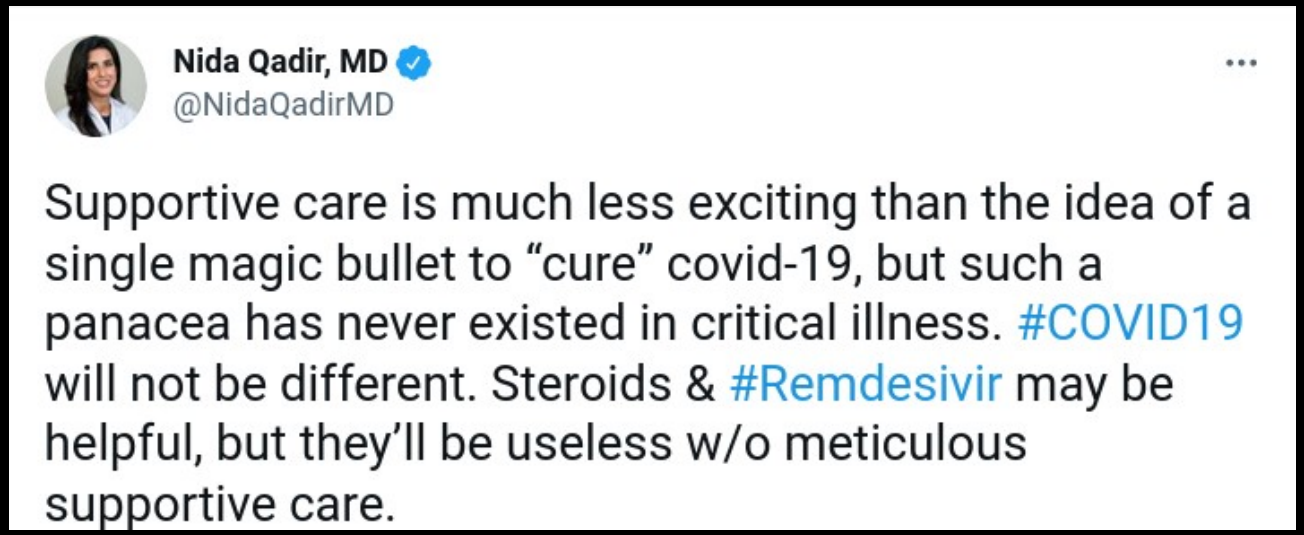
流感等呼吸道病毒重症照護

謝宗達
成大醫院 重症加護科 / 感染管制中心
Sep 05, 2025

I have no conflict of interest.

重症照護就是嚴謹的支持性治療



https://twitter.com/NidaQadirMD/status/1287443875167051776

- 密切監測
  - 心律 / 血壓 / 血氧
  - 動脈導管 / 心輸出
  - 隨時有人看
- 器官支持
  - 氧氣 / 呼吸器 / 俯臥
  - 升壓劑 / 強心劑
  - IABP / ECMO
  - 腎臟替代療法

呼吸道病毒感染的症狀

- Respiratory symptoms
  - Cough
  - Sputum production
  - Nasal discharge
  - Sore throat
- Other symptoms
  - Photophobia
  - Conjunctivitis
  - Anosmia (COVID-19)
- Systemic symptoms
  - Fever / chills
  - Headache
  - Myalgia
  - Malaise / anorexia
  - Dyspnea
  - Altered mental status

Paules C. *Lancet*. 2017;390:697-708.
https://www.cdc.gov/flu/about/qa/coldflu.htm
新型冠狀病毒 (SARS-CoV-2) 感染臨床處置指引．第 29 版 . 2025-05-15.

呼吸道病毒的診斷工具

TABLE 3 Sensitivity of respiratory viral detection from different specimen types[a]

Specimen type	Sensitivity of detection[b] of:						
	FLUA/B[c]	RSV	RV/EV	ADV	hMPV	PIVs	CoVs[c]
NPS	++	++	++	++	++	+++	++
NPA	+++	+++	+++	+++	+++	+++	+++
OPS	++(+)[d]	++	+	++	+	+	+
TS	++	++	+	++	+	++	++
Sputum[f]	+++	+++	+++	+++	++	+(+)	++(+)[e]
BAL fluid	+++	+++	++	++	++	+(+)	++
Lung biopsy specimen	++	++	+	+	+	o	+++

- Nucleic acid detection
- DFA/IFA assays
- Rapid antigen tests
- Cell culture

Rapid antigen test 敏感度 60-90%，
如陰性但臨床有仍有懷疑請驗核酸。

Charlton CL. *Clin Microbiol Rev*. 2018;32(1):e00042-18.

只採檢鼻咽或下呼吸道
會漏掉 20-30% 的呼吸道病毒感染

TABLE 2. Site of Virus Detection

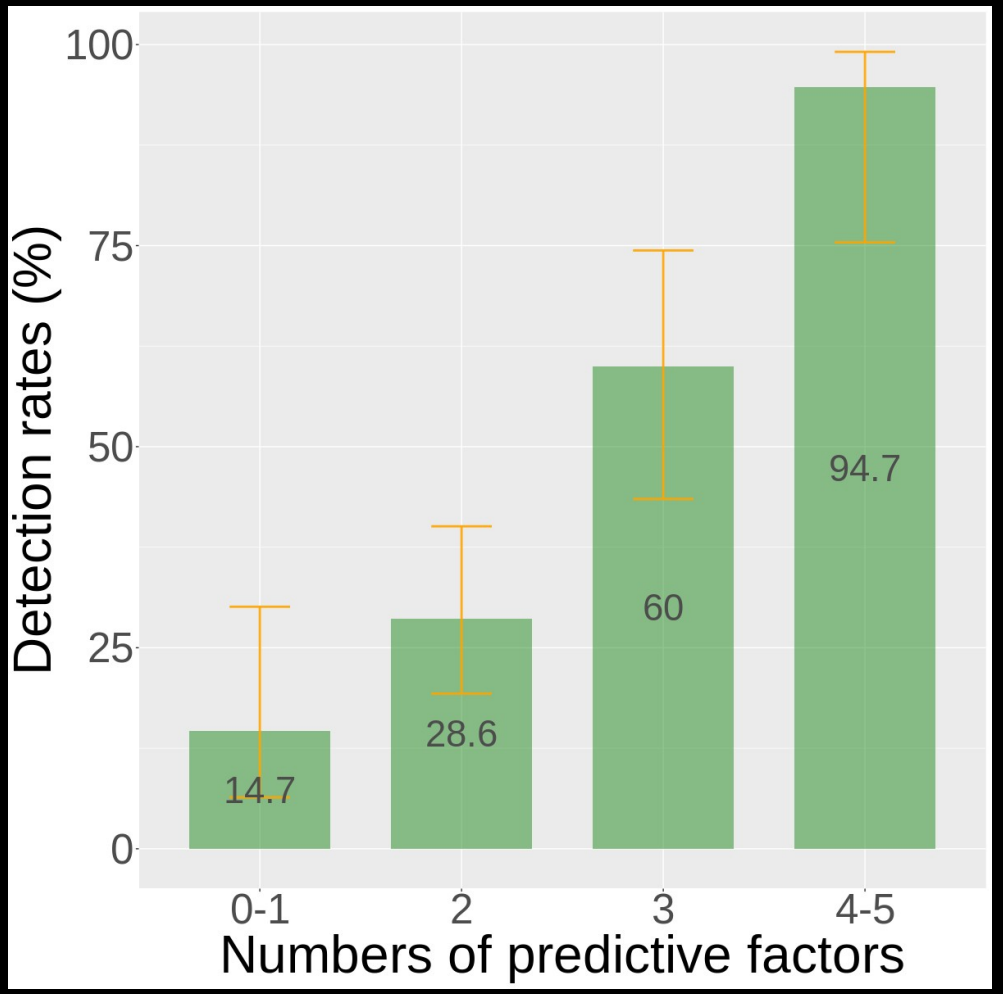
Site of Virus Detection	SARI, *n* = 45 (%)	Non-SARI, *n* = 213 (%)
Nasopharyngeal swab	32 (71)	133 (62)
TA	36 (80)	136 (64)
Exclusive nasopharyngeal	9 (20)	77 (36)
Both nasopharyngeal/TA	23 (51)	56 (26)
Exclusive TA	13 (29)	80 (38)

SARI = severe acute respiratory infection (at ICU admission), TA = tracheobronchial aspirate.

van Someren Gréve. *Crit Care Med*. 2018;46(1):29-36.

哪些重症病人比較驗得到呼吸道病毒？

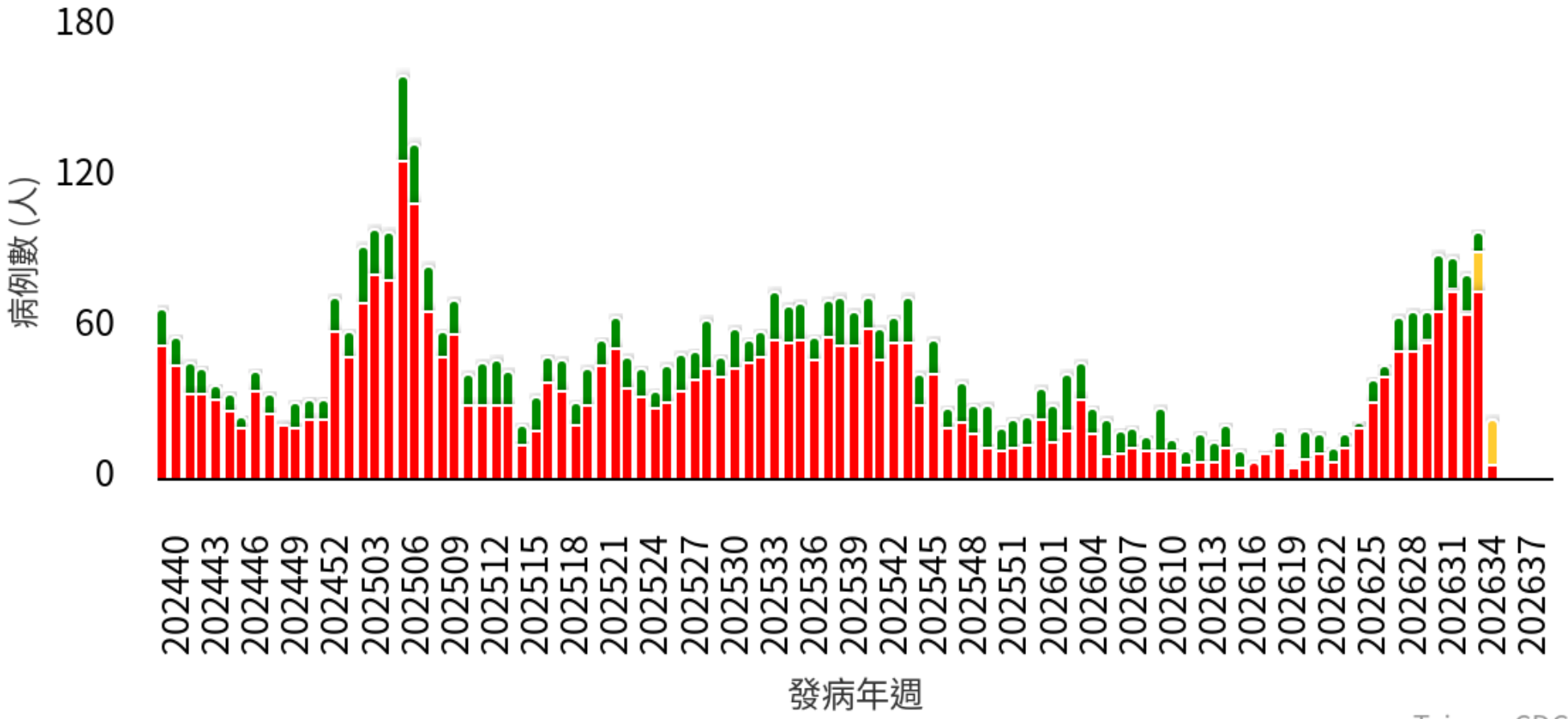
Predictive factor	Odds Ratio
Age < 65 years	3.98
Clustered URI	3.93
Fever	2.89
Cough and sputum production	3.24
Sore throat	3.70



Cia CT. *Sci Rep*. 2021;11(1):20058.

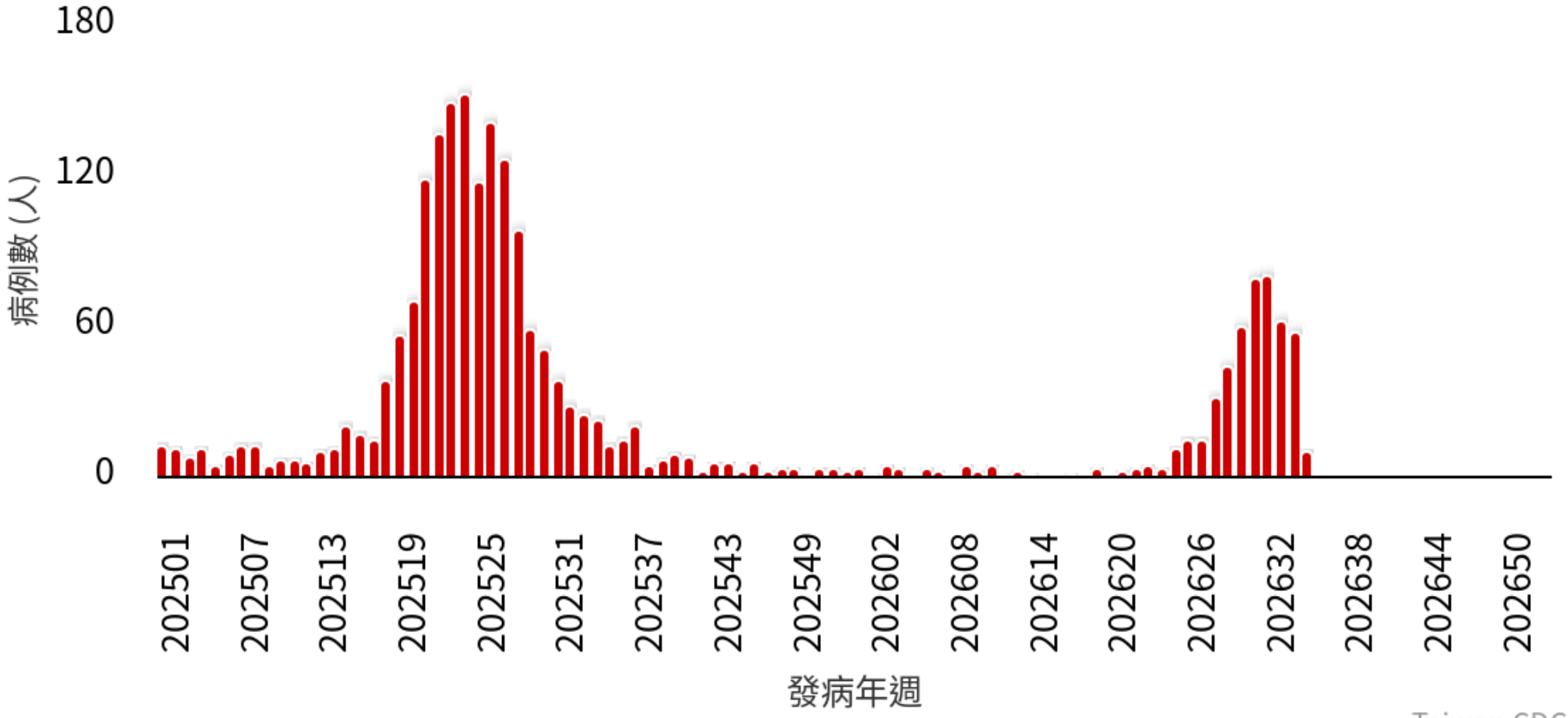
感染症：流行什麼很重要

流感重症 2024.09-2026.08



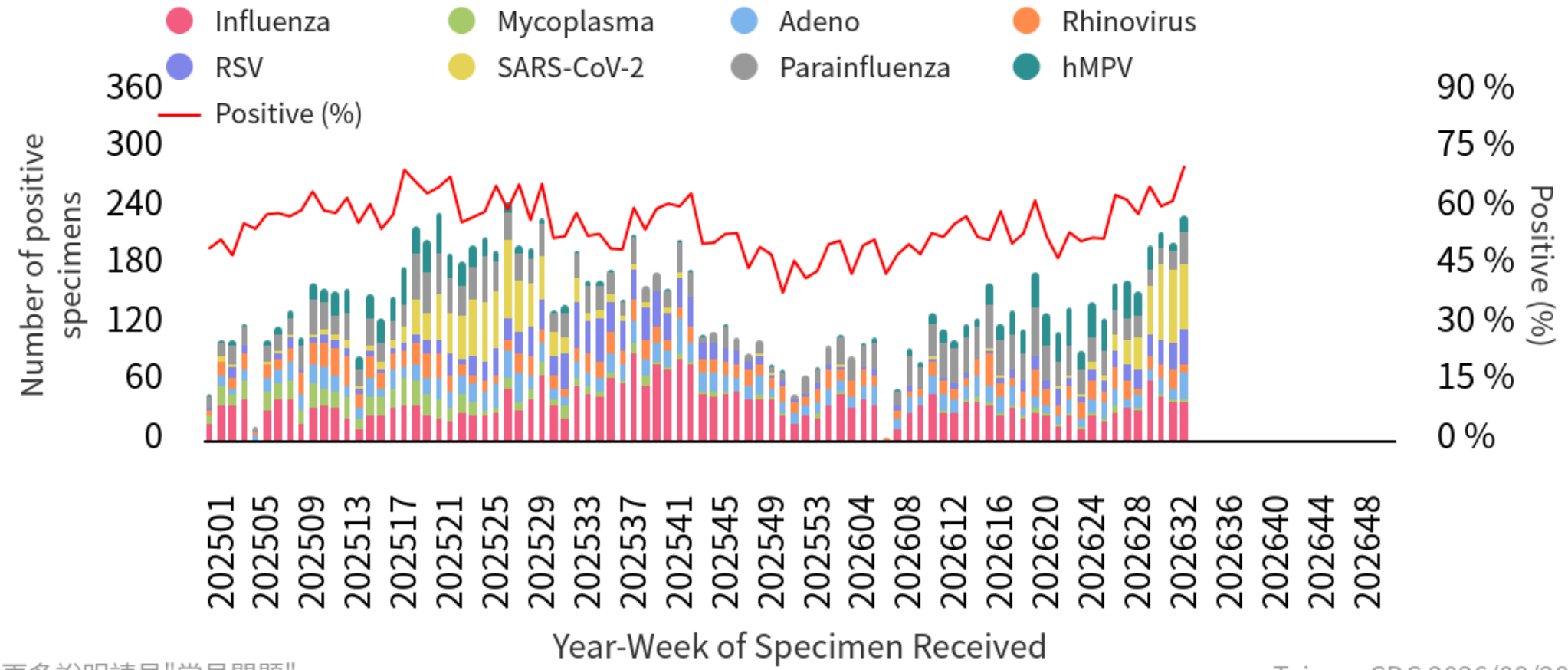
Taiwan CDC 2026

COVID-19 重症 2024.09-2026.08



https://nidss.cdc.gov.tw/

每週呼吸道檢體病原分子生物學檢出



更多說明請見"常見問題"

Taiwan CDC 2026/08/28

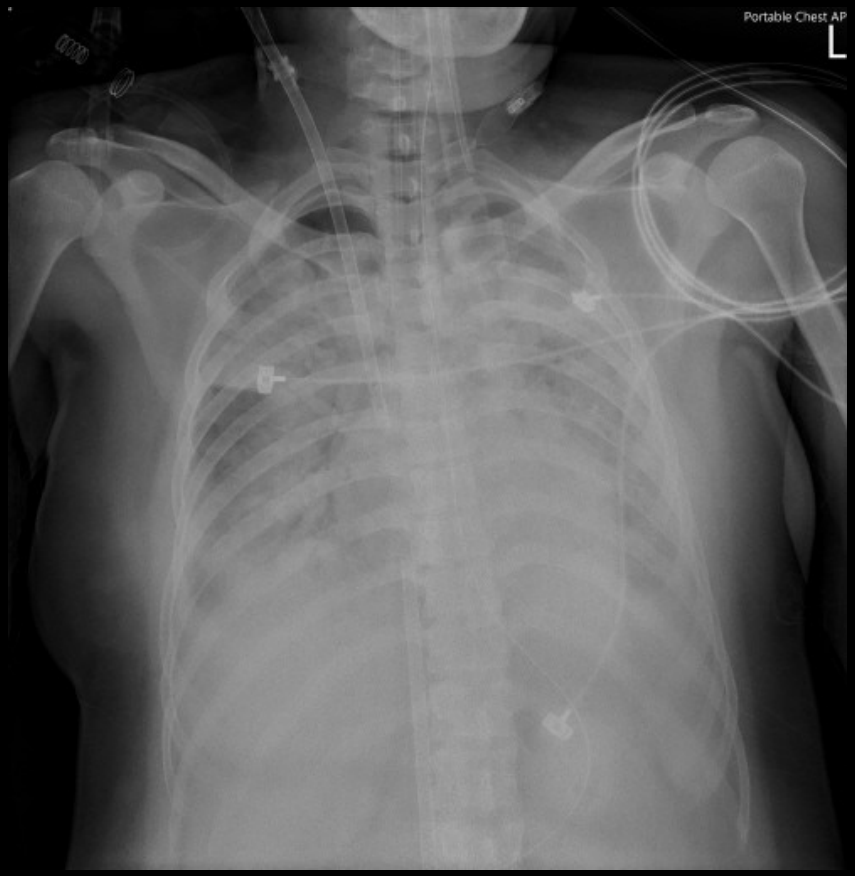
流感併發重症

Severe influenza in Taiwan, 2016

Taiwan Severe Influenza Research Consortium

- 336 patients admitted to ICUs in 8 hospitals
  - Age 61.4 y; Male 62.8%
  - IMV 288 (85.7%); ARDS in 263; ECMO in 50 pts
- Mortality ~ 18.6%
- Predictors of better survival
  - negative day 1-4 cumulative fluid balance
- Associated with worse survival
  - high driving pressure; high tidal volume
  - Earlier treatment and higher dose corticosteroid

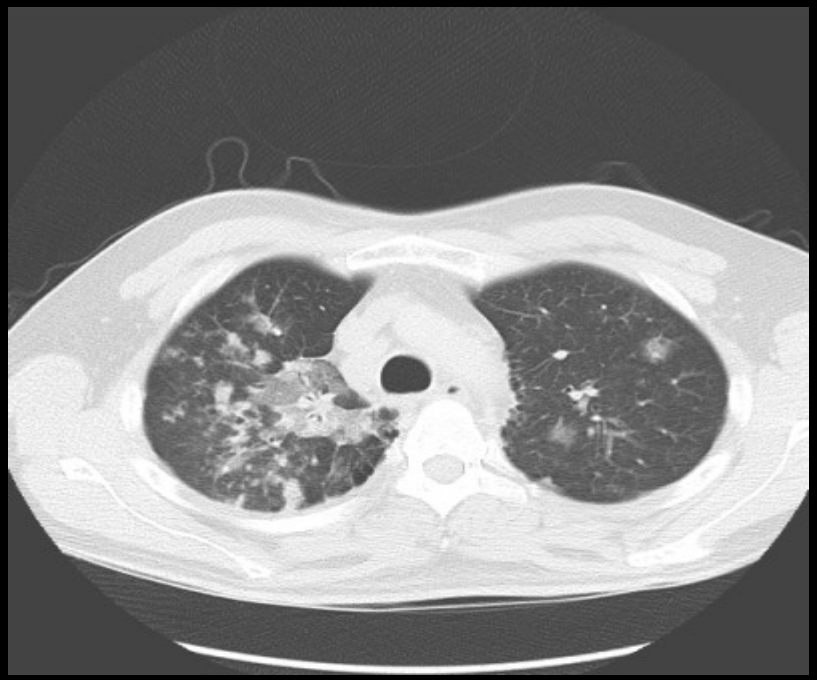
Chao WC. *PLoS One*. 2018;13(1):e0190952.
Chan MC. *J Formos Med Assoc*. 2019;118:378-385.
Tsai MJ. *Ann Intensive Care*. 2020;10(1):26.
Kao KC. *Ann Intensive Care*. 2018;8(1):94.

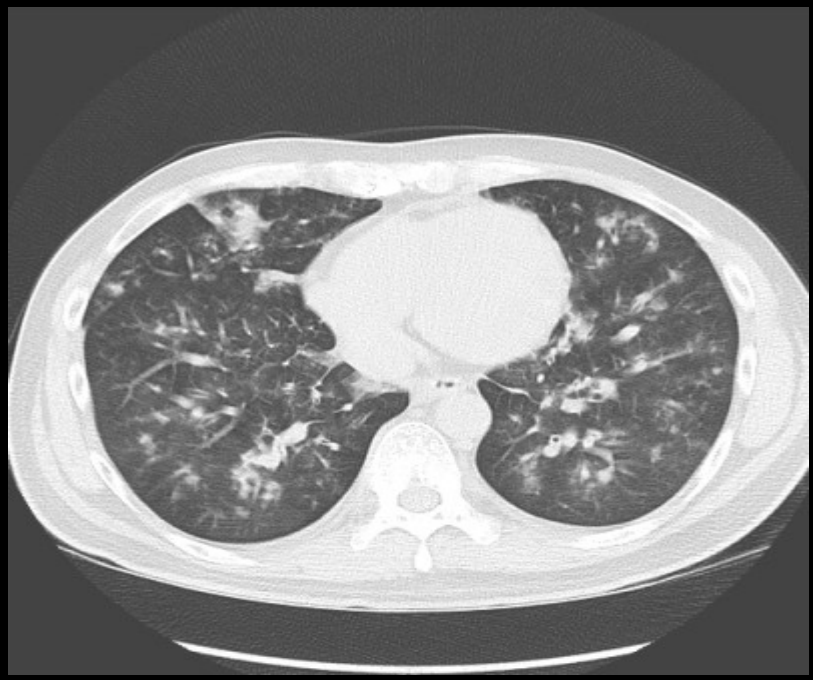


42 F. no known chronic disease.
Productive cough and rhinorrhea for one week.
Fever and chills for 4 days.
Severe Influenza A (H1). 快篩陰性！
Severe ARDS. s/p V-V ECMO



66 M. DM. HTN.
Dry cough, rhinorrhea, sore throat for one week.
Severe Influenza A (H1). 快篩陰性！
Severe ARDS. Prone positioning





32 M. No chronic disease
Fever, productive cough. Dyspnea for 3 days
Severe Influenza B. 快篩陰性！
ARDS. Aspergillosis. VAP. V-V ECMO. Expired.

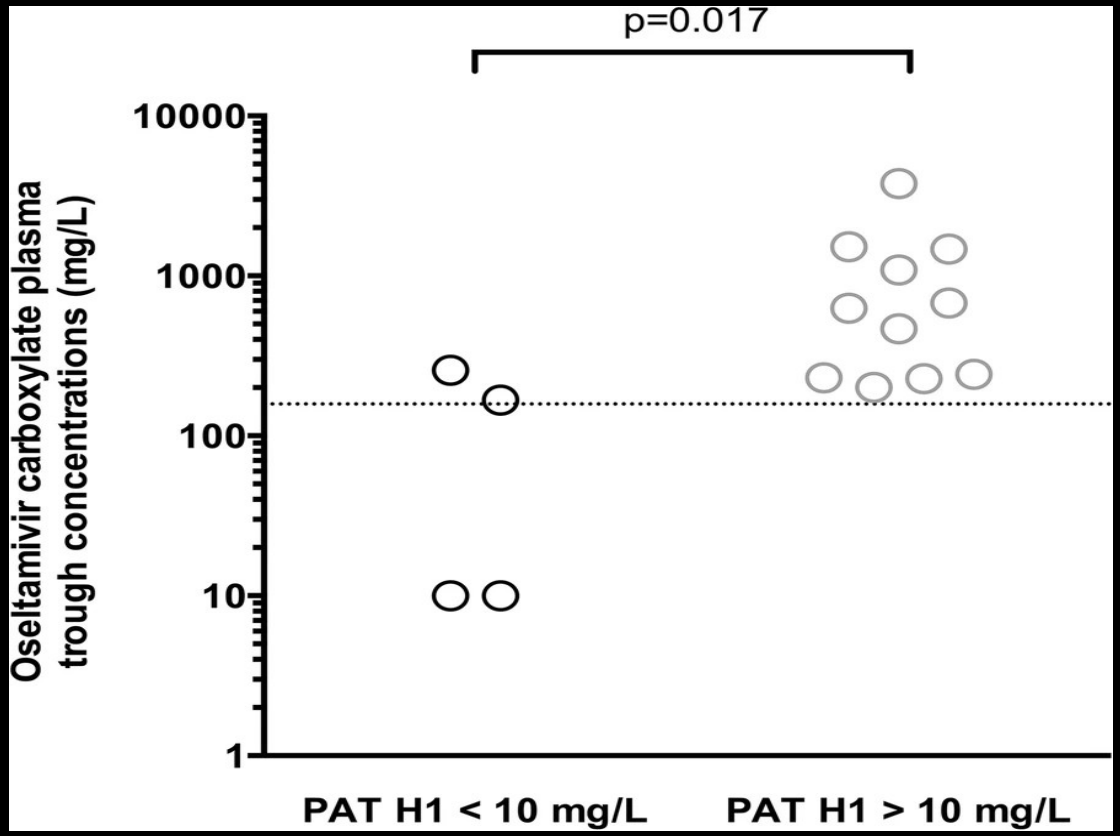
Influenza 重症病人處置

流感重症病人使用抗病毒藥物

- 首選：口服 osetlmamivir
  - 資料最多，但 2026 之前無 v.s. placebo 的 RCT)
  - meta-analysis 顯示住院及重症病人死亡率下降
    OR 0.81 (0.70-0.93) 及 0.72 (0.56-0.94)
  - 多數重症病人腸道吸收血中藥物濃度和一般病人接近
- 消化功能明顯不良的病人： permamivir (IV)
  - 療效和副作用與口服 oseltamivir 無差異

Muthuri SG. *Lancet Respir Med*. 2014;2(5):395-404.
Ariano RE. *CMAJ*. 2010;182(4):357-63.
Nakamura S. *Open Forum Infect Dis*. 2017;4(3):ofx129.

用 acetaminophen 來測 oseltamivir 吸收效果



口服 acetaminophen 一小時候抽血中濃度超過 10 mg/L

oseltamivir 血中濃度就會達到治療標準

May F. *Intensive Care Med*. 2019;45(10):1484-1486.

REMAP-CAP Oseltamivir
Futile and possibly harmful?

Table 2. Primary outcome and sensitivity analyses

	All patients randomised to oseltamivir or no antiviral		
	5 days of oseltamivir (n=162)	**10 days of oseltamivir (n=156)**	**No antiviral (n=124)**
90-day Mortality - n (%)	32/162 (19·8)	30/155 (19·4)	17/124 (13·7)
Primary Analysis			
Median Adjusted Odds Ratio (95% CrI)	2·13 (1·03 – 4·52)	2·17 (1·05 – 4·64)	REF
Adjusted Risk Difference (percentage points) [a]	11·6 (0·4 - 28·1)	11·9 (0·6 - 28·7)	REF
Probability of futility (OR>0·83) (%)	99·5	99·5	-
Probability of harm (OR>1) (%)	98·3	98·9	-
Probability of efficacy (OR >1) (%)	1·7	1·1	-
Probability of equivalence (OR between 0·83 and 1·2) [b]	41·8		-
Pooled Treatment effects			
Median Adjusted Odds Ratio (95% CrI)	1·92 (1·00 – 3·81)		REF
Adjusted Risk Difference (percentage points) [a]	9·7 (0·0 - 24·0)		REF
Probability of futility (OR>0·83) (%)	99·4		-
Probability of harm (OR>1) (%)	97·4		-
Probability of efficacy (OR >1) (%)	2·6		-

Murthy S, et al. http://dx.doi.org/10.2139/ssrn.7172531

No routine corticosteroid use for critically ill patients with influenza

- IDSA guideline 2018: Clinicians should not administer corticosteroid adjunctive therapy for the treatment of adults or children with suspected or confirmed seasonal influenza, influenza-associated pneumonia, respiratory failure, or ARDS, unless clinically indicated for other reasons (A-III).
- No RCT, but nearly all observational study show possible harm.

Chow EJ. *Crit Care*. 2019;23(1):214.
Lansbury L. *Cochrane Database Syst Rev*. 2019;2(2):CD010406.
Tsai MJ. *Ann Intensive Care*. 2020;10(1):26.

Bacterial co-infections in influenza

- 0.5% in young healthy individuals
- At least 2.5% in older individuals and those with predisposing conditions
- 34% of ICU patients

- High risk patients
  - Age ≥ 65 y or < 5 y
  - Pregnant woman
  - Morbid obesity
  - Pre-existing medical conditions

Metersky ML. *Int J Infect Dis*. 2012;16(5):e321-31.
Chertow DS. *JAMA*. 2013;309(3):275-82.
Rouzé A. *Am J Respir Crit Care Med*. 2021;204(5):546-556.



Co-pathogens in the US

- 2003-04
  - 959 adults with influenza
  - 125 needed intubation
  - 97 with co-infection
    - *S. aureus* 31
      MRSA 24
    - *S. pneumoniae* 16
    - *S. pyogenes* 2
    - Other 4
- 2009-10
  - Bacterial infection in 13 – 55% fatal cases
  - 77 lung tissue specimens
    - *S. pneumoniae* 10
    - *S. aureus* 7
      MRSA 5
    - *S. pyogenes* 6
    - *S. mitis* 2
    - Other 5

Metersky ML. *Int J Infect Dis*. 2012;16(5):e321-31.

Co-pathogens in Spainish ICUs

- 2009 – 2015, 184 ICUs in Spain, 2901 patients
- Patients with co-infections: 482 (16.6%)

Streptococcus pneumoniae	246	51.0%
Pseudomonas aeruginosa	55	11.4%
MSSA	42	8.7%
Aspergillus spp	35	7.2%
Haemophilus influenzae	17	3.5%
Acinetobacter baumannii	14	2.9%
MRSA	12	2.4%
Klebsiella pneumoniae	12	2.4%

Martin-Loeches I. *Intensive Care Med*. 2017;43(1):48-58.

Co-infections in Taiwan

- 7 centers, 2016/01 – 03: 39%
  - Methicillin-sensitive *Staphylococcus aureus* 12

- Chi-Mei H 2015/01 – 2016/03: 31% within 48h
  - *Klebsiella pneumoniae* 14
  - *Staphylococcus aureus* 12 (MRSA: 9)
  - *Pseudomonas aeruginosa* 12
  - *Aspergillus* spp 21 (beyond 48 h)

Chen WC. *Am J Respir Crit Care Med*. 2017;195:A6066.
Ku YH. *J Formos Med Assoc*. 2017;116(9):660-670.

Co-infections at NCKUH

- NCKUH 2017/01 – 2018/06: 43% within 7 days.

Klebsiella pneumoniae	12
Staphylococcus aureus	8 (MRSA: 4)
Aspergillus spp	8
Pseudomonas aeruginosa	5

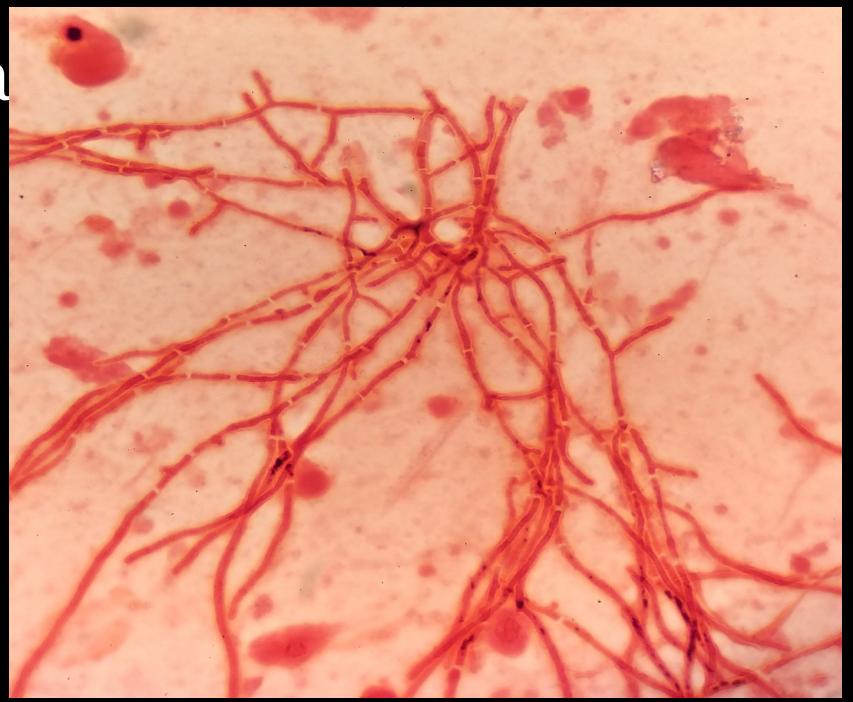
- NCKUH 2023/04 – 2025/06: 37% within 7 days.

Aspergillus spp	15
Staphylococcus aureus	12 (MRSA: 6)
Klebsiella pneumoniae	11
Pseudomonas aeruginosa	8

CT Cia. Unpublished data.

Influenza-associated pulmonary aspergillosis

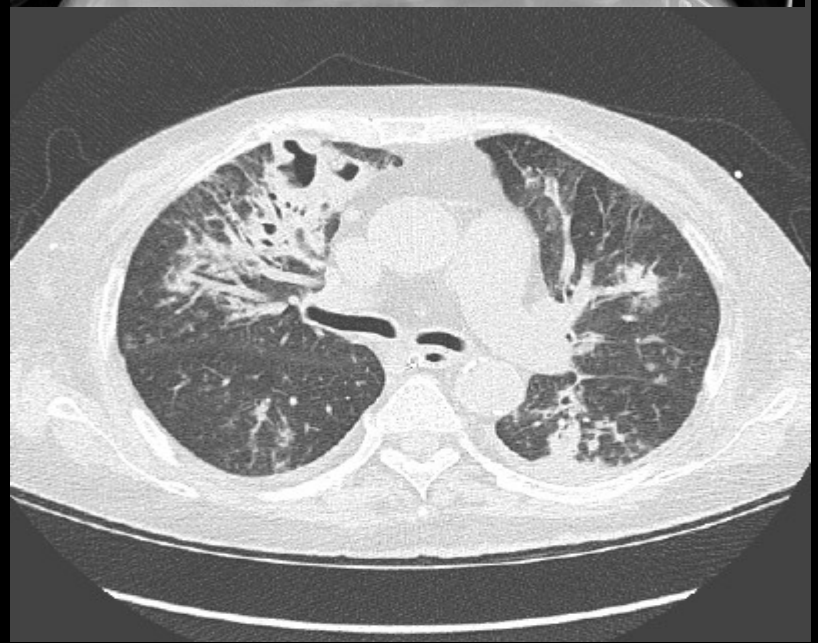
- Prevalence 5-19% among critically ill patients with influenza
- Short interval from diagnosis of influenza to pulmonary aspergillosis
  - Prophylaxis not practicable
- Risk factors: malignancy, compromised immunity
- Associated with high mortality: 49-61%



endotracheal aspirate, Gram stain. 1,000x

Wu CJ. *J Fungi* (Basel). 2022;8(1):49.
Vanderbeke L. *Intensive Care Med*. 2021;47(6):674-686.
Feys S. *Lancet Respir Med*. 2024;12(9):728-742.





- 76-year-old woman
- ESRD s/p kidney transplantation, DM
- Influenza A (H1)

- Concurrent infections
  - *Staphylococcus aureus*
  - *Klebsiella pneumoniae*
  - *Aspergillus tereus* complex
  - *Cunninghamella* spp.
  - Cytomegalovirus

有肺炎的流感重症病人
建議經驗性抗生素需涵蓋

Methicillin-sensitive *Staphylococcus aureus*

Streptococcus pneuomniae

Klebsiella pneumoniae

重症病人亦需考慮，應努力尋找相關證據

MRSA, *P. aeruginosa*, *Aspergillus* spp

Extrapulmoary complications of influenza

- Cardiac
  - Myocarditis and cardiomyopathy
  - Heart failure
  - Pericadial effusion
  - Myopericarditis
  - Arrythmia
- Neurologic
  - Encephalopathy, encephalitis, meningitis
  - Seizure
  - Guillains–Barre syndrome
- Other
  - Rhabdomyolysis
  - Acute kidney injury
  - Miscellaneous

Sarda C. *Curr Opin Crit Care*. 2019;25(5):449-457.

COVID-19 重症

First, confirm the diagnosis.
A positive Ag test should be confirmed by nucleic acid tests.

NCKUH ICUs, 2026

Ag+ / NAAT-: 4; Ag-/NAAT+: 1

Critical COVID-19 (before Omicron)

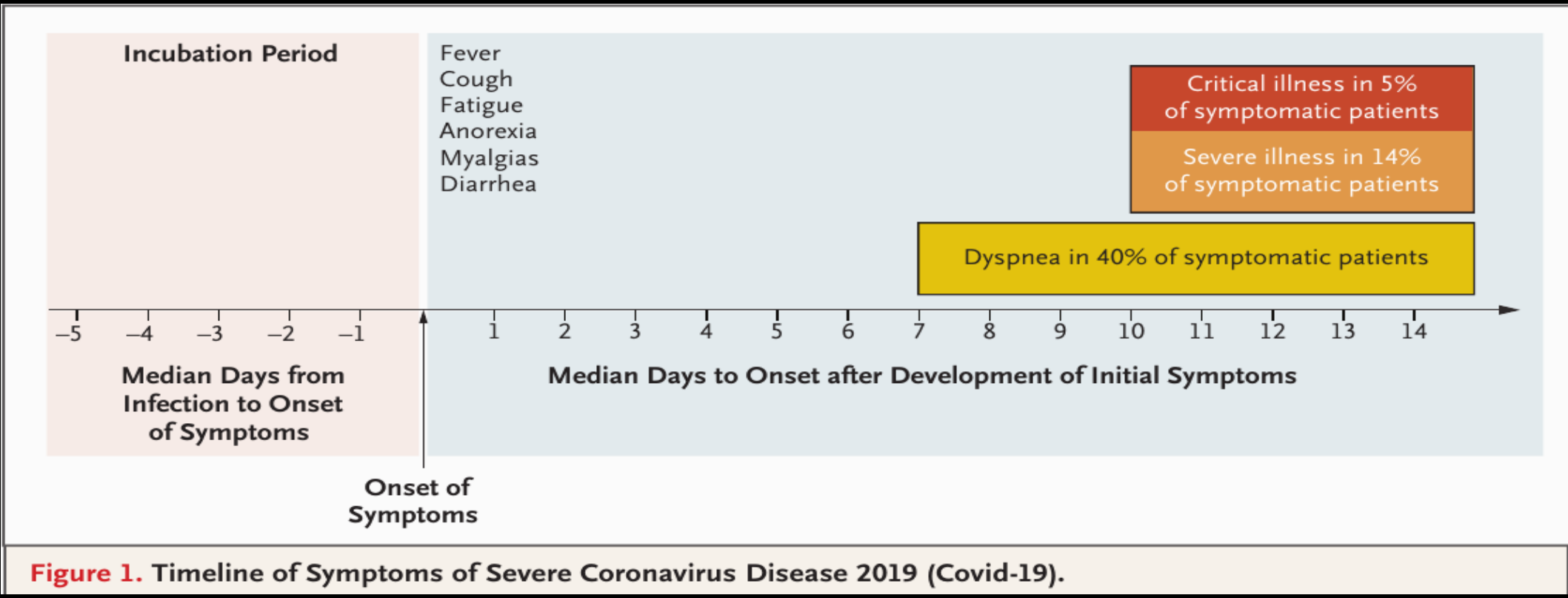
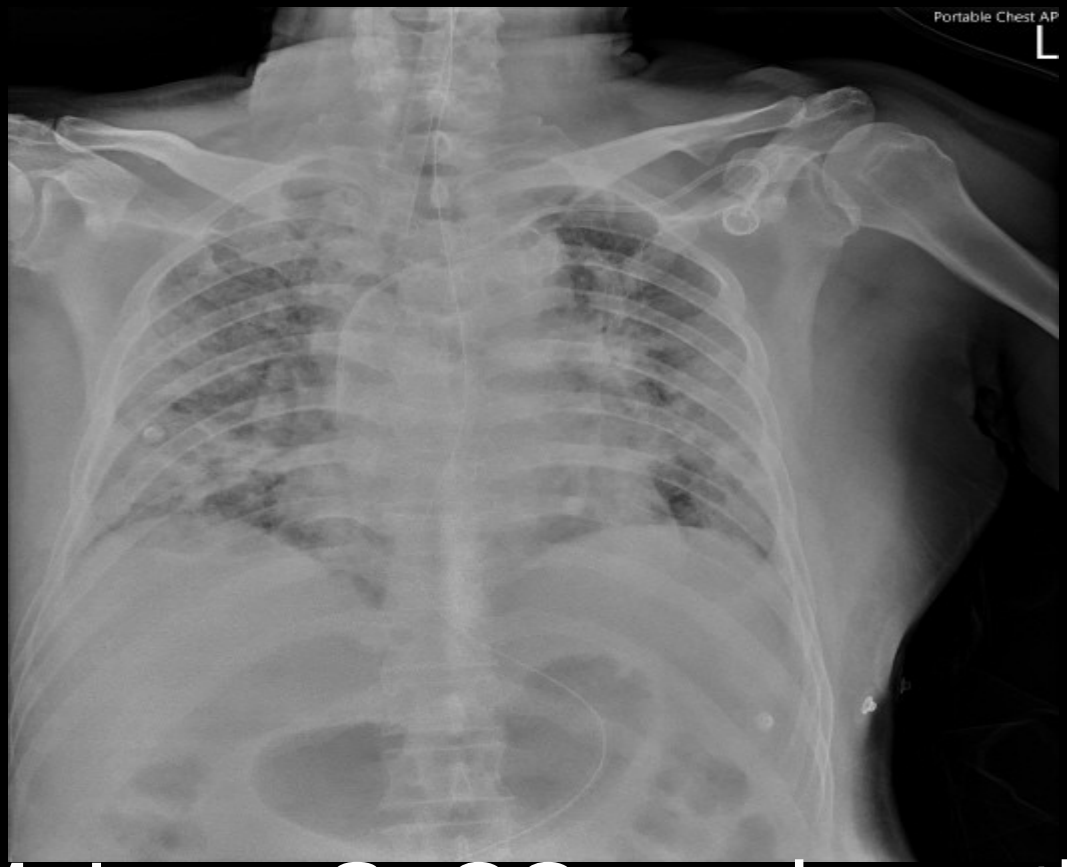


Figure 1. Timeline of Symptoms of Severe Coronavirus Disease 2019 (Covid-19).

~10 days after symptom onset

Inflammation >> viral replication

Berlin DA. *N Engl J Med*. 2020;383(25):2451-2460.



69 y/o M. Lung SqCC on chemotherapy.
DM. CKD. HTN. Independent ADL.
COVID-19 Ag+ on 7/20. Cough with sputum
Dyspnea 7/29-. Respiratory failure on 8/05

RV study at NCKUH ICU 2017-2018
From symptom onset to ICU admission

Median: **3 days**

(1st & 3rd quartile: 2 & 5 days)

Cia CT. *Sci Rep*. 2021;11(1):20058.

OVID-19 omicron variant
重症病人死亡率

法國 AP-HP ICUs

n = 229

Median age 63 y

Mechanical ventilatoin 41%

ICU mortality

20.0%

成大醫院 2022.04-2023.04

n = 397

Median age 74 y

Mechanical venilation 65%

ICU mortality

19.1%

Vieillard-Baron A. Am *J Respir Crit Care Med*. 2022;206(3):349-363.
Cia CT. Unpublished data.

插管使用侵入式呼吸器 (IMV) 病人
Alpha v.s. Omicron variant in Taiwan

台灣 TSCCC 2021	成大醫院 2022.04-2023.04
Alpha variant	Omicron variant
Mean age 66.8 y	Mean age 72.4 y
In-hospital mortality	In-hospital mortality
36.8%	33.9%

Kao KC. TSCCC study results (unpublished). https://www.youtube.com/watch?v=YACvQb9FQV0
Cia CT. Unpublished data.

Characters of critically ill adults with COVID-19 at NCKUH, n=397

Pneumonia upon ICU admission	225 (56.7%)
Typical COVID-19 pneumonia	91 (22.3%)
Acute decompensated heart failure	122 (30.7%)
Acute coronary syndrome	27 (6.8%)
Acute exacerbation of chronic lung disease	26 (6.6%)
Non-respiratory tract infection	80 (20.2%)

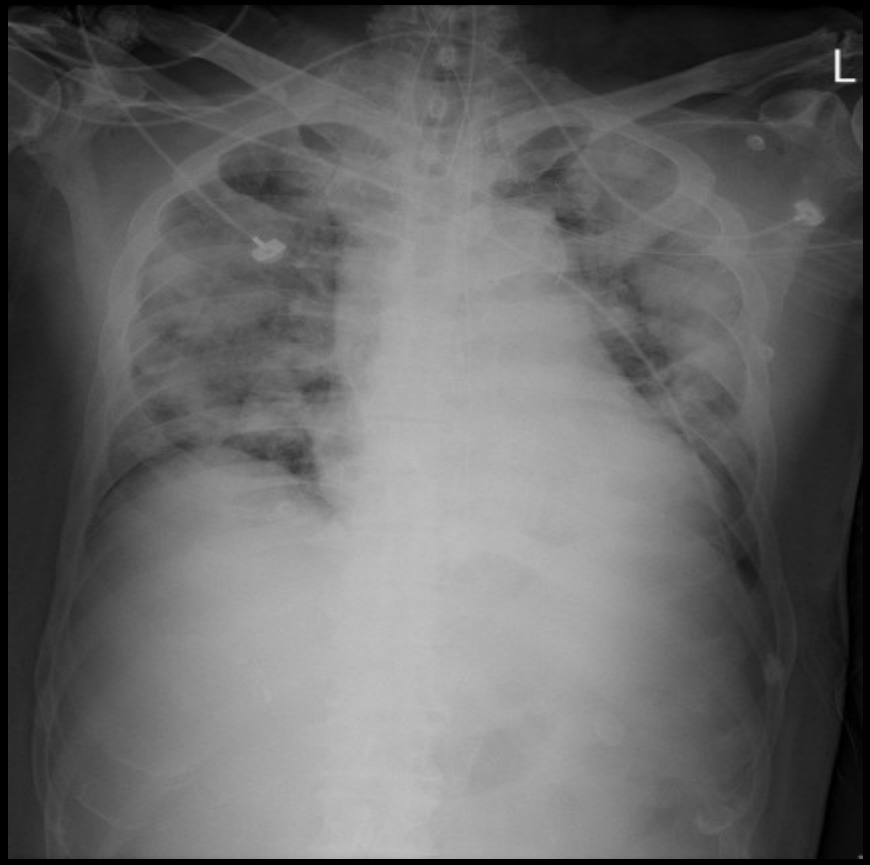
Cia CT. manuscript submitted.

同樣 COVID-19 住進本院 ICU 有沒有打疫苗結果有差距

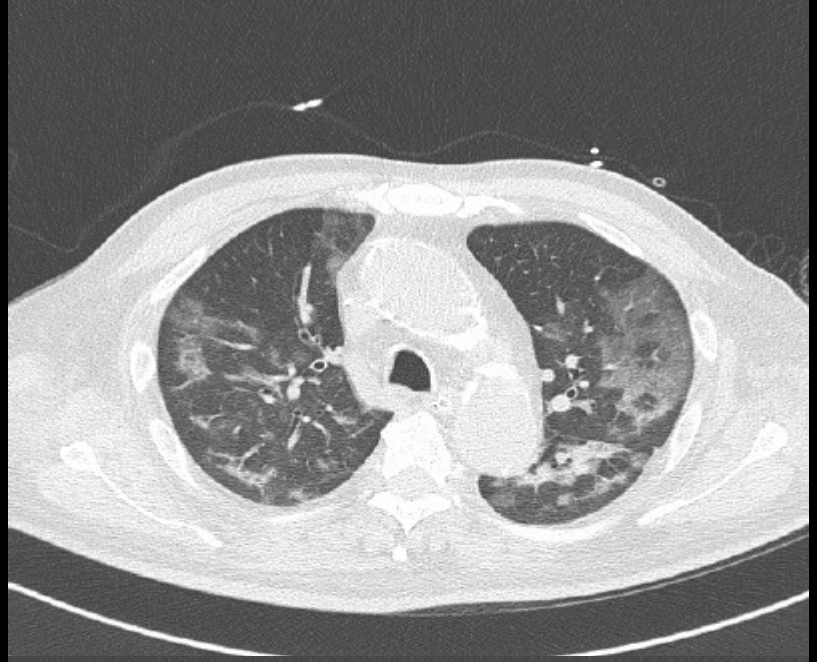
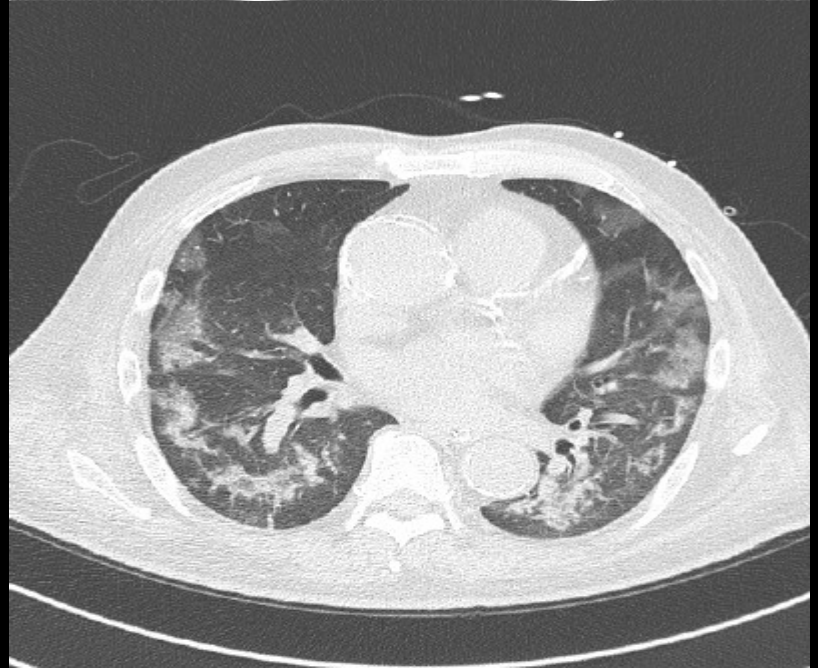
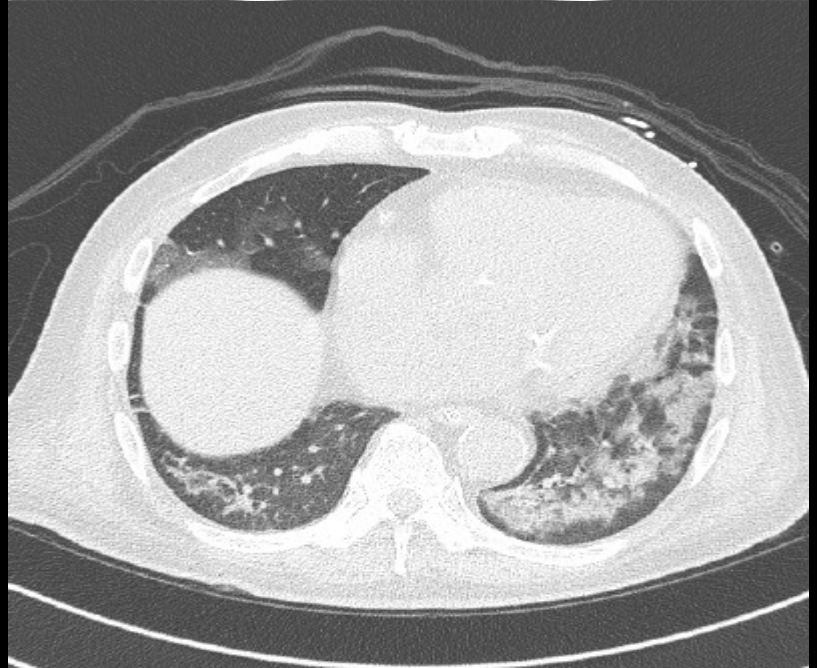
	Vaccine dose ≤ 1 n = 194	Vaccine doses ≥ 2 n = 203	p value
Age	73.7 ± 14.3	70.9 ± 13.7	0.0541
Sex (female)	36.6%	37.4%	0.8624
ICU stay (days)	8 (3.25–19.0)	5 (3–11.5)	0.0029
ICU mortality	22.2%	16.3%	0.1347
Hospital stay (days)	21.5 (12–36)	18 (8–31)	0.0181
In-hospital mortality	34.5%	24.6%	0.0305
Ventilator-free days at 28 days	18.5 (2–28)	24 (7–28)	0.0104

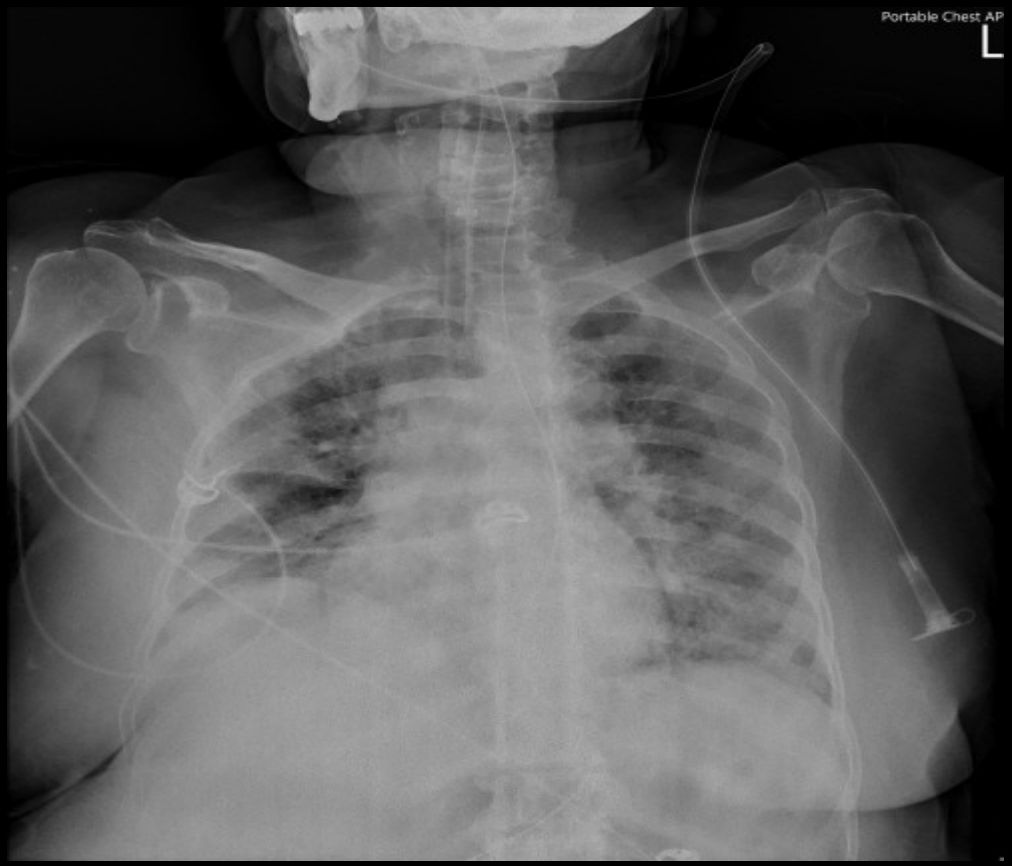
Cia CT. manuscript submitted.

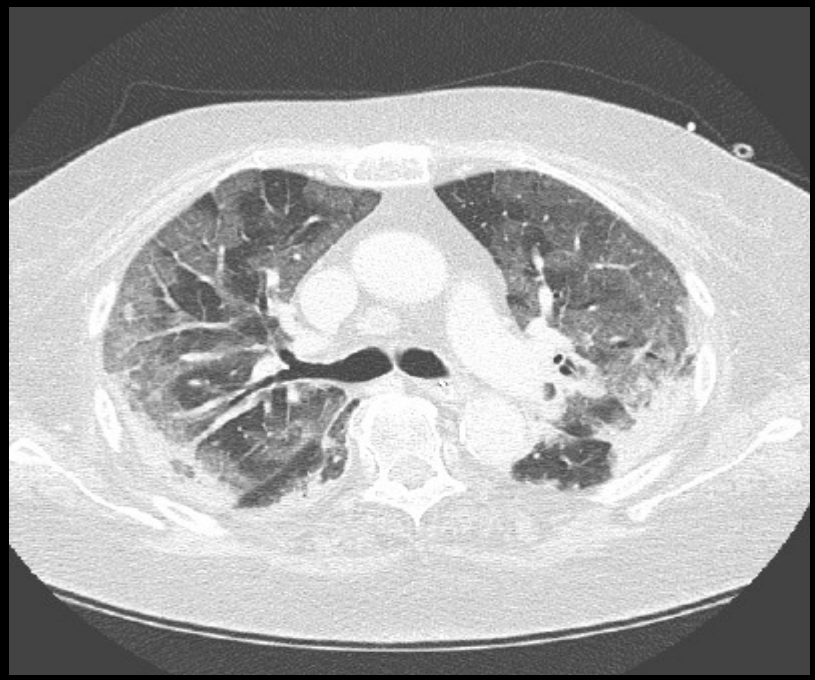
典型的武漢肺炎



69M. ESRD on HD. HTN. DM. Vaccine x0
Chest tightness. Dyspnea. STEMI.
COVID-19 pneumonia.





76F. CKD. HTN. DM. Dyslipidemia. Vaccine x1.
Sore throat initially. Dypsnea & weakness one week later.
Worse respiration for two days.
SARS-Cov-2 Ag-, ETA Ct 27.5

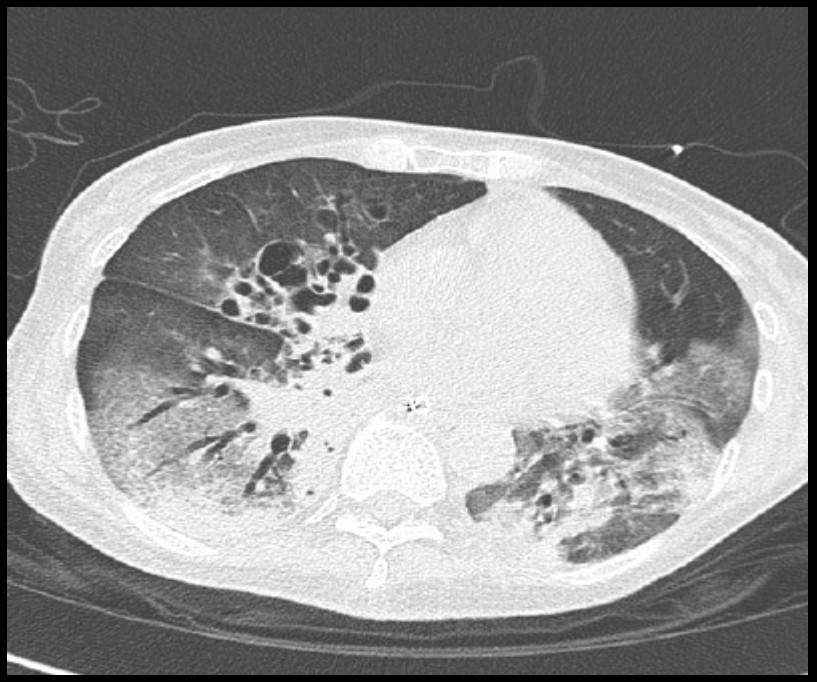
Typical presentation of COVID-19 pneumonia on CXR

- airspace opacities, whether described as consolidation or, less commonly, GGO.
- Distribution: often bilateral, peripheral, and lower zone predominant.
- In contrast to parenchymal abnormalities, pleural effusion is rare (3%).

https://radiopaedia.org/articles/covid-19-4

COVID-19 合併其他肺部感染





60 F. Cervical ca. DM. Depression.
Fever. Dyspnea.
SARS-CoV-2 & *Streptococcus pneumoniae* pneumonia

COVID-19 引起慢性疾病恶化



68 M. CAD. HFrEF. DM. Dyslipidemia. CKD.
Fever and altered mental status.
Acute decompensated heart failure related to COVID-19

COVID-19 重症病人處置

COVID-19 藥物治療
預防重症需在發病後 5 天內給予

- Nirmatrelvir/ritonavir (Paxlovid®)
  - 口服 5 天，藥物交互作用多
- Molnupiravir (Lagevrio®) 沒藥了
  - 口服 5 天，效果差
- Ensitrelvir (Xocova®)
  - 口服 5 天，交互作用比 NMV/r 少，管灌資料稍多
- Remdesivir (Veklury®)
  - 靜脈注射 x3 天
- 單株抗體：沒跟上新變種，沒效了

COVID-19 肺炎住院病人藥物治療

住院不用氧氣	不需要給類固醇或抗病毒藥
使用一般氧氣設備	dexamethasone + remdesivir 5d +/- tocilizumab OR baricitinib
使用 HFNC 或是 NIV	dexamethasone + remdesivir 5d + baricintinib OR tocilizumab
插管 IMV	dexamethasone + baricitinib OR tocilizumab

NIH. COVID-19 Treatment Guidelines. https://www.covid19treatmentguidelines.nih.gov/

請先確定真的是武漢肺炎

- 典型的 COVID-19 pneumonia 發生在開始有症狀之後的第 2 週，所以剛發病沒幾天就來住 ICU 的，不是 COVID-19 pneumonia 。
- COVID-19 pneumonia 專屬的治療 (dexamethasone, tocilizumab, baricitinib) ，都真的是在處理第 2 週以發炎為主的 COVID-19 pneumonia ，還沒發生或根本沒有 COVID-19 pneumonia 就用，只是讓病人增加併發症的風險而沒有好處。

COVID-19 住院病人如不需氧氣 使用類固醇會增加死亡率！

Outcome	No. of Glucocorticoid Patients	No. of Control Patients	Odds Ratio (95% CI)
Mortality	509/3704 (14%)	294/2930 (10%)	1.56 (1.27 – 1.92)
Mechanical ventilation	98/550 (18%)	160/1088 (15%)	1.32 (1.00 – 1.74)

Covello RD. *NEJM Evid*. 2023;2(5):EVIDoa2200283.

病人有 COVID-19 但無肺炎
如因其他因素插管使用呼吸器，不應使用類固醇

COVID-19 重症病人
Bacterial co-infection rate

5.5 – 28%

研究多為 2020-2021, Omicron 未出現

Lansbury L. *J Infect*. 2020;81(2):266-275.
Kreitmann L. *Intensive Care Med*. 2020;46(9):1787-1789.
Contou D. *Ann Intensive Care*. 2020;10(1):119.
Elabbadi A. *Infection*. 2021;49(3):559-562.
Saade A. *Ann Intensive Care*. 2021;11(1):83.
Baskaran V. *J Med Microbiol*. 2021;70(4):001350.
Musuuza JS. *PLoS One*. 2021;16(5):e0251170.
Rouzé A. *Am J Respir Crit Care Med*. 2021;204(5):546-556.
Morris AC. *Crit Care*. 2022;26(1):236.

COVID-19 重症病人要不要用抗生素？個人作法

不用

- 典型 COVID-19 肺炎
  - 發病後 7-14 天呼吸喘
  - 沒有黃痰
  - 影像典型 (週邊 GGO)
- 單純 COVID-19 引起慢性病急性惡化
- Procalcitonin < 0.5 μg/L

用

- 肺炎但不像武漢肺炎
  - 太早 (5 日內) 出現
  - 黃痰
  - 影像不典型
- 休克需使用高劑量生壓劑，須懷疑非呼吸道感染

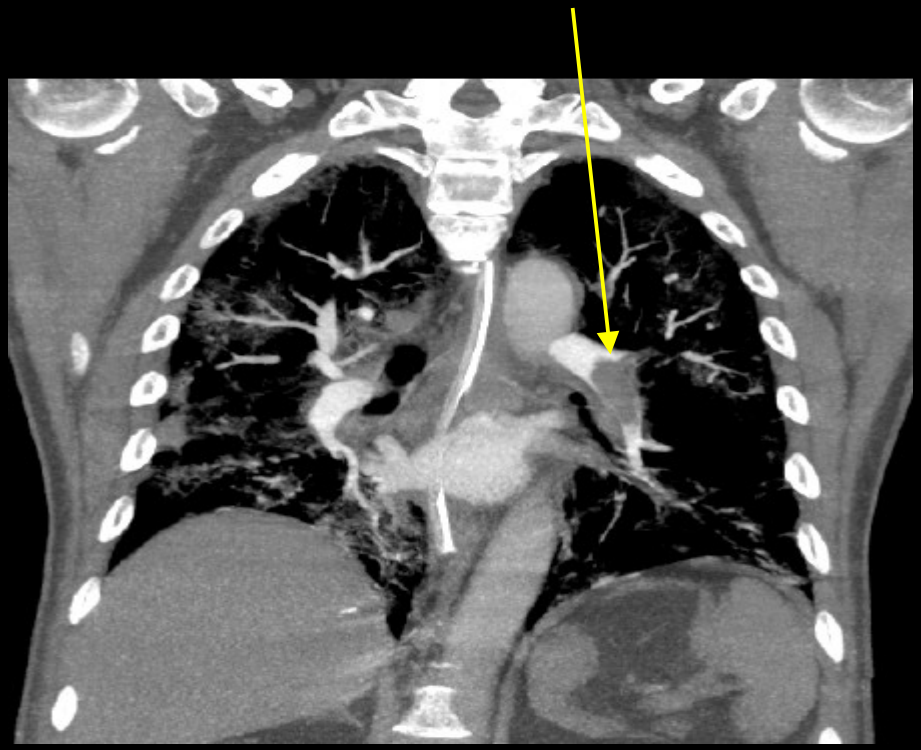
Wei S. *Virol J*. 2023;20(1):92.

COVID-19 重症病人靜脈血栓發生率高
如無出血，建議給抗凝血劑

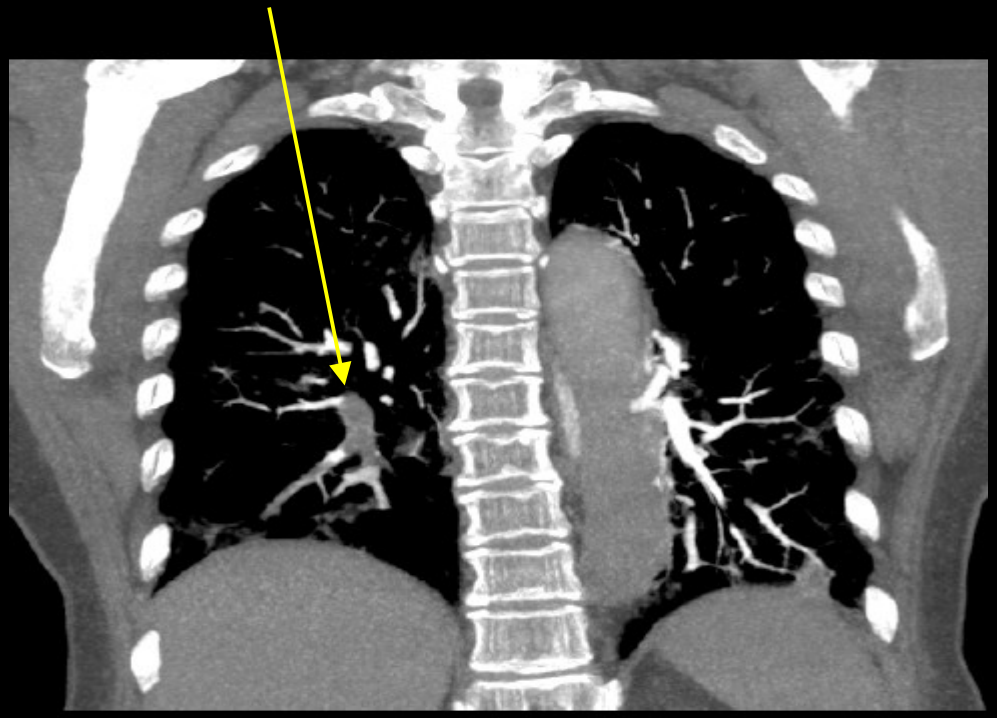
All VTE	Pulmonary embolism
14.3 –27.9%	8.6–24.7%

Suh YJ. *Radiology*. 2021;298(2):E70-E80.
Porfidia A. *Thromb Res*. 2020;196:67-74.
Tan BK. *Thorax*. 2021;76(10):970-979.
Ng JJ. *J Intensive Care*. 2021;9(1):20.
Fujiwara S. *J Infect Chemother*. 2021;27(6):869-875.

COVID-19 with pulmonary embolism



66M. HTN. CAPA+



70F. HTN. CAPA+

如果要做 chest CT ，就直接排 CT angiogram 吧

COVID-19 合併肺麴菌症（CAPA)

- COVID-19 重症病人發生 CAPA 比率 5-28%
- 發生時間比 IAPA 晚一些（ 中位數 6-8 天)
- 風險因子：慢性肝病、血液惡性疾病、COPD 、先前中風、插管、洗腎、 IL-6 阻斷治療、使用類固醇
- 死亡率 ~50%

Feys S. *Lancet Respir Med*. 2024;12(9):728-742.
Bay P. *Ann Intensive Care*. 2024;14(1):65.
Gioia F. *Lancet Respir Med*. 2024;12(3):207-216.

COVID-19 重症病人院內感染機會大
住院過程需小心處理

呼吸器相關肺炎　　血流感染

26 – 50%　15 – 26%

Rouzé A. *Intensive Care Med*. 2021;47(2):188-198.
Ferreira FC. *Ann Intensive Care*. 2021;11(1):92.
Giacobbe DR. *J Clin Med*. 2021;10(4):555.
Ferrando C. *Rev Esp Anestesiol Reanim (Engl Ed)*. 2020;67(8):425-437.
Buetti N. *Intensive Care Med*. 2021;47(2):180-187.
Grasselli G. *Chest*. 2021;160(2):454-465.

本院加護病房資料 2022.04-2023.04

- 合併其他肺部感染病原 26.4%
- 肺栓塞 2.5%
- CAPA 5.5%
- 後續肺炎 (VAP/HAP) 25.4%

CT Cia. manuscript submitted

其他呼吸道病毒重症

其他呼吸道病毒

- Respiratory syncitial virus (RSV)
  - A & B
- Human metapneumovirus
  - A & B
- Enterovirus
- Rhinovirus
- Adenovirus
- Parainfluenza virus
  - 1-4
- Coronavirus
  - SARS, MERS
  - NL63, OC43, HKU1, 229E
- Bocavirus

在國外的 ICU 比 influenza 多

Clin Infect Dis. 2014;59:62-70.



rhinovirus

adenovirus

coronavirus

Critical Care. 2016;20:375



influenza virus

rhinovirus

coronavirus

Chest. 2018;154:84-90.



rhinovirus

influenza A

RSV

Crit Care Med 2018;46:29–36

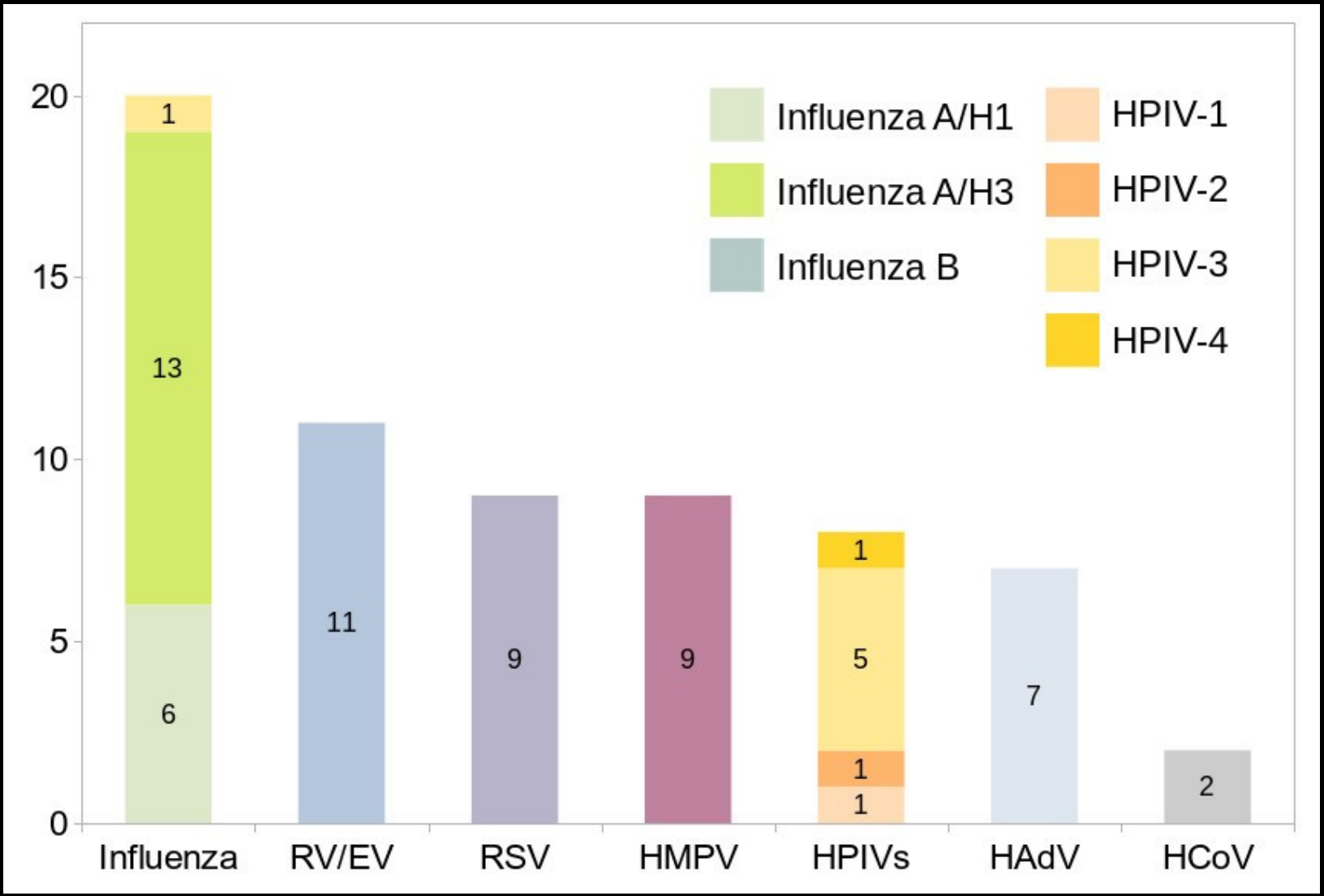


parainfluenza virus 3

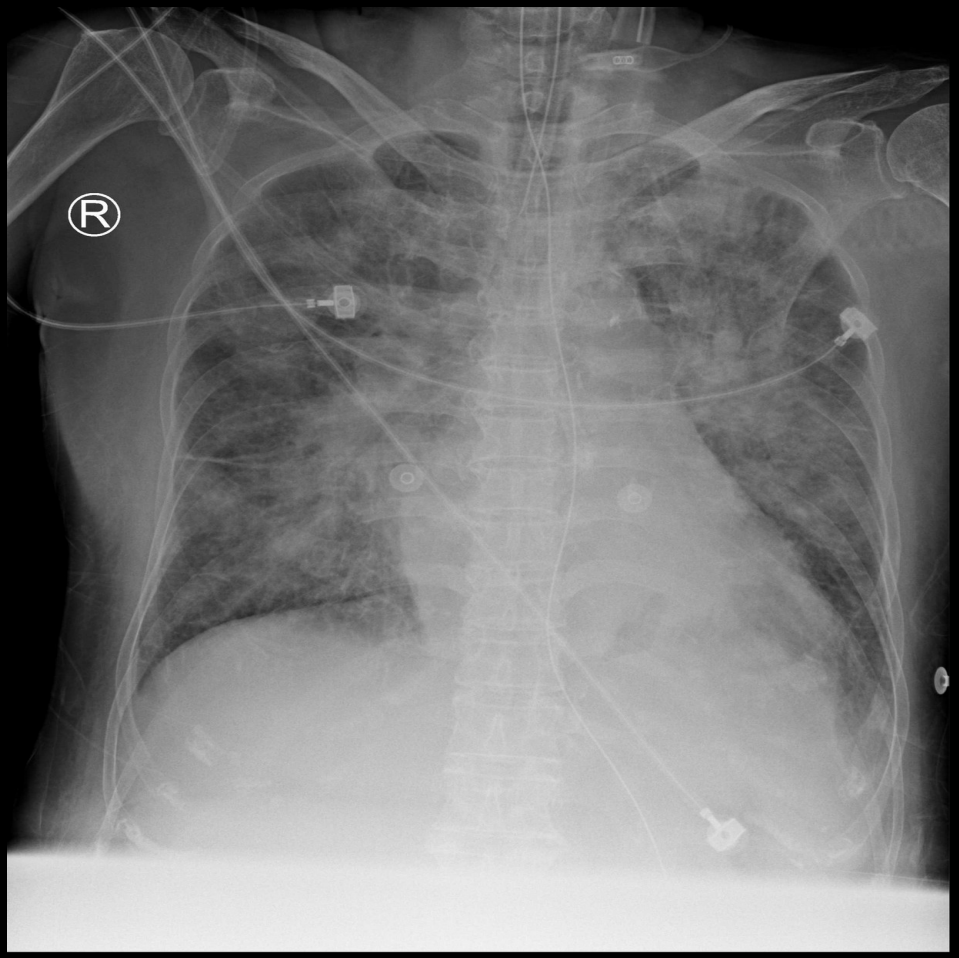
rhinovirus

coronavirus

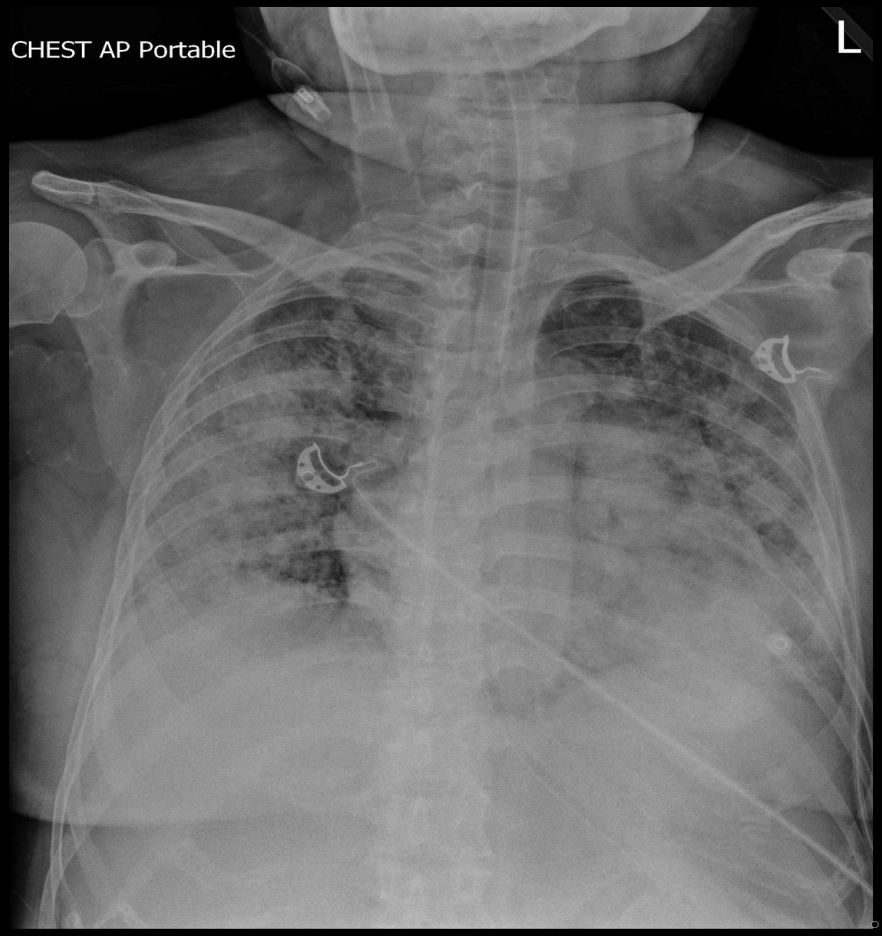
在台灣 ICU 也不少見



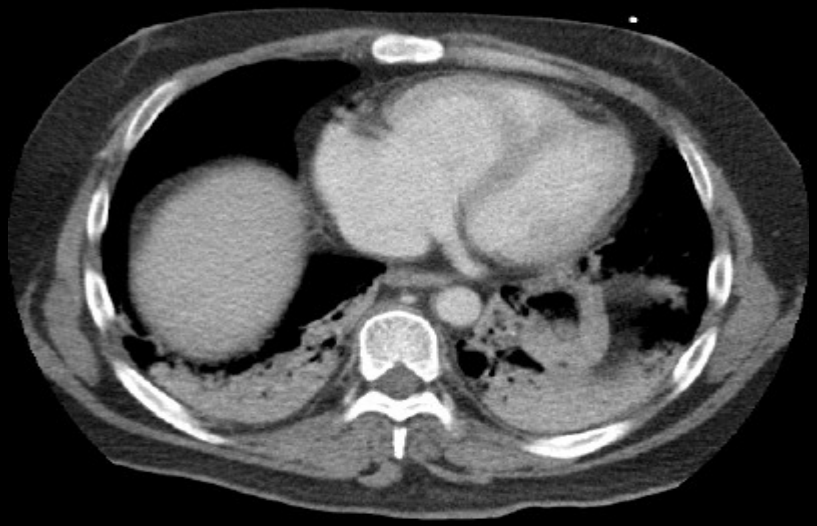
Cia CT. *Sci Rep*. 2021;11(1):20058.



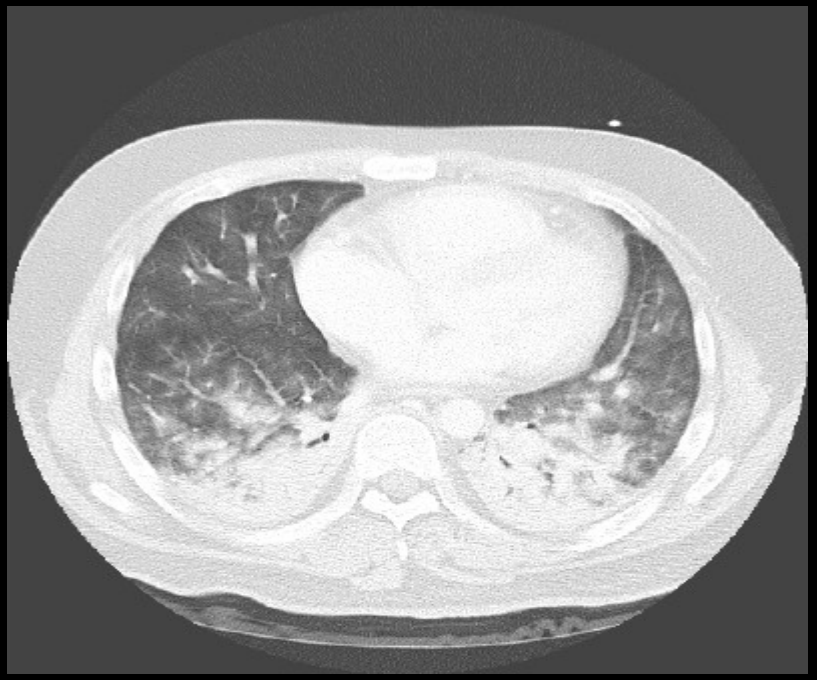
63 F. HTN. HFpEF. Dyslipidemia
Upper airway symptom for 3 days. Dyspnea.
Parainfluenza virus 3 pneumonia



55 F. DM. IDA. Dyslipidemia.
Fever and URI symptom for 5 days. Dyspnea.
Human metapneumovirus pneumonia



Dilated RA, RV



Bilateral GGOs
BLL consolidatoin

30 M. No chronic disease.
URI symptom for 4 days. Dyspnea.
IHCA at ED. Withdrawal of ECMO on D9.
RSV pneumonia

其他呼吸道病毒感染也可以很嚴重
Human metapneumovirus

- Shock 60.7%, IMV 50% MV, ICU mortality 14.3%



Vidaur L. *Ann Intensive Care*. 2019;9(1):86.

- Pressor use 23%, IMV 55%, mortaility 18%



Hasvold J. *J Crit Care*. 2016;31(1):233-7.

- 402 patients, 26 admitted to ICU

  in-hospital mortality 30.8%



Kapandji N. *Ann Intensive Care*. 2023;13(1):21.

其他呼吸道病毒感染也可以很嚴重

RSV

- IMV 36.6%, In-hospital mortality 23.9%
- No difference from severe influenza in ICUs




Coussement J. *Chest*. 2022;161(6):1475-1484.

- Septic shock 51%, IMV 89%, bacterial co-infeciton 28.3%, in-hospital mortality 45.5%
- 30d mortality 26.1%, in-hospital mortality 43.5%
- comparable to influenza-associated pneumonia.



Kim T. *Open Forum Infect Dis*. 2023;10(4):ofad131.

- IMV / death > vaccinated COVID-19 / influenza



Surie D. *JAMA Netw Open*. 2024;7(4):e244954.

其他呼吸道病毒感染
抗病毒藥物有限，資料也少

RSV

ribavirin

adenovirus

cidofovir

RNA viruses

favipiravir

Arabi YM. *Intensive Care Med*. 2020;46(2):315-328.

呼吸道病毒感染重症病人
呼吸通氣處置

HFNC 及 NIV

- 一般氧氣設備使用效果不佳，可使用 HFNC oxygen 。如果反應不好，改用 NIV 或插管使用侵襲性機械通氣。 (BIIa).
- 如果呼吸衰竭病人還沒到要插管，又沒有 HFNC 可用，可使用 NIV 並密切監測 (BIIa).

NIH. COVID-19 Treatment Guidelines. https://www.covid19treatmentguidelines.nih.gov/

COVID-19 出現前的研究

- HFNC 可減少插管
  - OR 0.62 (compared to conventional O2 therapy)
  - OR 0.48 (compared to NIV)
- HFNC 可減少加護病房死亡率
  - OR 0.47 (compared to conventional O2 therapy)
  - OR 0.36 (compared to NIV)
- HFNC 不影響加護病房住院天數

Ni YN. *Am J Emerg Med*. 2018;36(2):226-233.

HFNC & NIV (COVID-19)

- 氧氣較差的病人 (P/F < 200) ，使用 HFNC 比一般氧氣設備，插管率較低，恢復較快。

  Ospina-Tascón GA. *JAMA*. 2021;326(21):2161-2171.

- 看到 SpO2 ≤ 92% 就用上 HFNC ，沒有比一般氧氣設備好

  Crimi C. *Thorax*. 2023;78(4):354-361.

- 在氧氣不好的病人 (FiO2 0.4, SpO2 < 94%) 的病人， NIV 和 HFNC 都比一般氧氣設備好。

  Perkins GD. JAMA. 2022;327(6):546-558.

清醒俯臥 (awake self proning)

2020 年起 COVID-19 疫情時開始流行

血氧會上升

可以減少一點插管（↓6%)

死亡率沒差

NIH 建議：還沒面臨插管的病人可嘗試

Ehrmann S. *Lancet Respir Med*. 2021;9(12):1387-1395.
Alhazzani W. *JAMA*. 2022;327(21):2104-2113.
NIH. COVID-19 Treatment Guidelines. https://www.covid19treatmentguidelines.nih.gov/

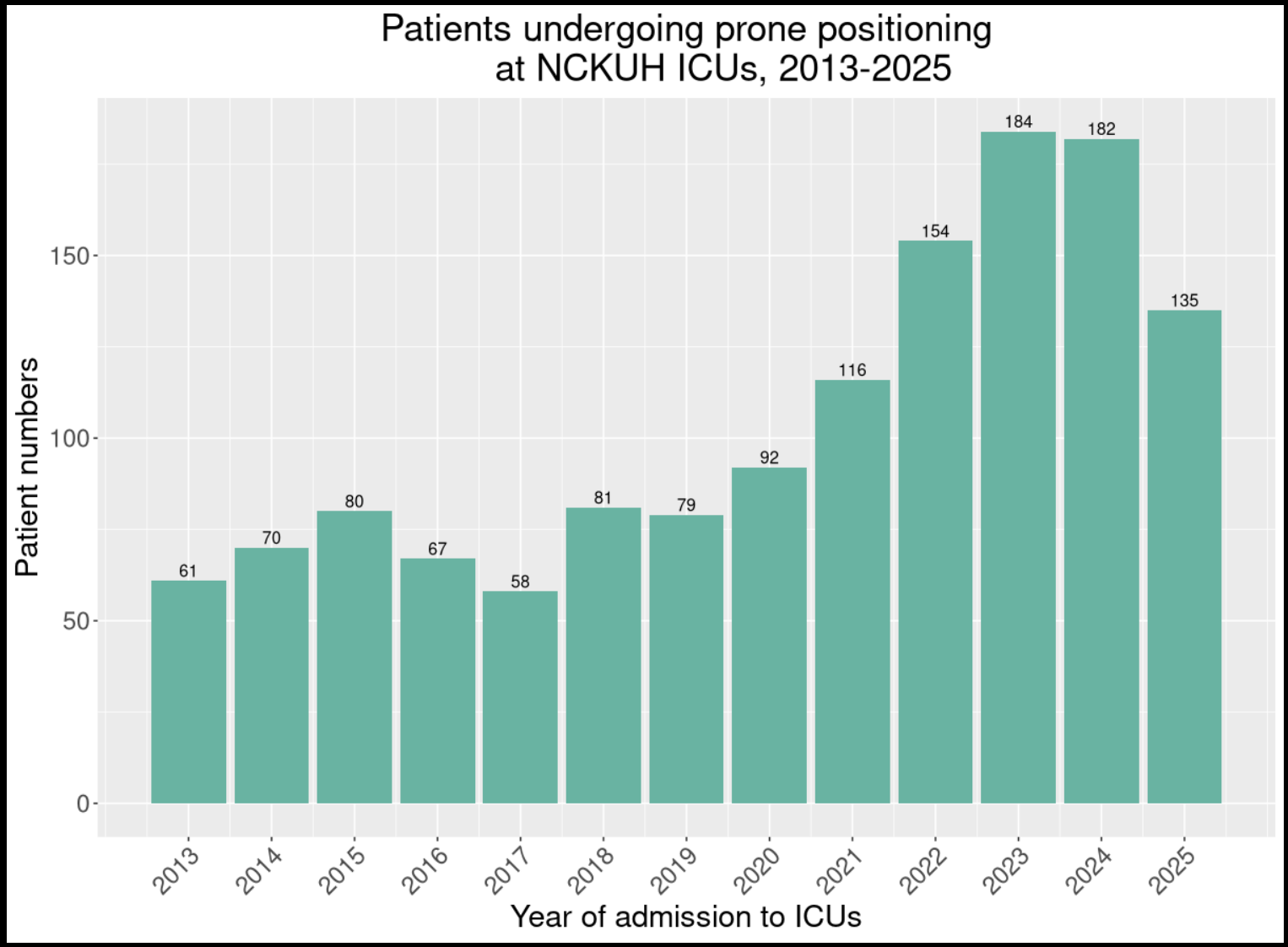
A patient on HFNC, awake prone positioning, up to 13.5 hr/d



呼吸道病毒病人通氣策略和一般重症病人相同

- 使用較低的潮氣量 (4–8 ml / kg PBW) 和較低的吸氣高原壓力 (plateau pressure < 30 cmH2O)
- 對於重度 ARDS 的成人患者，建議每天應進行至少 12-16 小時俯臥式通氣 (prone ventilation)
- 對沒有組織灌注不足的 ARDS 患者使用保守性的液體管理策略。
- 中度或重度 ARDS 患者，建議使用較高的 PEEP ，不建議常規使用 NMBA 持續輸注。
- 肺部保護性通氣後仍有低血氧症的患者，是否需使用 ECMO ，應由具有相關醫療專業的團隊評估。

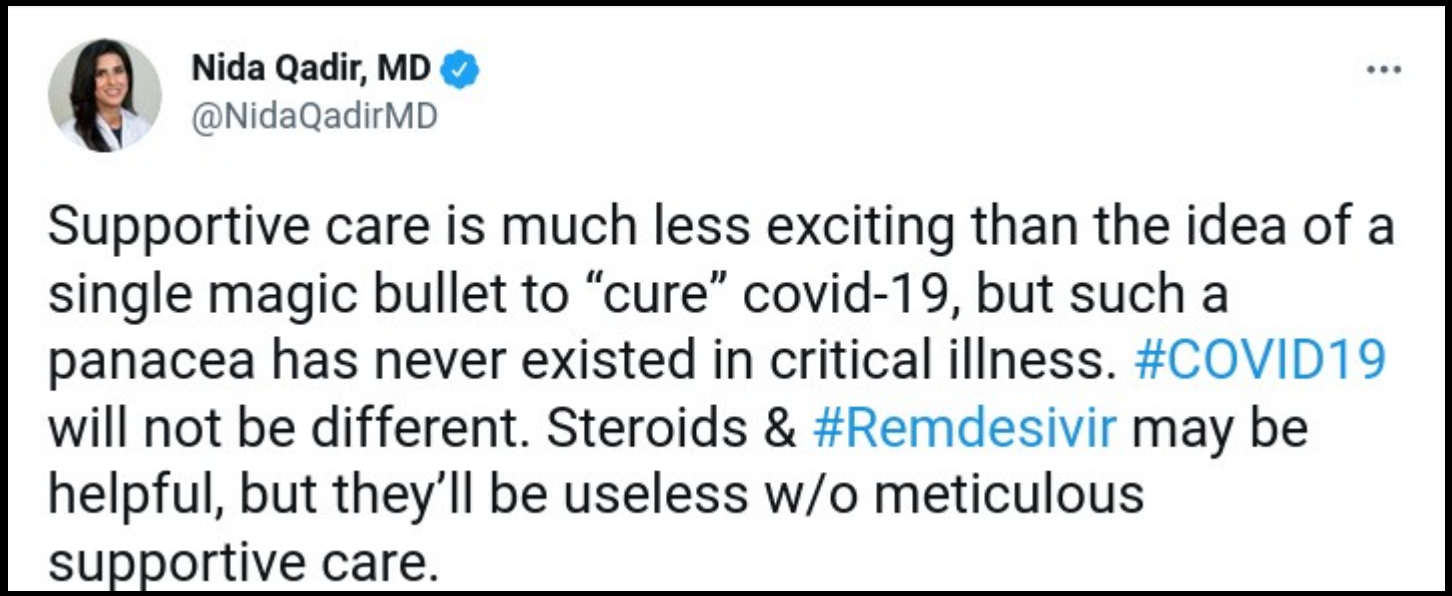
俯臥通氣 2013-2025, NCKUH



包含 ECMO 病人也可以俯臥



重症照護 = 嚴謹的支持性治療



https://twitter.com/NidaQadirMD/status/1287443875167051776

- 密切監測
  - 心律 / 血壓 / 血氧
  - 動脈導管 / 心輸出
  - 隨時有人看
- 器官支持
  - 氧氣 / 呼吸器 / 俯臥
  - 升壓劑 / 強心劑
  - IABP / ECMO
  - 腎臟替代療法

Take Home Messages

- 呼吸道病毒感染重症照護，最重要的是嚴謹的支持性療法，包含呼吸器、俯臥通氣等等。
- 流行季、接觸史、上呼吸道症狀是重要線索，無明顯原因的呼吸道重症也該檢驗呼吸道病毒
- 流感重症肺炎目前建議使用抗病毒藥物，不建議常規使用類固醇
- 典型 COVID-19 肺炎是在發病後第二週出現，發炎成份明顯，除了抗病毒藥之外也需使用類固醇 /tocilizumab / bacricinitib 等免疫抑制劑
- 要小心 co-infection ，也不要因此濫用抗生素