

Ventilator use during COVID-19 pandemic

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COVID-19: Epidemiology

- Taiwan

- Confirmed cases: 429
- Intubation rate: 5.5% (24)

- Italy:

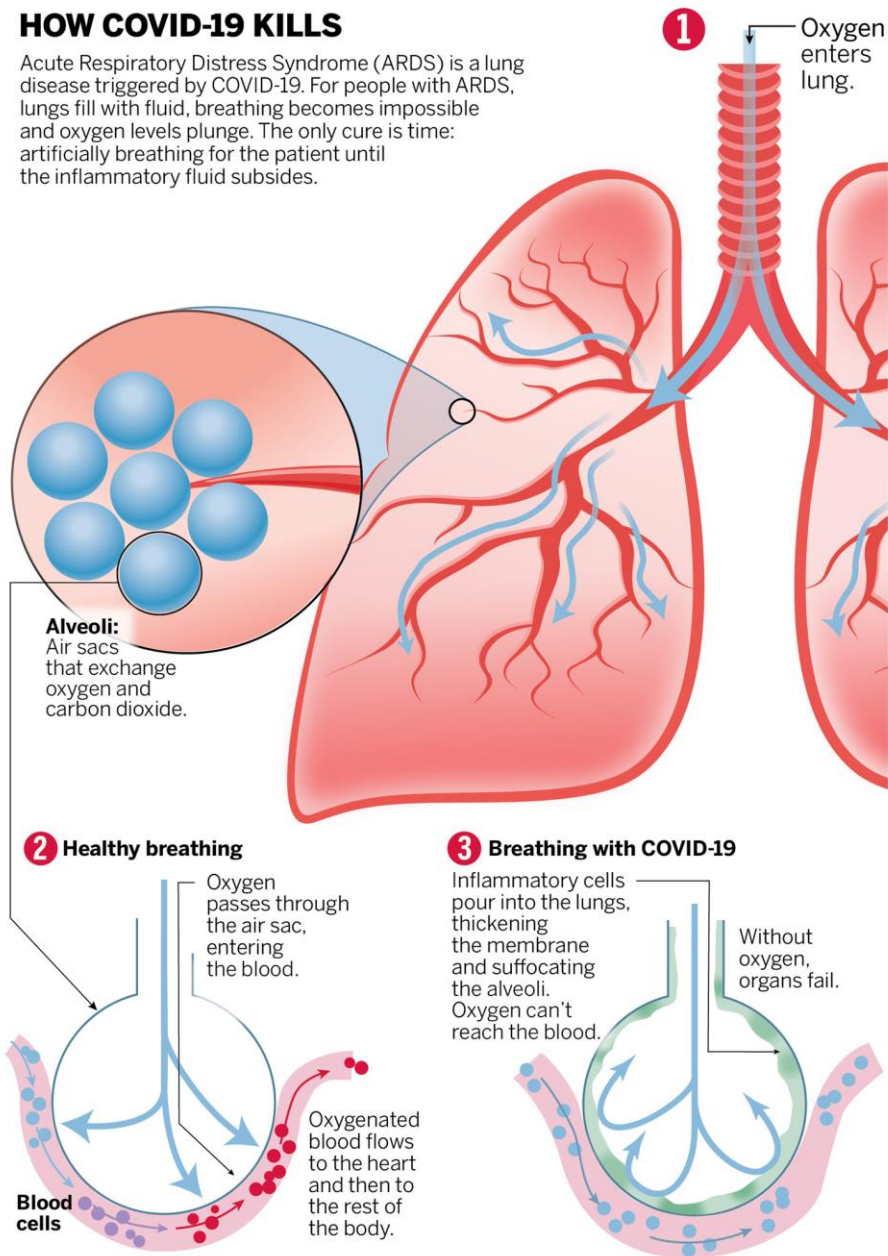
- Confirmed cases: 220,000
- Intubation rate: 5-12 %

- WHO

- Confirmed cases: 4 millions
- Intubation rate: 12%

HOW COVID-19 KILLS

Acute Respiratory Distress Syndrome (ARDS) is a lung disease triggered by COVID-19. For people with ARDS, lungs fill with fluid, breathing becomes impossible and oxygen levels plunge. The only cure is time: artificially breathing for the patient until the inflammatory fluid subsides.



Lungs with the COVID-19

- Inflammation responses
 - Water leakage
 - Lung collapse
- Filled with thick mucus
 - reduced volume
 - slowed diffusion

→ 呼吸衰竭

→ PO_2 decreases, PCO_2 ↑ increases

→ Work of breathing increase

Management of COVID

- 20 % infected patients developed into hypothermia, and 10% of patient require intubation and mechanical ventilation support.

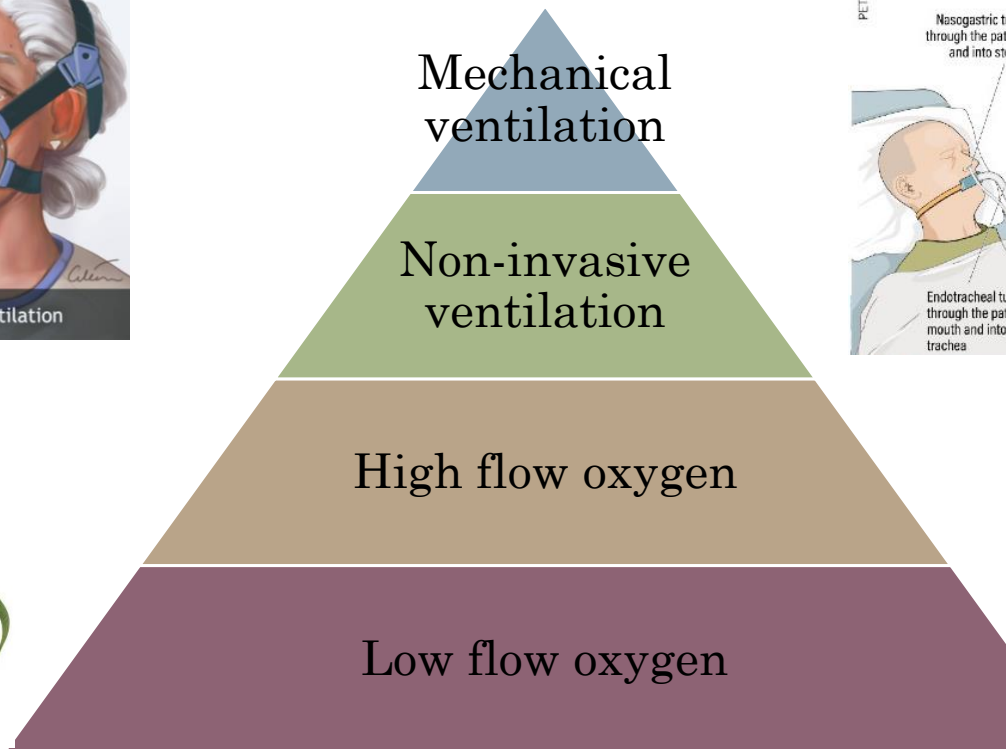
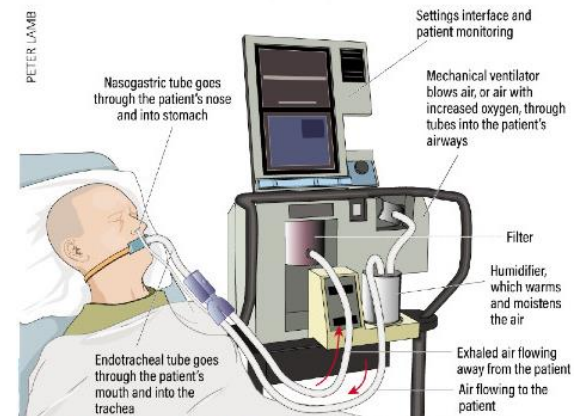
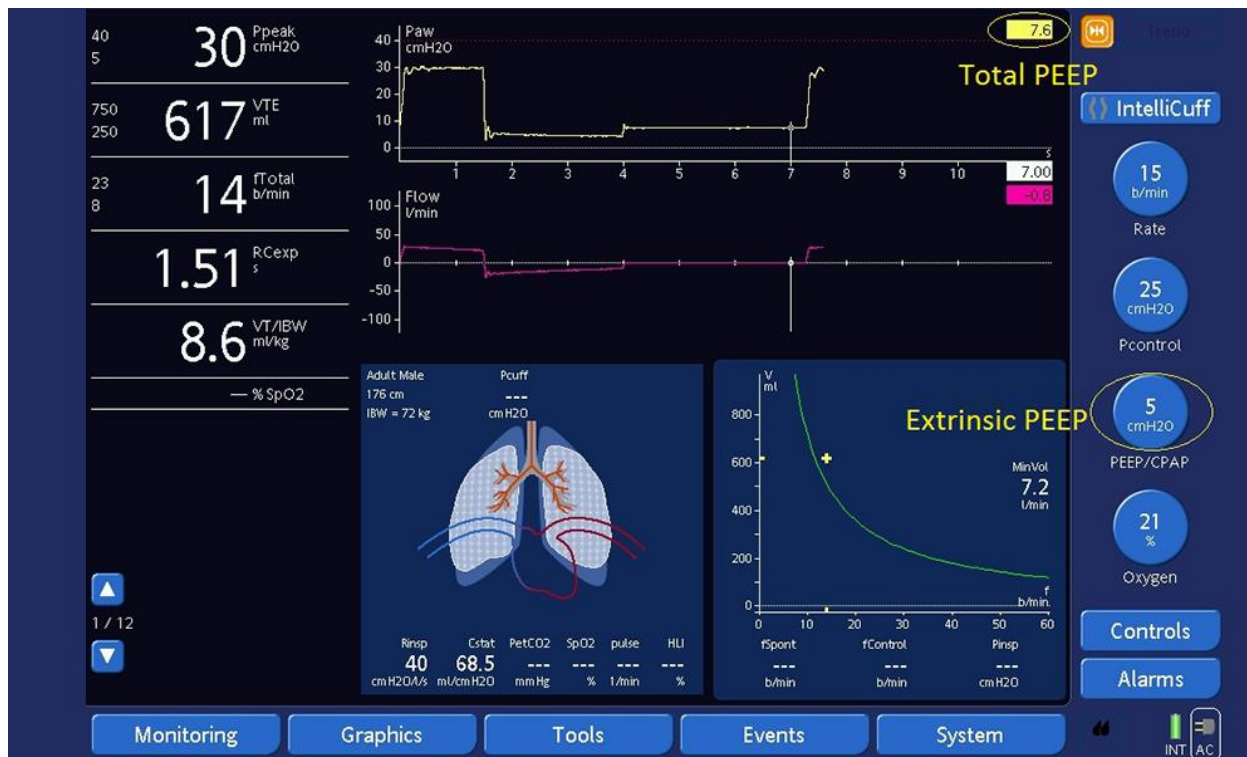


Figure 1. Mechanical ventilator for positive pressure ventilation



呼吸器: 向天搶一口氣

- Ventilation with sufficient volume
- Sustain alveoli open
- **Goals:** improves oxygenation & CO₂ elimination



When to intubate?

- Critical Care Society
 - In adults with COVID-19 receiving HFNC or NIPPV, we recommend close monitoring for worsening of respiratory status, and early intubation in a controlled setting if worsening occurs
- Worsening outcome of early intubation?
 - Italy: endotracheal intubation in 88% and noninvasive ventilation in 11%; ICU mortality was 26%
 - ? Who are in charge to manage ventilators
 - ? Neuromuscular relaxant use
 - ? Other complications

呼吸器國家隊

- 4/7會議: 重症醫師、呼吸治療師、呼吸器進口商
- 衛服部每天統計呼吸器數量，共有1萬台、每天可調度呼吸器約1300台(可供15,000-20,000病人)
 - 約500台備用(較少使用的)呼吸器
 - 備用呼吸器由呼吸治療全聯會協助分類，各縣市均有呼吸治療師自願正在協助檢視呼吸器可用狀態

Thank you

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