COVID Considerations:
Immediate isolation is needed, review institutional protocols. In the ICU:
1) Can you skip the chest radiograph (CXR) and make a diagnosis (dx) with the physical exam (↓ risk of contaminated equipment)?
2) Minimize bronchoscopy (aerosolization risk) and use only if absolutely needed (lung volume loss, not just secretions)
3) Noninvasive
4) Some unconfirmed reports of COVID-19 patients requiring substantial sedation when intubated (↑ air hunger), but minimize use if possible

Hypoxia:
● Consider dx of COVID-19 in all patients who present with hypoxia without other apparent cause during peak periods of disease activity.
  ○ Very low O₂ saturation (SaO₂) seen in COVID-19 cases
  ○ Consider using clinical condition in lieu of SaO₂ to guide decision for intubation
● Management of hypoxia in the ICU setting mirrors that in operating room (OR) algorithms, with a few additional items including checking arterial blood gases (ABG) and CXR
  ddx→ ↓FiO₂, hypoventilation, V/Q mismatch, shunt, ↓ diffusion
  ○ ↑ Vol (crackles, neck veins) → CHF or iatrogenic vol overload → IV furosemide, trial NIPPV (caution in COVID-19 due to risk of aerosolization), fix rhythm, fix HTN if concurrent; consider cardiac ischemia w/u
  ○ Wheezes → Anaphylaxis as you would in the OR; also, COPD/asthma
    ■ COPD: nebs (albuterol prn, ipratropium q4-6h), prednisone 40 mg qd x5d, d/w ICU antibiotics; Asthma: continuous albuterol neb, heliox
  ○ Tachycardia → consider PE, revised Geneva score, CTA (IV contrast), LE doppler to r/o DVT if CT not available, start heparin gtt per protocol, RV support
    ■ Tachycardia + Hypotension → r/o tamponade
  ○ ↓ BS → PTX, effusion, atelectasis, PNA → u/s or CXR can r/o PTX, effusion
    ■ Lobar atelectasis → Mucus plug → bronch (avoid in COVID-19 cases)
    ■ Fever, ↑ WBC, infiltrate → PNA also r/o respiratory viruses, including influenza, SARS-CoV-2 cultures before abx! Consider if patient needs isolation and staff need PPE, keep low threshold of suspicion.
  ● VAP (ventilator-associated PNA) → BCx x2, tracheal aspirate/BAL, empiric abx vancomycin (cover MRSA), cefepime or piperacillin/tazobactam (cover gram-negative including PsA)
• Rates of bacterial co-infection low in COVID-19 (8.1% of critically ill patients)\(^1\)
  - ↓ breathing → r/o opioid o/d → naloxone 0.04-0.4 mg titrated to effect

• Hypercarbia: see opioid o/d, PE, COPD/asthma (above)
  - ddx→ ↑ dead space, V/Q mismatch, ↑ CO\(_2\) production (fever, MH)
  - Other emboli: air, fat, AFE → support RV→ dobutamine or epi if hypotension

• Primer: injured lungs and ARDS
  - Lung Injury → ↓ Compliance → ↓ TV for same pressure or ↑ pressure for same TV
    - Lung protection: 1) prevent overstretching stiff lungs (↓ TV); 2) prevent pressure injury to lung (↓ P\(_{\text{plateau}}\), ↓ driving pressure); 3) prevent opening/closing of alveoli (↑ PEEP, recruitment); 4) treat other injuries
  - Lung protective ventilation → see Ventilation section

• Lung rescue strategies
  - Prone positioning may improve outcomes\(^2\) and has been increasingly described in COVID-19\(^3,4\); must involve entire/ dedicated team and proper PPE
  - Early paralysis with NMBD for 48 h may be indicated\(^5,6\)
    - Sedation: see Neuro section, consider short-acting drugs and avoid benzodiazepines
  - Conservative fluid tx / early diuretics
  - Trial of inhaled pulmonary vasodilator (epoprostenol / iNO) to ↓ shunt → stop if no improvement or worsening (does not change mortality)
  - Consider short course of dexamethasone 10 mg IV daily with onset of ARDS\(^7\)
  - Refractory hypoxemia/hypercarbia: see ECMO section

• PPx
  - VAP PPx: HOB >30, sedation interruption/SBT ≥ qd (d/w ICU consult)
    - Stress ulcer PPx, DVT PPx: see Best Practices section

• Team Approach
  - Nurses, Respiratory Therapists, Pharmacists, Nutritionists, Palliative Care Consultants will all assist with management and should be involved in decisions

• Goals of Care: address early and often, particularly when considering intubation in patients with ↑ age / ↑ comorbidities

References


