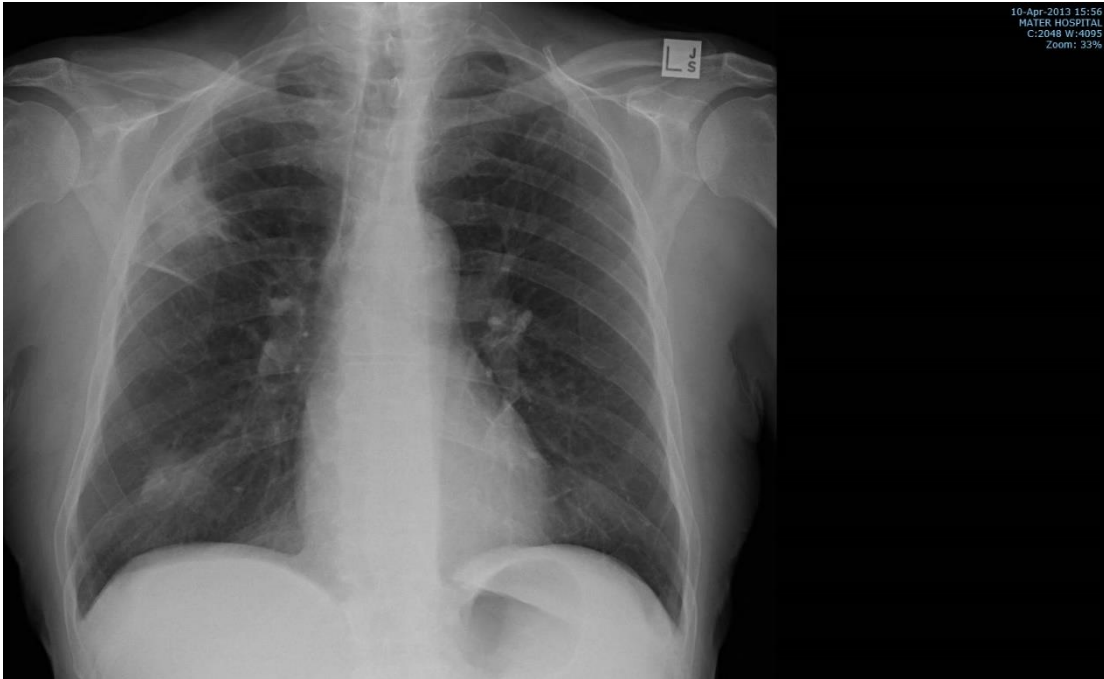
India ink – encapsulated round yeast

<https://en.wikipedia.org/wiki/Cryptococcus>

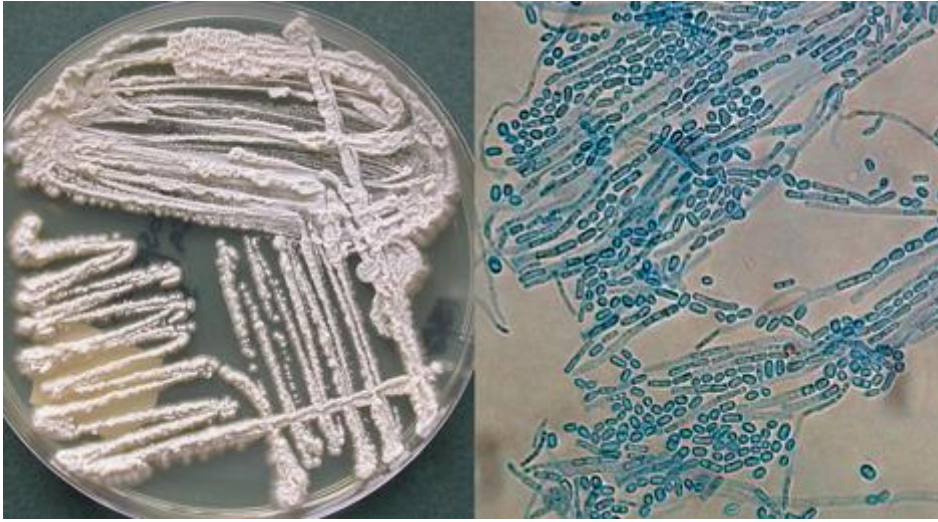


https://www.researchgate.net/figure/Cryptococcus-colonies-on-blood-agar-medium_fig2_264866593

Cryptococcal pneumonia – CXR: lesion in periphery of RUL, CT: cavitating lung lesions (Images courtesy of John Ferguson)



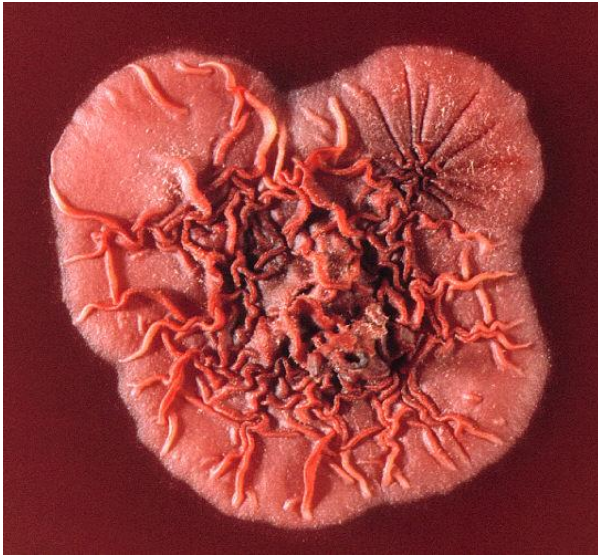
Trichosporon – complicated urinary tract infections, disseminated inf in immunocompromised hosts



White chalky dry colony, slower growing

Image: Mycology Online

Talaromyces (previously *Penicillium*) **marneffe**i – disseminated infection in HIV patients, multiple organs involvement – commonly skin and lung. well recognised to cause infection in SEA



Pink wrinkled dry colony

Image: Wikipedia

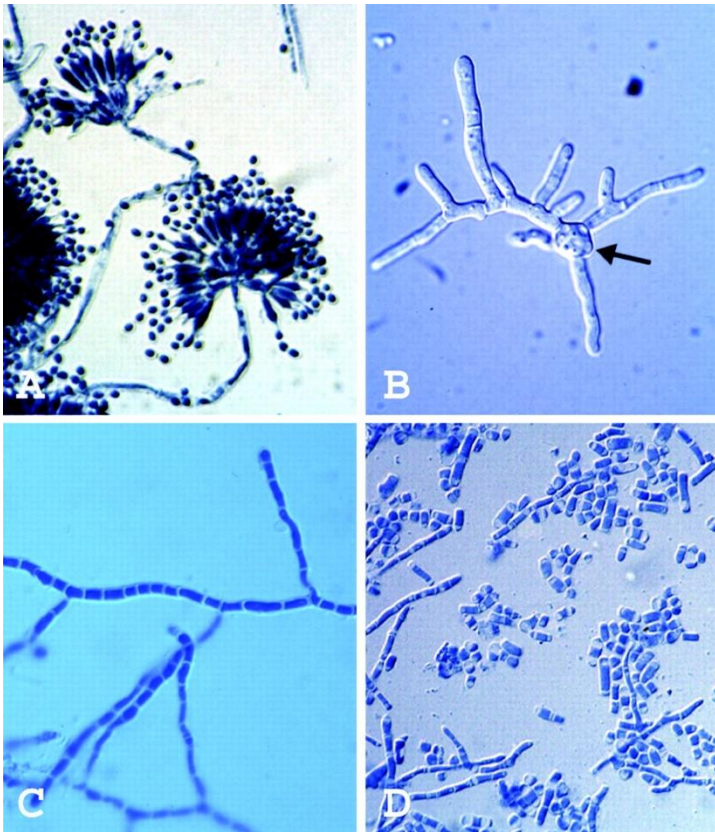
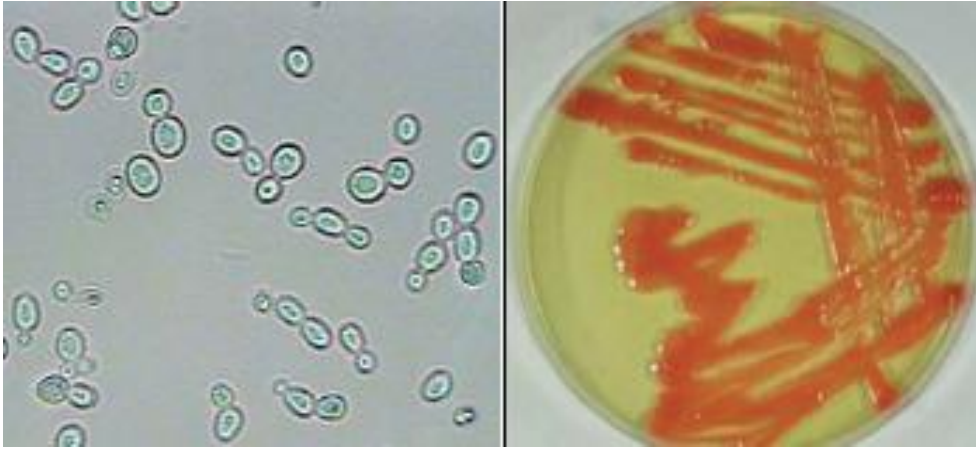


Image: <https://cmr.asm.org/content/19/1/95>

Rhodotorula – complicated urinary tract infections

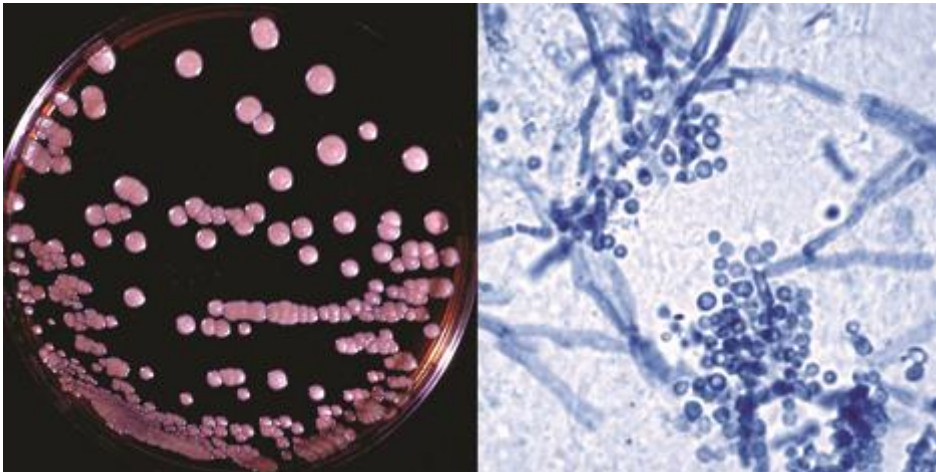


Pink pigmented yeast

Image: https://www.researchgate.net/figure/Microscopic-image-and-streak-plate-of-Rhodotorula-glutinis_fig1_221916007

Malassezia – causes superficial skin disease e.g. seborrheic dermatitis, pityriasis versicolor

Identification – microscopy, (can be cultured but requires addition of oil to plates.)



"Spaghetti and meatball" appearance on microscopy

Mycology online



Image: Dermnet.nz

Pneumocystis jirovecii – “yeast like fungi”, lung infection in HIV patients – sub acute presentation dry cough and dyspnoea. Hallmarks – Exercise desaturations and marked hypoxia. Also immunosuppressed patients on steroids and monoclonal antibodies – e.g. transplant, cancer. Presents more acutely in non-HIV immunosuppressed patients, high mortality. Diagnosis: clinical, induced sputum. Non-culturable (cell line culture only). Detection by microscopy (silver stain or IFA) or NAAT

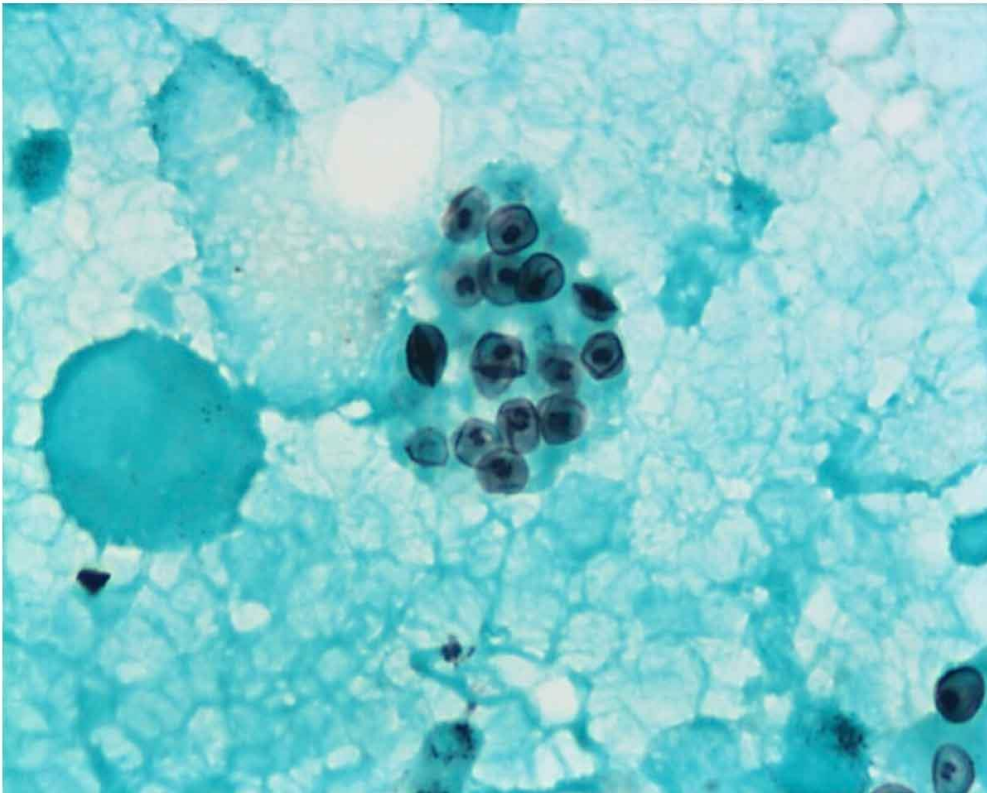


Fig. 2. Microscopic image of black *Pneumocystis jirovecii* cysts of 5–6 μm in a bronchoalveolar lavage fluid cell pellet after centrifugation. Grocott-Gomori methenamine silver staining, $\times 1,000$.

Salzer HJF et al. 29635251

Image: <https://emcrit.org/ibcc/pjp/>

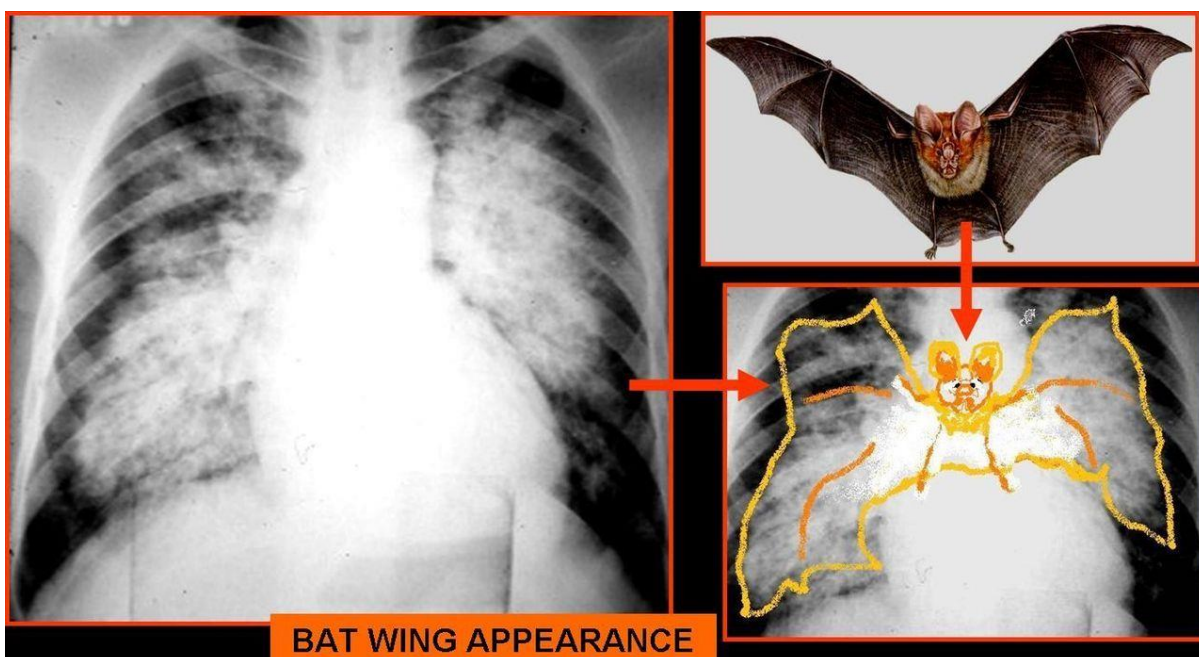
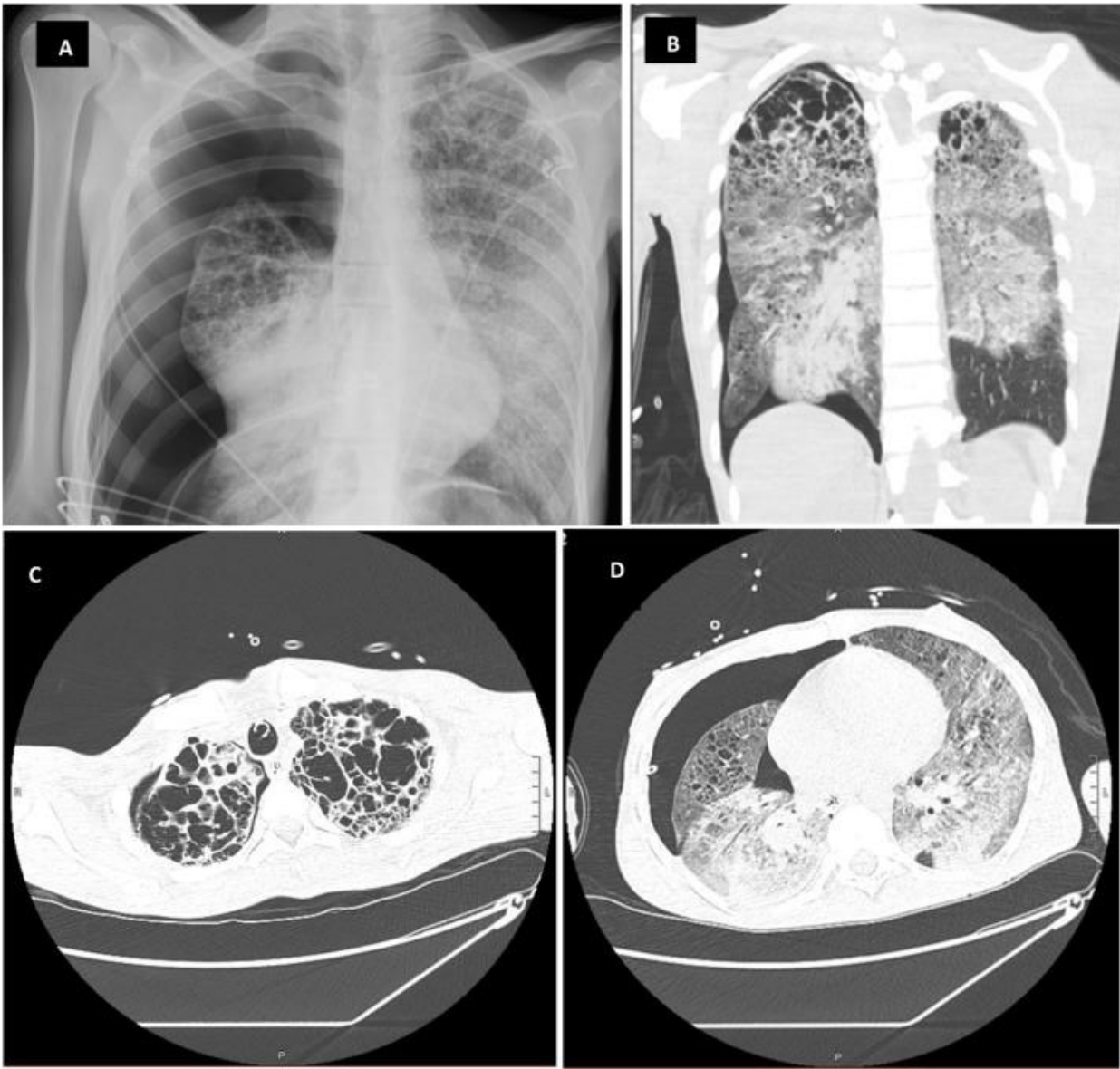


Image: <https://mcatmemoranda.tumblr.com/post/179059573801/bats-wing-or-butterfly-pulmonary-opacities-refer>



Complication - right lung pneumothorax

Image: [https://www.ijidonline.com/article/S1201-9712\(20\)30615-9/fulltext](https://www.ijidonline.com/article/S1201-9712(20)30615-9/fulltext)

Another PJP case – “normal” looking CXR, ground glass changes on CT (images courtesy of John Ferguson)

