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Health care worker isolation and management summary for COVID-19 - A rapid review of the evidence

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COVID19 CHS – Health care worker isolation and management summary from pre-existing guidelines

6/4/20, L KIRK

Acronyms:

- WHO: World Health Organization, CDNA: Communicable Diseases Network Australia, PPE: Personal protective equipment, HCW: Healthcare worker, NPIR: Negative pressure isolation room, AGP: Aerosol-generating procedure (including CPR, manual ventilation, intubation, bronchoscopy, suctioning)

Summary:

- **HCWs should be isolated and tested for COVID19 if:**
 - o **(Fever $\geq 38^{\circ}\text{C}$ or Hx of fever (night sweats, chills)) **OR** acute respiratory infection (cough, SOB, sore throat)** (CDNA SoNG 26/03/20)
 - o HCWs will be considered “close contacts” of a case if they:
 - **Have direct contact w/ body fluids or lab specimens of a confirmed case w/o recommended PPE, or failure of PPE**
 - **Are in the same hospital room when an AGP is undertaken on a case w/o recommended PPE**
 - o **Close contacts must complete 14 days isolation**
 - **Even if a close contact develops symptoms, is tested, and is “negative”, they must complete the 14 days isolation**
- Temperature and Sx monitoring of all staff and often visitors and all patients, is common → either at home, or on arrival to work → app or webform
 - o If screened positive for fever or Sx, referred to either fever clinic or staff clinic
 - o Must remember may not always be effective due to a proportion of asymptomatic cases (~15-25%)
- Main contributing factors to HCW infections:
 - o 1. **Lack of understanding** of pathogen and lack of awareness of importance of PPE, lack of PPE, poor set-up of wards and equipment
 - o 2. Exposure to **large numbers of infected patients** and high risk procedures such as using nebulised medications and intubation
 - o 3. **Pressure** of treatment, work intensity and high nursing requirement, **lack of rest**
 - o 4. **Shortage** of PPE, and changes in PPE due to variable supply chain
 - o 5. Lack of adequate training – **difficult to provide systematic training and practice due to emergency response**
- Other recommendations:
 - o Do not allow staff to work in multiple facilities
 - o Dedicated teams to COVID19 working in 4hr blocks (small teams, no unnecessary people), maintain logs of staff entering zones or rooms
 - o Restricted access to whole hospital for visitors and non-essential personnel (including medical students in countries like Singapore)
 - o Screening of HCWs via body temp and symptoms
 - o Infection prevention training and PPE use, contingency plans for acquiring PPE
 - o Dedicated ambulances – can be used to transfer between facilities, and pick up those in quarantine who become Sx
 - o Ensure clear and timely communication to staff, ensure collaborative team spirit
 - o Patients with fever of unknown aetiology or acute respiratory Sx should be evaluated prior to ED entry, and the zoned according to risk
- Limited information and evidence for isolation of staff, however, does not seem uncommon in countries like China and Singapore
 - o Includes monitoring of temperature, symptoms and psychological stress

- They also recommended on finishing working with COVID19 patients – isolate for 14 days + neg PCR
- Three aims:
 - Stop staff nosocomial infections
 - Stop patient nosocomial infections
 - Stop staff-family/community transmission
- Three checkpoints/transition zones:
 - Before coming to work/shift
 - At work
 - Leaving work/after work
- Three questions:
 - Do we need to screen staff? Temp +/- symptoms? What do we do if it is positive?
 - What happens if staff have contact with a case?
 - What happens when staff go home?

EVIDENCE BASE AND SOURCE

Guideline: **COVID-19 CDNA National Guidelines for Public Health Units¹**

Version 2.4

Updated regularly:

<https://www1.health.gov.au/internet/main/publishing.nsf/Content/cdna-song-novel-coronavirus.htm>

Guideline: **Handbook of COVID-19 Prevention and Treatment²**

(This is the “big” handbook produced by The First Affiliated Hospital, Zhejiang University School of Medicine)

SUMMARY – RELATING TO HCW MANAGEMENT

- Primarily for contact tracing and out-of-hospital management of individuals in isolation and details on PPE
- Helpful in regard to clarifying **case definitions** – based on tests, clinical and epi criteria (see latest version of CDNA SoNG)
 - o **Confirmed:** tests positive for SARS-CoV-2 using a validated test
 - o **Probable:** (Fever ($\geq 38^{\circ}\text{C}$), or history of fever OR acute respiratory infection) AND **household** contact of confirmed OR PROBABLE case
 - o **Suspect case:** split into risk category based on clinical and epi features
- **HCWs fall into “moderate risk” category – should be isolated and tested if presenting with:**
 - o **Fever $\geq 38^{\circ}\text{C}$ or Hx of fever (eg. Night sweats, chills)**
 - **OR**
 - o **Acute respiratory infection** – cough, SOB, sore throat
- **If resources become scarce, testing household contacts of confirmed or probable cases may not be indicated**
 - o These would then become “probable” cases
- For suspected cases who initially test negative for SARS-CoV-2, a risk assessment should be undertaken.
 - o **If high index of suspicion and no alternative diagnosis, consider continued isolation, use of PPE, further testing, and re-assessment** (see CDNA).
- See most up to date CDNA SoNG regarding management of, and release of confirmed or probable cases from isolation.
 - o **Release of HCWs from isolation is different from that of the general population** (pg 10, v2.4)
- **Definition of “close contact”** regarding HCWs (not including home exposure, travel, ect.):
 - o **Direct contact w/ body fluids or lab specimens of a confirmed case w/o recommended PPE, or failure of PPE**
 - o **A person in the same hospital room when an AGP is undertaken on a case w/o recommended PPE**
- **Even if a close contact develops symptoms, is tested, and is “negative”, they must complete the 14 days isolation**
- **TEAMS:** Staff divided into different teams – team max. 4hrs in an isolation ward.
 - o Teams should enter, and exit as a group to reduce frequency of staff movement in and out of isolation wards
 - o Staff must wash themselves before going off duty
- **HEALTH MONITORING:**
 - o Front line staff in isolation areas, including health personnel, medical technicians, property and logistics personnel shall live in isolation accommodation and shall not go out without permission
 - o A “nutritious diet” shall be provided
 - o The temperature and symptoms of staff should be monitored and recorded each day
 - o Address psychological problems of staff with experts as they arise
 - o When front-line staff, including healthcare staff, technicians, property and logistics personnel finish work in isolation and return to normal life → test using PCR → if negative, isolate collectively for 14 days → discharge

Article: SARS in Taiwan: an overview and lessons learned³

[https://www.ijidonline.com/article/S1201-9712\(04\)00176-6/fulltext](https://www.ijidonline.com/article/S1201-9712(04)00176-6/fulltext)

- Hospital staff and patients with exposure to SARS patients were quarantined in a healthcare facility for 14 days (later changed to 10 days)
 - o All others were quarantined at home
 - o Those in quarantine had food delivered three times a day by public health nurses
 - o Body temperature and symptoms were self-monitored three times a day, and then reported by phone to the nurse
- SARS containment teams were set up by CDC and teaching hospitals
 - o They would observe and demonstrate the recommended SARS infection control practices and provide PPE

Article: Risk factors for SARS infection among hospital healthcare workers in Beijing: a case control study⁴

<https://doi.org/10.1111/j.1365-3156.2009.02255.x>

- HCWs accounted for between 19.2% - 41% of cases of SARS
- This is a case-control study of HCWs that were both exposed to SARS at a hospital in Beijing
- Factors increasing risk of infection:
 - o Emergency care >1hr
 - o Contact with respiratory secretions, sputum, other path specimens, and the deceased
 - o Intubation and chest compressions
- Protective factors:
 - o Wearing glasses or protective goggles
 - o Wearing a mask, gloves, and multiple layers of protective gowns
 - o TAKING TRAINING IN INFECTION CONTROL
- PHASE ONE: lack of familiarity and training regarding infection control, and poor set-up of wards and lack of equipment
- LATER PHASE: when staff had adequate training and infection control practices were established and enforced

Preprint: Reasons for healthcare workers becoming infected with novel coronavirus disease 2019 (COVID-19) in China⁵

<https://doi.org/10.1016/j.jhin.2020.03.002>

- Survey of workforce: ~60% nurses, 5.8% had worked during SARS
- Of those infected, 2.7% healthcare workers, compared to 21.1% during SARS
- Contributing factors:
 - o 1. Lack of understanding of pathogen and awareness of importance of PPE
 - o 2. Exposure to large numbers of infected patients
 - o 3. Pressure of treatment, work intensity, lack of rest
 - o 4. Shortage of PPE
 - o 5. Lack of adequate training – difficult to provide systematic training and practice due to emergency response
- Key points: awareness of PPE, sufficient PPE, proper training and preparedness\

Article: Epi of COVID-19 in a long-term. Care facility in King County, Washington⁶

https://www.nejm.org/doi/full/10.1056/NEJMoa2005412?fbclid=IwAR2CZrt0xZOOQM5yA62-tTAiFCGMi4ApCTRdAkEXW8iGveW6k3kErh_ql

Article: SARS and Healthcare Workers⁷

[HTTPS://DOI.ORG/10.1179/OEH.2004.10.4.421](https://doi.org/10.1179/OEH.2004.10.4.421)

****This article provides a good summary of the psychological stress placed on workers during SARS – sounds very very very similar to rhetoric at the moment*

Comment: Staff safety during emergency airway management for COVID-19 in Hong Kong⁸

[https://doi.org/10.1016/S2213-2600\(20\)30084-9](https://doi.org/10.1016/S2213-2600(20)30084-9)

- Outbreak of 167 cases in a long-term care facility, including 50 HCWs and 16 visitors
- Factors that contributed to facility vulnerability:
 - o Staff working in more than one facility
 - o Unfamiliar to PPE recommendations, inadequate supplies of PPE and other items such as hand sanitiser
 - Frequent changes in PPE types due to supply chain disruption – need staff to supervise for proper PPE use
 - o Delayed case recognition due to low index of suspicion, limited tested
- Implemented:
 - o Restricted access for visitors and non-essential personnel
 - o Screening of HCWs via body temp and symptoms
 - o Clinical monitoring of residents, social distancing, reduced resident movement and activities
 - o Infection prevention training and PPE use, contingency plans for acquiring PPE
- Phases of HCW infections throughout the SARS epidemic:
 - o 1. HCWs did not know what they were dealing with → did not have PPE, used nebulised medication
 - o 2. HCWs realised what they were dealing with → used PPE but had inadequate supply, poor ward set-up, and lack of familiarity and training regarding infection-control
 - o Later: non-regular staff caring for SARS patients with little experience, high risk procedures such as intubation, and caring for patients requiring extensive nursing care
- High risk procedures: intubation (particularly with excessive bagging and in ward rather than ICU), nebulised medications
- Required early identification and isolation of patients:
 - o Set-up one floor for triage, other floors or wards as step-down
 - o Teams of doctors and nurses to provide care for patients in designated area
- Facilities either actively or passively conducted surveillance for fever and respiratory symptoms among workers and visitors
 - o SARS screening questionnaire before being permitted – if did not pass screening (Qs or temp. check) → ED
- NIV, HFNC, bag-mask ventilation and intubation are high risk for aerosol generation
- Should be performed in NPIR with correct PPE including double gloving
- Discourage use of NIV or HFNC providing 6L/min or more of oxygen unless have access to NPIR
- Intubation performed by expert with backup airway plans ready
- Reduce time of bag-mask ventilation – if manual bagging is required, supraglottic devices are preferred
- Ensure continuous waveform capnography
- RIS is technique of choice. Rocuronium over suxamthonium may be preferred due to longer half-life - use dose of 1.2mg/kg to achieve onset time similar to suxamthonium

**Report: Quarantine and isolation:
Lessons learned from SARS⁹**

Report to CDC

- (Very large document... relevant bits included)
- Countries had issues with staff reluctance to care for SARS patients, different countries took different approaches
 - o Punishment: Fining staff, firing staff, banning them from continuing practicing medicine...
 - o Incentivising: allowance 5* normal pay, "danger money"
- Many countries had high staff infection rates and nosocomial infection rates, but Singapore instituted:
 - o Stringent temperature checks of all staff and patients → would quarantine staff when clusters of fevers were identified
 - o Use of PPE → use of infection control measures was audited
 - o Isolation of staff working with SARS
 - o No visitors, except one for paediatrics and one for obstetrics (videoconferencing)
 - o Dedicated ambulances for suspected and probable cases – also used to pick up patients from quarantine who had gone on to develop SARS symptoms
 - o Had designated SARS treatment hospital

**Guideline: COVID-19 – Infection
Prevention and Control in the
Hospital Setting (WA Health)¹⁰**

<https://ww2.health.wa.gov.au/~media/Files/Corporate/general%20documents/Infectious%20diseases/PDF/Coronavirus/Infection%20Prevention%20and%20Control%20in%20Hospitals.pdf>

- Dedicated teams of staff should manage the suspected or confirmed case to minimise risk to other HCWs and patients
 - o Ensure consideration of rostering to avoid fatigue of HCWs
 - o Maintain a log of all staff entering the room or area of suspected or confirmed cases
- Reduce number of staff potentially exposed to suspected or confirmed cases – ensure administrative, research or other non-clinical staff are segregated away from patients
- Avoid wearing uniforms home – launder uniforms at the facility
- Consider staff at higher risk of severe COVID19 infection, including: pregnant staff, chronic respiratory conditions, morbidly obese, chronic illness (cardiac disease, DM, CKD, immunosuppression, chronic neuro conditions)
- HCWs using correct infection control measures and PPE whilst caring for a confirmed case are NOT considered close contacts unless there was a breach of PPE
- If a HCW develops signs and symptoms of acute illness, fever, cough or SOB, they should:
 - o Cease work, or not turn up to work
 - o Contact their manager and infection control
 - o Seek medical attention

**Comment: Initiation of a new
infection control system for the
COVID-19 outbreak¹¹**

[https://doi.org/10.1016/S1473-3099\(20\)30110-9](https://doi.org/10.1016/S1473-3099(20)30110-9)

- Development of an innovative **observational infection-control system** for negative pressure (NP) isolation wards
- Always a risk of HCWs not being fully aware of exposure whilst caring for patients
- Cameras – cover the entire ward except privacy areas
- Observer monitors all HCWs in real-time via computer monitors in a separate area, but maintains communication with staff
- Infection control observers – underwent intensive training of infection control requirements; role is to:
 - o Maintain normal operation of NP ward, supervise disinfection, ensure sufficient supply of equipment, arrange for specimens for inspection, and relieve anxiety of HCWs caring for patients
 - o Also supervise donning and doffing

Preprint: Preventing intra-hospital infection and transmission of COVID19 in healthcare workers¹²

<https://doi.org/10.1016/j.shaw.2020.03.001>

- All HCWs should have attended multiple training sessions and drills, however, steps may be omitted or overlooked
- Allows for real-time feedback to staff, problem-solving, and risk assessment for staff - prevent nosocomial infection

- Report of Singapore's strategy to aim for zero occupational infections using root cause analysis
- 1. Segregation of healthcare teams caring for suspect and confirmed cases of COVID19, vs teams caring for others
- 2. Tasks should be risk-stratified to determine the appropriate PPE for the worker
 - o Eg. AGPs (full PPE including eye protection and respirator), vs triaging at fever clinic
- 3. Rapid testing to ensure early identification and segregation of patients (RT-PCR in 3-4hrs)
- 4. Twice daily temp. monitoring for all HCWs
 - o Government developed IT platform for HCWs to log details, symptoms and temperature recordings remotely
 - o Temp. above 37.5 dC is followed up by hospital clinical epi team
- 5. Suspend cross-institutional coverage by medical staff – limit practise to one primary institution
 - o Keep care teams small, meal-times are staggered, teaching and meetings via videoconferencing
 - o Medical students withdrawn from clinical attachments
- 6. Avail manpower and PPE for frontline work
 - o Learning from SARS, Singapore had a stockpile of PPE
- 7. Ensure clear and timely communications to staff – enables their work and interactions with the public
- 8. Clear directions from leadership and collaborative team spirit
 - o Acknowledge increased work hours, increased stress and risk, and fatigue from regular donning and doffing
 - o Peer support programs, facilitate senior workers to provide encouragement, self-care tips and psychological first aid
- 9. All visitors and outpatients to undergo screening questionnaire and thermal scanning for fever, and reduced visitors

Preprint: Escalating infection control response to the rapidly evolving epidemiology of the COVID-19 due to SARS-CoV-2 in Hong Kong¹³

<https://doi.org/10.1017/ice.2020.58>

- **Use of increased level of PPE for all AGPs** (ie. To airborne precautions) - even if w/o features or epi risk factors for COVID19
- Use of surgical masks by all HCWs, patients and visitors, increased hand hygiene
- Important to note the viability of SARS-CoV-2 → SARS-CoV had viability on smooth surfaces for up to 5 days
- **Quarantine of HCWs for 14 days following unprotected exposure**

Preprint: Epi, Clinical Characteristics and Outcome of Medical Staff infected with COVID-19 in Wuhan, China: A Retrospective Case Series Analysis¹⁴

<https://www.medrxiv.org/content/10.1101/2020.03.09.20033118v1>

- Analysis of 64 confirmed cases of COVID-19 in staff in Wuhan, China.
- 67% nurses
- 5% had contact w/ specimens, 8% fever clinics, 5% isolation wards
- **Fever most common symptoms (67%)**, cough 47%, fatigue 34%
 - o Others: sore throat, myalgia, chest tightness, sputum, headache, chill, decreased appetite, diarrhoea, chest pain
- **Majority of staff infected in China were in early stages of the outbreak, when there was lack of knowledge regarding transmission and experience.**

Article: *The incubation period of COVID-19 from publicly reported confirmed cases: estimation and application*¹⁵

10/03/20

Nice simple summary

<https://annals.org/aim/fullarticle/2762808/incubation-period-coronavirus-disease-2019-covid-19-from-publicly-reported>

Preprint: *Epidemiology and transmission of COVID-19 in Shenzhen China: Analysis of 391 cases and 1,286 of their close contacts*¹⁶

<https://doi.org/10.1101/2020.03.03.20028423>

Article: *Clinical characteristics of hospitalised patients with SARS-CoV-2 infection: A single arm meta-analysis*

<https://onlinelibrary.wiley.com/doi/10.1002/jmv.25735>

Article: *SARS-CoV-2 and COVID-19: The most important research questions*¹⁷

- **“... hospital-related transmission is not the main transmission feature of COVID-19 in China. Our findings advocate this viewpoint.”**

- Pooled analysis of 181 confirmed cases with known exposure and symptom onset windows
- Median incubation 5.1 days (95%CI; 4.5-5.8)
- 97.5% develop symptoms within 11.5 days
 - **“[we] expect that nearly all infected persons who have symptoms will do so within 12 days of infection.”**
 - Only 101 out of 10 000 cases will develop symptoms after 14 days of monitoring
- Exclusion of cough or sore throat → median incubation to onset of fever 5.7 days (4.9 – 6.8)
 - 97.5% have a fever within 12.5 days
- Analysis of 391 cases of COVID19 in Shenzhen and their close contacts (lived in the same apartment, meal, travel, social)
 - Casual contacts (other clinic patients) and close contacts wearing a mask were not included
 - Close contacts were isolated and monitored for 14 days, with PCR tests at the beginning and end of isolation
 - Compared to symptom surveillance at travel hubs and homes
- Median incubation 4.8 days, 95% who develop symptoms, will do so in 14 days
- Median time to recover 22 days in 50-59 yr age group
- Secondary attack rate for household contacts of 15.8% (95%CI12.9,19.4), and 10.3% (8.4,12.6) overall
 - Rate of infection for those under 10yrs was similar to the general cohort population (7.4 vs. 7.9%)
- Contact-based surveillance reduced days from symptom onset to isolation 2.2 days (95%CI:1.7,2.6), compared to 3.4 days for symptom-based surveillance (3.1,3.7)
- Using data from contact-based surveillance, 19.5% were asymptomatic, and 28.7% were afebrile at time of the positive PCR
- **“This work further supports the picture of COVID-19 as a disease with fairly short incubation period (4-6 days) but a long clinical course...”**
- Meta-analysis of clinical characteristics of patients with SARS-CoV-2 infection (no specification of when during infection):
 - Fever 89%, Cough 72%, Muscle soreness or fatigue 43%
 - ARDS 15%, Abnormal chest CT 97%
 - Severe cases 18%, case fatality 4.3%
- Absence of fever in SARS-CoV2 infection is more common (~12%) compared to SARS (1%) and MERS (2%)
 - Changes effectiveness of fever surveillance
 - Also unclear viral load and shedding meaning timeline of infectious is unknown
- For SARS, a highly sensitive case definition was used with a focus on fever or respiratory Sx with epi link

Comment: Can we contain the COVID-19 outbreak with the same measures as for SARS?¹⁸

[https://doi.org/10.1016/S1473-3099\(20\)30129-8](https://doi.org/10.1016/S1473-3099(20)30129-8)
<https://dx.doi.org/10.1186%2Fs13578-020-00404-4>

Article: Quantitative evaluation of infection control models in the prevention of nosocomial transmission of SARS virus to healthcare workers: Implication to nosocomial viral infection control for healthcare workers¹⁹

<https://doi.org/10.3109/00365540903582400>

Article: Preparing for a COVID19 pandemic: a review of operating room outbreak response measures in a large tertiary hospital in Singapore²⁰

<https://link.springer.com/article/10.1007/s12630-020-01620-9#citeas>

Good article - not fully summarised here

Article: Estimated effectiveness of symptom and risk screening to prevent the spread of COVID-19²¹

- Strict PPE use, restricted visitors and staff movement
- Separate triage facilities for those with fever or Sx
- All workers required to use PPE and N95 or all patients, irrespective of if SARS was suspected or not
- Temperature screening twice daily for HCWs → if positive, isolated until ruled out
- Beijing rapidly built SARS hospitals
- For COVID19 → concerns regarding asymptomatic or pre-symptomatic transmission
 - Mild disease, and potential asymptomatic spread makes control more difficult

- Time-dependent analysis of nosocomial infection in HCWs in 16 hospitals in Taiwan following SARS
- Evaluated effectiveness of five interventions:
 - Triage of patients with fever of unknown etiology outside ED (before entry) → then zoned according to risk
 - Installation of hand washing stations in ED
 - Implementation of routing from ED to isolation ward
 - Fever screening station outside ED
 - Hand washing stations throughout the hospital
- Triage of patient with fever of unknown etiology outside ED (traffic bundling) was most effective
- HCWs were at highest risk of nosocomial infection with SARS in ED – isolating patients early was most effective

- Review of preparation of a large hospital in Singapore (1700 beds)
- Reduced elective surgery
- Screened all patients presenting to hospital with screening questionnaire → all who had suspected COVID19 were isolated and tested
- Restricted visitors, staff asked to stop unnecessary travel
- Temp of staff screened twice daily → entered into electronic records using web-based forms → could be accessed via smartphone → if Sx developed, screened at staff clinic
- Staff resources were made available, including a helpline to reduce burnout and anxiety
- Three separate ORs for suspected or confirmed cases – separate from main complex
- Clear signage and instructions for donning and doffing
- Training for PPE use and PAPR, all fit-checked for respirators, given personal goggles
- Postoperative visits were conducted via phonecall
- For all teams caring for a COVID19 patient in theatre, an OR coordinator was assigned and oversaw allocation of roles and infection prevention

- Modelling of traveller arrival screening (just summarised relevant points)
- Must consider:
 - Incubation period - time period since exposure (med. ~5.5)
 - Subclinical cases (no fever or cough) – particularly children/teens (best case scenario 5%, middle 25%, worst 50%)

<https://dx.doi.org/10.7554%2FeLife.55570>

POTENTIAL ASYMPTOMATIC TRANSMISSION

Article: **Diagnosis and clinical management of severe acute respiratory syndrome Coronavirus 2 (SARS- CoV-2) infection: an operational recommendation of Peking Union Medical College Hospital (V2.0)**²⁵

<https://www.tandfonline.com/doi/pdf/10.1080/22221751.2020.1735265?needAccess=true>

Guideline: **The Australian and New Zealand Intensive Care Society (ANZICS) – COVID19 Guidelines (Version 1)**²⁶

<https://www.anzics.com.au/wp-content/uploads/2020/03/ANZICS-COVID-19-Guidelines-Version-1.pdf>

- Sensitivity of thermal scanners (if used)
- Truthfulness of reporting symptoms on questionnaires
- Screening failure arises primarily from undetectable cases
- There is evidence of **viral load and positive RT-PCR, BEFORE symptomatic illness**²²
 - Viral load of asymptomatic patients may be similar to that of symptomatic patients, which suggests transmission may occur from asymptomatic or minimally symptomatic patients²³
- Evidence from the Diamond Princess cruise ship showed the estimated asymptomatic proportion was 17.9% (95%CrI15.5-20.2)²⁴
-
- Nice succinct summary of pre-COVID19 staff testing and exclusion criteria, investigations that should be performed on presentation and when diagnosis confirmed.
- Patients **tested for COVID19 – single room isolation**
- Confirmed diagnosis – transfer to **designated COVID19 hospital**
- Simple and clear operational guidelines for ICUs, including: reducing ICU demand, increasing ICU capacity, decision making, infection control, and treatment of COVID19 patients
- Recommend:
 - Clean scrubs to be changed into before each shift
 - Showering facilities at the end of each shift
 - Provision of meals and drinks for frontline staff
- Consider:
 - Staff temperature and symptom checks at the start of each shift
 - Dedicated roster of “clean teams” and “COVID19 teams”

Risk factors for severe disease and poor prognosis

SOURCE	SUMMARY
<p><i>Letter/comment: Characteristics of and important lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China</i>²⁷</p>	<ul style="list-style-type: none"> - Descriptive study of 72 314 COVID19 patients from mainland China - Severity: 81% mild, 14% severe, 5% critical - Case fatality rate (CFR): 2.2% overall, 14.8% of those ≥80yrs, 49.0% in critical - Healthcare personnel infection rate: 3.8% - Risk factors for severe disease: <ul style="list-style-type: none"> o Increasing age (70-79yrs CFR 8.0%) o Cardiovascular disease CFR 10.5% o Diabetes CFR 7.3% o Chronic respiratory disease CFR 6.3% o HTN 6.0% o Cancer 5.6%
<p><i>Article: Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China</i>²⁸</p> <p>https://www.thelancet.com/journals/lancet/article/piiS0140-6736(20)30183-5/fulltext</p>	<ul style="list-style-type: none"> - Descriptive study of 41 confirmed cases of COVID19 in Wuhan - six deaths (15%) - Sx at onset: fever 98%, cough 76%, myalgia or fatigue 44%, sputum 28%, headache 8%, haemoptysis 5% - 55% developed dyspnoea, median duration from illness onset to dyspnoea of 8.0 days - Median time from onset to admission of 7.0 days, 9.0 days to ARDS, 10.5 days for ICU admission and mechanical ventilation - All had CT abnormalities on admission (commonly bilateral ground-glass opacities and subsegmental consolidation) - Complications: all had pneumonia, 29% ARDS, 12% acute cardiac injury, 10% secondary infection - 5% refractory hypoxaemia with ECMO salvage
<p><i>Article: Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study</i>²⁹</p> <p><i>(Very helpful overview)</i></p> <p>https://doi.org/10.1016/s0140-6736(20)30566-3</p>	<ul style="list-style-type: none"> - Descriptive study of 191 confirmed cases of COVID19 in Wuhan – 54 deaths (2.8%) - Factors associated with increased risk of mortality: <ul style="list-style-type: none"> o Age, HTN, diabetes, coronary artery disease, chronic obstructive lung disease, chronic kidney disease o On admission: D-dimer >1ug/mL, higher SOFA, elevated cardiac troponins, elevated LDH, lymphopaenia - Sx on admission: fever 94%, cough 79%, sputum 23%, myalgia 15%, fatigue 23% - Disease severity: 35% severe, 11% critical - Median time from onset to admission of 11.0 days, med. time to ventilation 14.5, med to death 18.5 days <ul style="list-style-type: none"> o ECMO used in three – none survived - Imaging features: consolidation 59%, ground-glass opacities 71%, bilateral infiltrating pneumonia 75% - Complications: sepsis 59%, resp failure 54%, ARDS 31%, heart failure 23%, septic shock 20%, coagulopathy 19%, AKI 15%

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