



CENTRE OF EXCELLENCE IN
SEVERE ASTHMA

Innovative solutions for severe asthma



Version 2

7th May 2021

CLINICAL RECOMMENDATIONS FOR COVID-19 IN SEVERE ASTHMA

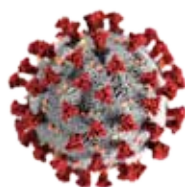
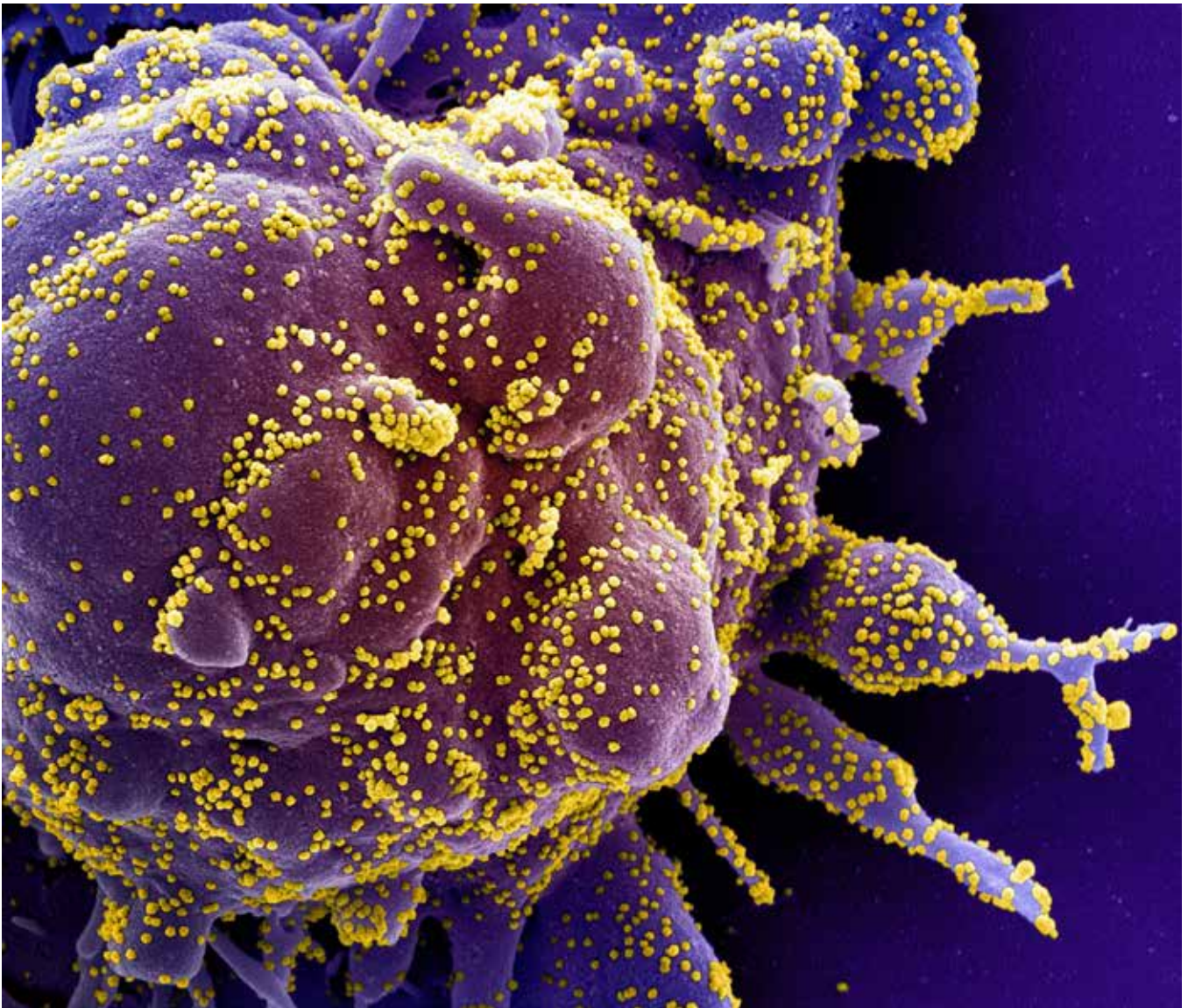


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1. COVID-19 INTRODUCTION

The world is experiencing a COVID-19 pandemic, leading to significant illness and social and economic hardship.



Colorized scanning electron micrograph of an apoptotic cell (purple) heavily infected with SARS-COV-2 virus particles (yellow), isolated from a patient sample. Image captured at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIAID

FAST CLINICAL FACTS

THE VIRUS

- Coronavirus disease 2019 (COVID-19) is a viral illness caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).
- SARS-CoV-2 is a positive-stranded RNA virus, genetically related to SARS-CoV-1 that caused the severe acute respiratory syndrome (SARS) outbreak in 2002 [1]. The original, likely animal source of the virus is yet to be identified.
- The viral cell entry process is initiated when the SARS-CoV-2 spike protein binds to the cellular receptor angiotensin-converting enzyme 2 (ACE2) [3], a cell membrane protein expressed in the lungs, heart, kidneys, intestines and oral and nasal mucosa. Following cell entry and replication of the viral genome, progeny virus are assembled and released, spreading the infection to nearby cells.



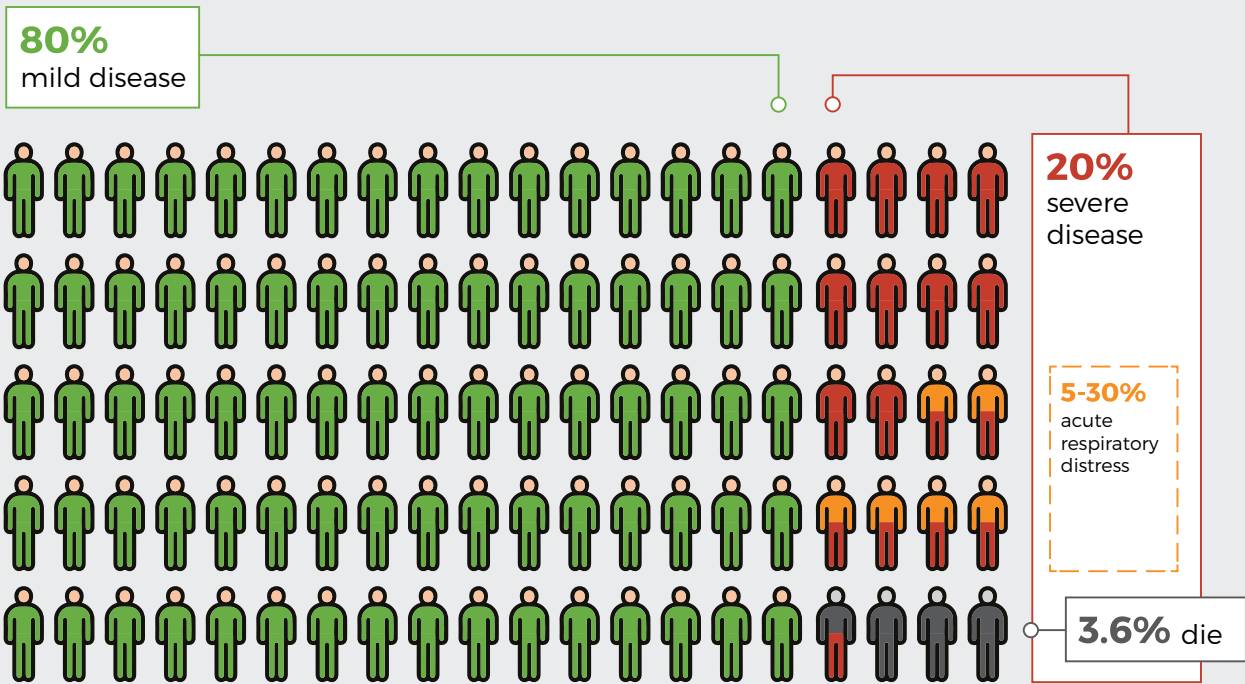
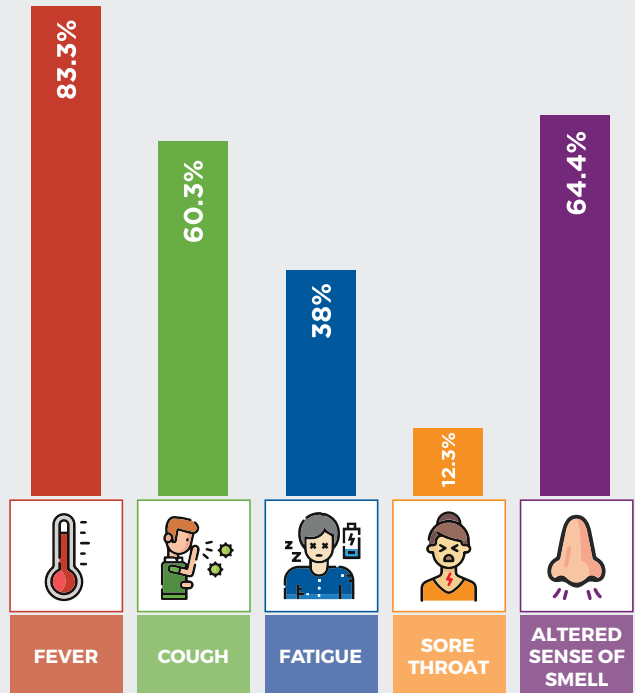
Transmission electron micrograph of SARS-CoV-2 virus particles, isolated from a patient. Image captured and colour-enhanced at the NIAID Integrated Research Facility (IRF) in Fort Detrick, Maryland. Credit: NIAID

TRANSMISSION

- SARS-CoV-2 is highly contagious in humans. At present, it is believed that the virus is transmitted via contact with respiratory droplets from inhalation, contaminated hands, or surfaces. Respiratory droplets are generated from an infected person by coughing, exhalation or with nebulisation therapy. Respiratory droplets may spread up to at least a 1 metre [4] (WHO).
- The half-life of respiratory droplets containing SARS-CoV-2 respiratory droplets is between 1.1 and 1.2 hours after nebuliser generation [5]. Viral particles may deposit on surfaces and remain viable [6]. The half-life varies depending on the surface, ranging from 5.6 hours on stainless steel, 6.8 hours on plastic, and noticeably shorter on cardboard and copper surfaces.
- The period of infectivity is not yet known. Some people are asymptomatic and in others, SARS-CoV-2 may be detected before they develop respiratory symptoms. At present, it is considered that a person may be infectious for at least 1-2 days prior to the development of symptoms, and during the symptomatic period.
- The incubation period, from time of exposure to development of symptoms, is estimated to be approximately 5 days, with reported ranges from 1-14 days.

SYMPTOMS AND IMPACT

- COVID-19 causes a respiratory illness with the most common symptoms being fever (83%), cough (60%), sore throat (12.3%) and fatigue (38%) [7, 8]. Early during infection, people may experience alteration in taste and smell [9].
- Some people can be infected with SARS-CoV-2 and report no symptoms (asymptomatic infection; median 5.6%, range reported 1.4-11.6%;[7]).
- The illness may progress to viral pneumonia, and can then progress to acute respiratory failure from acute respiratory distress syndrome (ARDS) after a median of 8.5 days.
- Viral pneumonia is detected as frosted glass opacification in lung regions on CT scanning in 80% (67-90%) of cases.
- With the development of ARDS, bilateral consolidation and progressive hypoxaemia develop.
- Monitoring respiratory rate and pulse oximetry are key parameters to assess in surveillance of COVID-19 positive patients.
- Most people have mild or moderate disease severity. Severe COVID-19 disease occurs in up to 25% of infected people, ARDS occurs in between 5 and 30% of this population. The disease is estimated to be fatal in 3.6%. Mortality rates vary according to the extent of testing of symptomatic patients.
- Characteristic blood changes with COVID-19 include lymphopenia and eosinopenia [7, 12], elevation in C-reactive protein, lactate dehydrogenase and d-dimer [13]
- People with chronic respiratory diseases have reduced respiratory reserve, and may experience a more severe clinical illness if infected with COVID-19.



2. SEVERE ASTHMA AND COVID-19

Severe asthma is asthma that remains uncontrolled despite treatable factors having been addressed and maximal inhaled therapy being taken regularly.

2.1 RECOMMENDATIONS FOR MANAGEMENT AND ISOLATION

People with asthma should continue maintenance treatment as prescribed during periods of stable asthma. This is highly important as having poorly controlled asthma puts patients at risk. People should continue prescribed treatment with inhaled corticosteroids.

2.2 MANAGEMENT OF ASTHMA ATTACKS

Ensure all patients with asthma have an up-to-date written asthma action plan and are able to access the treatment recommendations included in that plan. Clinicians and patients may have heard conflicting/alarming statements about the use of oral corticosteroid (OCS) in patients with COVID 19; the concerns mentioned by CDC and WHO relate to use of systemic corticosteroids for treatment of ARDS, based on studies of SARS, MERS and influenza [18].

People with severe asthma who require OCS either as maintenance or for management of acute attacks should continue to take these treatments as prescribed. It is essential that patients should not stop oral or inhaled asthma medications without first discussing it with their healthcare provider.

For further information and written asthma action plan templates consult <https://toolkit.severeasthma.org.au/management/written-action-plans/>

2.3 ISOLATION RECOMMENDATIONS

Even though people with asthma do not appear to be at greater risk of COVID 19 infection [12, 19], those with severe or uncontrolled disease could experience more severe illness burden should they be infected by the virus [20]. We therefore recommend that when there is community transmission **people with severe asthma self-isolate and practice physical distancing** including from household occupants. This also includes the recommendation of staying at home unless it is essential, including working from home. Tips on maintaining wellness, a healthy balance and social interactions are provided in section 5.

To ease the burden faced by people with severe asthma from their employment perspective we recommend that health care providers issue patients with a personalised letter explaining the recommendations for self-isolating, given the increased risk of poor outcomes for the individuals.

During the period of community containment, we also recommend the use of telehealth for patient appointments unless face to face assessments are absolutely necessary (see section 3 on monoclonal antibodies administration).

During these assessments, ensure that individuals are continuing to take their usual asthma medications, that they have an up-to-date written asthma action plan for management of worsening asthma and that they are aware of the need to implement such plans including the use of oral corticosteroids should the clinical need arise.

The image shows a template for an Asthma Action Plan. It is a blue and white form with sections for 'WHEN WELL', 'WHEN NOT WELL', and 'IF SYMPTOMS GET WORSE'. Each section has fields for medication names, doses, and frequencies. There are also checkboxes for 'Other instructions' and 'Contact your doctor'. At the bottom, there is a red 'DANGER SIGNS' section with a 'DIAL 000 FOR AMBULANCE' button. The National Asthma Council Australia logo is in the bottom right corner.

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WHEN THERE IS ACTIVE
COMMUNITY TRANSMISSION
STAY AT HOME
AS MUCH AS POSSIBLE

IF YOU MUST GO OUT STAY 1.5 METRES AWAY
FROM OTHERS



The table below highlights isolation recommendations for people with severe asthma **when there is active community transmission** in the context of COVID-19, compared to people with mild to moderate disease.

Recommendation	Mild Asthma	Moderate Asthma	Severe Asthma
In the community	Practice physical distancing according to the recommendations for the general community.	Practice physical distancing according to the recommendations for the general community and consult a health care professional for further guidance.	Self-Isolation. Stay at home unless absolutely necessary. Practice physical distancing. Wearing a face mask is recommended in areas where community transmission of COVID-19 and physical distancing is not possible.
Work	If your asthma is well controlled follow recommendations for the general community.	Consult health care professionals to discuss work place suitability, consider changing role within organisation so there is less contact with general public.	Work from home.

Some patients with severe asthma may be classed as essential workers, including health care professionals. We recommend that these individuals continue to practice the self-isolation recommendations for severe asthma.

3. ACCESSING AND ADMINISTERING MONOCLONAL ANTIBODY THERAPY

Patients with severe asthma who are prescribed monoclonal antibodies (mAbs) should continue to receive this treatment. There is no evidence to suggest that asthma or monoclonal antibody therapy constitute an increased risk for acquiring COVID-19 or for more severe disease, if acquired [21, 22].

Changes to the model of health care delivery are necessary to limit the spread of COVID-19 and to aid in providing 'surge capacity' at public hospital facilities, such as ambulatory care clinics. This will limit or preclude face-to-face visits for clinical assessment and for mAb administration, particularly in areas of active community transmission. Several options are available to deal with this:

- Use of telehealth or telephone consultation to conduct clinical assessments, including mAb continuation assessments
- mAb administration at the GP surgery, via a nurse visit, or self-administration by the patient [see below, transferring mAbs to the community]
- Initiation of mAbs for severe asthma: this will remain a clinical requirement during the COVID-19 pandemic.

TRANSFERRING mAb ADMINISTRATION TO THE COMMUNITY

- Transfer to GP
 - o This is suitable for Nucala, Fasentra, Xolair, and Dupixent
- Nurse administration programme supported by Pharmaceutical company
 - o This is suitable for Nucala via Nucala patient support programs (PSPs), Phone 1800 682 252 (In Australia) and Fasentra via Connect360, email: support@connect360asthma.com.au
- Self-injection
 - o This is suitable for Fasentra, Nucala, Xolair, and Dupixent

EXAMPLE OF MONOCLONAL ANTIBODY THERAPY ADMINISTRATION DURING COVID-19

John Hunter Hospital, Newcastle

After the first injection the patient is referred to the relevant patient support program (PSP) or to their GP. Support materials are an introductory letter, an information pamphlet and check that the patient's written asthma action plan is up to date and provision of information about the Rapid Access Clinic.

We ensure that patients have a 3 month consultant review and 6 month continuation appointment which are scheduled to occur via telehealth.

For continuation assessments a telehealth phone appointment is conducted. The Asthma Control Questionnaire is completed over the telephone. The completed and signed application and prescription is then submitted via the health professionals online services provider digital access (PRODA) account. The prescription is then posted to the patient or the patients' pharmacy after approval numbers and PBS Item numbers are transcribed onto the hard-copy.

4. DRUGS AND DEVICES COMMONLY USED IN SEVERE ASTHMA MANAGEMENT

4.1 VACCINATIONS

COVID-19 VACCINATIONS

We recommend that all people >16 years, including those with asthma, receive a vaccination against COVID-19.

For patients using monoclonal antibody therapies for asthma (omalizumab, mepolizumab, benralizumab and dupilumab), the dose should not be administered on the same day as a COVID-19 vaccine, if possible, so that if adverse effects occur the cause will be easier to identify. The initiation of new monoclonal antibody therapies should be avoided for 14 days following the COVID-19 vaccine.

For more information on the roll out and clinical guidance of the vaccine in Australia, and to check current eligibility please see:

<https://www.health.gov.au/initiatives-and-programs/covid-19-vaccines/getting-vaccinated-for-covid-19/when-will-i-get-a-covid-19-vaccine>

In Australia there are two vaccines available, Comirnaty (Pfizer Australia Pty Ltd) and the COVID-19 Vaccine AstraZeneca (AstraZeneca Pty Ltd). Both vaccines have been deemed efficacious against symptomatic COVID-19 and have a good safety profile in the clinical trials.

Co-administration of COVID-19 vaccine with other vaccines is not recommended. A minimum 14-day interval is advised between administration of a COVID-19 vaccine and any other vaccine, including influenza vaccine.

For more information on vaccines please see: <https://www.health.gov.au/resources/publications/covid-19-vaccination-atagi-clinical-guidance-on-covid-19-vaccine-in-australia-in-2021>

OTHER VACCINATIONS AGAINST RESPIRATORY VIRUSES

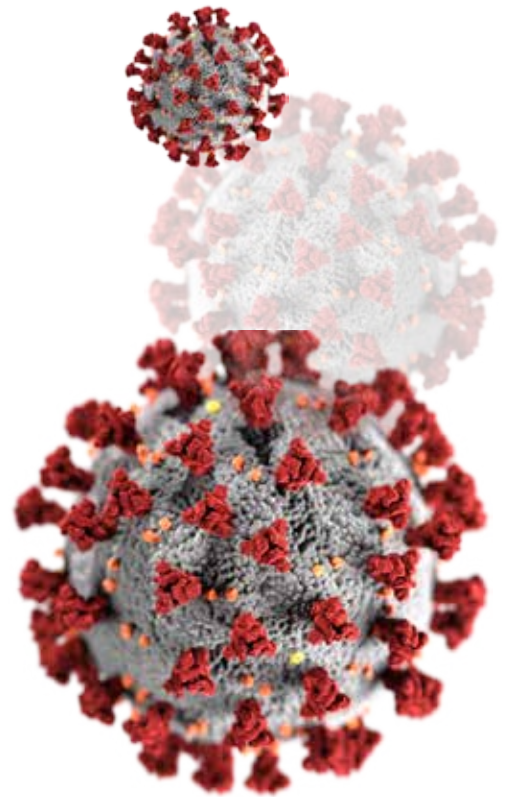
The Australian Government Department of Health recommends immunisation with the annual influenza vaccine. Whilst this vaccine will not protect patients from contacting COVID-19, it will protect from complications of influenza. We recommend patients with severe asthma receive this immediately, in accordance with the above information.

The World Health Organisation has issued a statement indicating that vaccines against pneumonia, such as pneumococcal vaccine do not provide protection against COVID-19. However, as with the influenza vaccine, pneumococcal vaccine is recommended to protect overall respiratory health in older people and people with severe asthma.

4.2 DELIVERY OF ASTHMA MEDICATION BY AEROSOL

It is recommended that inhaled asthma medications be delivered by metered dose inhaler, either as a pressurised inhaler, with or without a valved holding device (spacer), or as a dry-powder inhaler. All patients must have and use their own devices (such as inhalers and spacers) and should not be sharing with anyone, including other family members. Nebulised treatment is to be avoided because of the risk of infection transmission.

The procedures in 4.3 may increase the likelihood of spread of respiratory viruses, including SARS-COV2 but that this will be depend on local community transmission



4.3 NEBULISERS, HIGH FLOW OXYGEN, NON-INVASIVE VENTILATION (CPAP, BI-LEVEL PAP), SPUTUM INDUCTION AND COUGH DEVICES

Some respiratory therapies and devices (Nebulisers, high flow oxygen, non-invasive ventilation (CPAP, Bi-level PAP), sputum induction and cough devices) can produce aerosols that may contain virus particles if they are used in patients with COVID-19 [23]. Therefore the use of these devices, including nebulisers, creates a significant risk of exposure to aerosol particles of the SARS-CoV-2 virus for health care workers, patients and relatives [23, 24]. In people on devices such as CPAP or NIV it is **not** recommended that they cease the use these treatments in their homes, but if they have COVID-19, infection control measures should be undertaken to protect other household members. However, if used in hospital, appropriate airborne and contact precautions need to be taken.

The use of nebulisers for treatment and sputum induction should be avoided. It is recommended that puffers and spacers be used instead of nebulisers [23, 24].

Where the use of these therapies and devices cannot be avoided, airborne and contact precautions are required for a minimum of 30 minutes after the cessation of the procedure [25].

High flow oxygen includes oxygen therapy delivered via

- Hudson Mask (> 8 L/min)
- Venturi Mask (3-15 L/min)
- High flow nasal cannulae (20-80 L/min)

Please refer to these links for specific guidance on infection control procedures for aerosol precautions including the management of aerosol generating physiotherapy procedures

<https://covid19evidence.net.au>

<https://www.health.nsw.gov.au/Infectious/covid-19/Pages/high-risk-interventions-respiratory-physiotherapy.asp>

4.4 SPIROMETRY

The peak respiratory bodies in Australia and New Zealand have guidelines for the suitability of pulmonary function testing. These are updated in accordance with the current COVID-19 situation. Please refer to these guidelines for current advice <https://www.thoracic.org.au/> and <http://covid19evidence.net.au>.

4.5 INHALED CORTICOSTEROIDS

It is important for patients who are prescribed inhaled corticosteroid therapy to continue this treatment to ensure good asthma control. Currently there is no evidence to suggest that inhaled corticosteroid treatment increases the risk of acquiring COVID-19 [26]. In addition inhaled corticosteroids may be protective against the requirement of urgent medical care as well as reducing time to recovery if administered during early COVID-19 infection [27].

Stopping inhaled corticosteroids can increase the risk of a severe asthma attacks, including attacks which may be caused by a viral illness [24].

4.6 ORAL CORTICOSTEROIDS

Oral corticosteroids are commonly used in the treatment of severe asthma attacks and as part of maintenance therapy. If a course of oral corticosteroids is clinically indicated for treatment of an asthma attack, it should **not** be withheld [18, 24, 26]. In addition, patients should continue to take oral corticosteroids as prescribed as suddenly stopping these treatments can be harmful [26].

ORAL CORTICOSTEROID USE FOR COVID-19

The World Health Organisation recommends the use of systemic corticosteroids therapy for 7-10 days for severe and critical COVID-19 [28]. Systemic corticosteroid therapies are not recommended in non-severe cases of COVID-19, unless they are indicated for another reason such as an attack of asthma [18].

A critical case of COVID-19 is defined by the criteria for acute respiratory distress syndrome, sepsis, septic shock, or other conditions that would require the provision of life sustaining therapies, such as mechanical ventilation or vasopressor therapy. Severe COVID-19 is defined as oxygen saturations below 90% on room air or respiratory rate greater than 30 breaths per minute in an adult or signs of respiratory distress, such as accessory muscle use or inability to speak in full sentences.

5. SEVERE ASTHMA, COVID-19 AND WELLBEING

5.1 STRESS AND ANXIETY IN PATIENTS WITH SEVERE ASTHMA

- It is important to recognise the potential adverse mental health effects of the COVID-19 pandemic for patients with severe asthma. These adverse effects may be short-lived or continue beyond the pandemic.
- Stress, anxiety and depressed mood may be intensified in people with severe asthma. People with severe asthma may:
 - Experience fears and worries shared by the general community about the health, social and economic implications of the virus.
 - Experience fears and worries unlike the general community, related to being at potentially high-risk of experiencing serious complications from COVID-19, conflicting advice regarding medication use and reduced access to medication.
- Some stress or anxiety at a time like this is normal. It becomes problematic when it interferes with an individual's ability to function or causes distress.
- Generally, anxiety and depression are associated with adverse health and functional outcomes in severe asthma.[31, 32]
- Symptoms of a panic attack and asthma attack can overlap, so it can be difficult for patients to distinguish. Overlapping symptoms include shortness of breath, chest tightness and feeling anxious. Signs specifically of an asthma attack may be cough, wheeze, and low peak flow. Signs more related to panic attack may be hyperventilation, dizziness, tingling, nausea and cramps.
- For more information on anxiety and depression in severe asthma, including how to distinguish between an asthma attack and a panic attack, please see the Severe Asthma Toolkit (<https://toolkit.severeasthma.org.au/co-morbidities/extra-pulmonary/anxiety-depression/>)

5.2 STRESS AND ANXIETY BEHAVIOURS DURING PANDEMICS

- People may seek *information* and *agency* to try to allay their anxiety.
- Seeking information might involve seeking news and data, reassurance from others, social media for information, medical appointments and virus testing.
- Seeking agency means people want to do something to alleviate their fear, for instance by avoiding situations, seeking “quack cures”, disinfecting, or even acting as if they won't be affected at all.
- People may benefit from limiting their information to one or two trusted sources.
- Health care professionals can discuss and review with their patients strategies for managing their severe asthma when they are feeling stressed, and reviewing (and possibly revising) their written asthma action plan in light of the current circumstances of the pandemic. Health care professionals can also emphasise that staying home is contributing to fighting the virus. These steps will help to provide patients with a sense of agency.

5.3 TOP TIPS FOR MAINTAINING GOOD MENTAL HEALTH [33-35]

SOCIAL CONNECTEDNESS

- Maintaining a sense of social connectedness during times of isolation is particularly important. Research indicates that increased social connectedness buffered negative effects on wellbeing during the SARS pandemic in Hong Kong.[36] Connect with others through telephone, video chat or online.

CONTROL MEDIA INTAKE

- Limit media exposure, as this can increase stress, anxiety, depression and isolation.
- Seek one or two trusted resources for information, think critically and check facts.

ACTIVELY MAINTAIN WELLBEING

- When feeling overwhelmed, focus on “controlling the controllables”. That is, focus on doing the things that are under your control, such as following expert advice, practicing good hygiene and adjusting your attitude.
- Find a routine, keep busy, do activities you enjoy at home or try something new.
- Keep perspective, manage expectations and make positive future plans.
- Stay physically active, eat nutritious foods and monitor alcohol intake.
- Seek professional support when needed (see the Resources Supplement).

5.4 PHYSICAL ACTIVITY

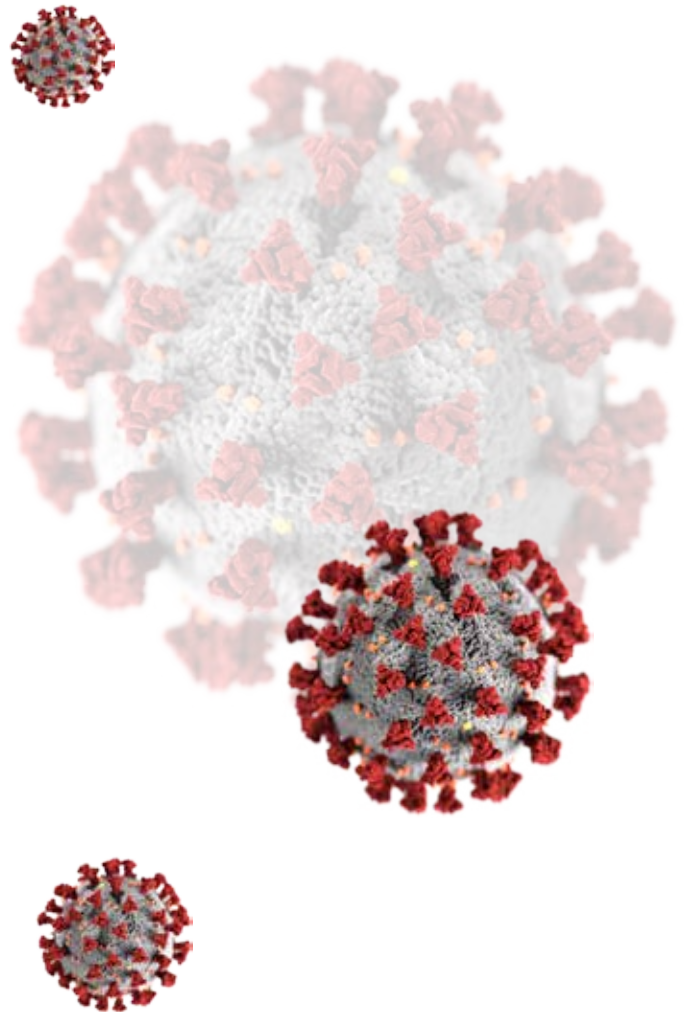
- Physical activity keeps you busy and benefits mental and physical health.[37, 38] For example, fatigue is common during periods of stress. Being physically active can improve fatigue over time.[39]
- Australian Government physical activity recommendations are to be active most days, if not every day, each week. [40] The recommendations for adults is to accrue at least 150 minutes of moderate-vigorous activity per week [40]. People with severe asthma should work toward this goal as able. Australian data indicates that the median moderate-vigorous activity level in people with severe asthma is 22 minutes/day, which equates to 154 minutes per week [41]. This shows that the physical activity targets are realistic goals for many people with severe asthma.
- Maintaining physical activity can be challenging when isolating, as incidental exercise may decrease.
- Find a home-based activity to work into a routine. Some suggestions may be online programmes of yoga or tai chi, or walking in non-populated areas to ensure distance from others.

5.5 NUTRITION

- A healthy diet benefits mental and physical health. [42, 43]
- Maintaining a high-quality healthy diet can be challenging, particularly when people may be avoiding grocery stores, cannot buy particular items, experience quantity limits on foods, be spending more time at home, or relying on take away/home delivery for fast food meals.
- Advice from the World Health Organisation is to consume fresh and unprocessed food, drink 8-10 cups of water each day, eat moderate amounts of fat and oil, and eat less salt and sugar.[44]
- Monitor alcohol consumption. It is often easy to drink in times of stress, however this may lead to problem patterns of drinking, as well as increased caloric intake.[45]

5.6 CLINICAL WELLNESS

- Self-care for health care professionals is highly important during stressful times. This includes being respectful and kind to yourself, practicing switching on and off, re-charging with things you enjoy, and getting good quality sleep. For tips for frontline staff on self-care, please see https://mindspot.org.au/assets/pdf/11_Psychological_Tips_for_Frontline_Staff.pdf
- Access formal mental health support through Employee Assistance Programs or external services. See the Resources Supplement for a range of available services.



5.7 RESOURCES: MENTAL HEALTH SUPPORT RESOURCES IN AUSTRALIA

ONLINE GATEWAY TO AUSTRALIAN MENTAL HEALTH AND WELLBEING RESOURCES

- <https://headtohealth.gov.au/>

CRISIS, COUNSELLING AND INFORMATION SERVICES

- Lifeline 13 11 14. Crisis counselling 24 hours a day, 7 days a week. Lifeline text 0477 13 11 14, 6pm – midnight (AEDT), 7 nights a week. Lifeline webchat <https://www.lifeline.org.au/>, 7pm – midnight (AEDT), 7 nights a week.
- Kids Helpline 1800 55 1800 or webchat <https://kidshelpline.com.au>. Support for children 24 hours a day, 7 days a week.
- Beyond Blue 1300 22 4636 or <https://beyondblue.org.au>; or their COVID-19 specific number 1800 512 348, which provides counselling 24 hours a day, 7 days a week.
- MensLine Australia 1300 789 978 or <https://mensline.org.au/>. Counselling and resources for men in crisis 24 hours a day, 7 days a week.
- 1800 Respect 1800 737 732 <https://www.1800respect.org.au/>. National sexual assault, domestic and family violence counselling service 24 hours a day, 7 days a week.
- Parentline (telephone number and office hours differ per state, see <https://kidshelpline.com.au/parents/issues/how-parentline-can-help-you>). Counselling and support for parents, grandparents, guardians or carers of children.
- Carers Australia 1800 422 737 or <https://www.carersaustralia.com.au/about-us/>. Counselling and support for carers.
- Headspace 1800 650 890 <https://headspace.org.au/>. Support for young people aged 12-25 and their families.
- Suicide Call Back Service 1300 659 467, online chat and video chat <https://www.suicidcallbackservice.org.au/>. Crisis counselling for people affected by suicide 24 hours a day, 7 days a week.
- National Alcohol and Other Drug hotline 1800 250 015.
- QLife 1800 184 527 and webchat <https://www qlife.org.au/>. LGBTI peer support and referral.
- Multicultural mental health <https://embracementalhealth.org.au/>. Multilingual information regarding mental health.

FREE ONLINE TREATMENT PROGRAMS FOR AUSTRALIANS

- Mind Spot <https://mindspot.org.au/>
- Moodgym <https://moodgym.com.au/>
- This Way Up <https://thiswayup.org.au/> (free during the COVID-19 pandemic)

TOOLS AND APPS FOR WELLBEING

- Reach Out has reviewed mobile apps and tools related to health and wellbeing, including apps for stress and mood management, resilience, meditation, physical activity, and use of alcohol and other drugs. Find more information here: <https://au.reachout.com/tools-and-apps>

PATIENT EXPERIENCES OF SEVERE ASTHMA

- This module on the Healthtalk Australia website provides information and support resources for people with severe asthma, their health professionals and carers: <https://healthtalkaustralia.org/severe-asthma/overview/>

6. USEFUL REFERENCES AND RESOURCES

The latest data for Australia can be accessed from regular surveillance reports:

- COVID-19 National Incident Room Surveillance Team. COVID-19, Australia: Website <http://www.health.gov.au/cdi>
- The latest surveillance reports from the Australian Government via the Department of Health. This site is updated daily with the latest numbers of COVID-19 in Australia. Website <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov-health-alert/coronavirus-covid-19-current-situation-and-case-numbers>
- The latest management advice from the National COVID-19 Clinical Evidence Taskforce is available as 'living guidelines' from: Website <https://www.covid19evidence.net.au>

Agency for Clinical Innovation. Aerosol generating respiratory therapies: Respiratory physiotherapy: NSW Government, 2020. <https://aci.health.nsw.gov.au/resources/respiratory/covid-19/information-about-aerosol-generating-respiratory-therapies-covid-19>

Agency for Clinical Innovation. Lung function testing. COVID-19 advice. NSW Government, 2020. <https://www.aci.health.nsw.gov.au/resources/respiratory> https://aci.health.nsw.gov.au/_data/assets/pdf_file/0010/582940/ACI-Respiratory-COP-Aerosol-lung-function-testing_V4.pdf

Australian Asthma Handbook Clinical Issues: COVID-19: National Asthma Council, 2020. <https://www.asthmahandbook.org.au/clinical-issues/covid-19>

British Thoracic Society. Advice for Healthcare Professionals Treating People with Asthma (adults) in relation to COVID-19. Version 4.0 7/4/20. 2020. <https://www.brit-thoracic.org.uk/about-us/covid-19-information-for-the-respiratory-community/>

Bhatraju PK, Ghassemieh BJ, Nichols M, Kim R, Jerome KR, Nalla AK, Greninger AL, Pipavath S, Wurfel MM, Evans L, Kritek PA, West TE, Luks A, Gerbino A, Dale CR, Goldman JD, O'Mahony S, Mikacenic C. Covid-19 in Critically Ill Patients in the Seattle Region — Case Series. *New England Journal of Medicine* 2020 doi: 10.1056/NEJMoa2004500. This study includes the characterisation of three patients with asthma and COVID-19.

Fu L, Wang B, Yuan T, Chen X, Ao Y, Fitzpatrick T, Li P, Zhou Y, Lin Y, Duan Q, Luo G, Fan S, Lu Y, Feng A, Zhan Y, Liang B, Cai W, Zhang L, Du X, Shu Y, Li L, Zou H. Clinical characteristics of coronavirus disease 2019 (COVID-19) in China: a systematic review and meta-analysis. *J Infect*. 2020 Apr 10. pii: S0163-4453(20)30170-5. doi: 10.1016/j.jinf.2020.03.041. [Epub ahead of print] PubMed PMID: 32283155. This systematic review of 43 studies involving 3600 patients reports the clinical and laboratory characteristics of COVID-19 disease.

Garg S, Kim L, Whitaker M, O'Halloran A, Cummings C, Holstein R, Prill M, Chai SJ, Kirley PD, Alden NB, Kawasaki B, Yousey-Hindes K, Niccolai L, Anderson EJ, Openo KP, Weigel A, Monroe ML, Ryan P, Henderson J, Kim S, Como-Sabetti K, Lynfield R, Sosin D, Torres S, Muse A, Bennett NM, Billing L, Sutton M, West N, Schaffner W, Talbot HK, Aquino C, George A, Budd A, Brammer L, Langley G, Hall AJ, Fry A. Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 - COVID-NET, 14 States, March 1-30, 2020. *MMWR Morbidity and mortality weekly report* 2020;69(15):458-64. doi: 10.15585/mmwr.mm6915e3 [published Online First: 2020/04/17]. A US study reporting that 17% of people hospitalised with Covid19 had asthma (greater than expected based on community prevalence), however only 6.7% reported wheeze, suggesting a clinical picture of pneumonitis rather than asthma exacerbation.

Gibson PG, Qin L, Puah HS. COVID-19 ARDS. *Med J Aust* 2020; 213 (2): 54-56.e1. | | doi: 10.5694/mja2.50674 Review of COVID-19 ARDS and its relation to 'typical ARDS', using the latest literature and personal experience from Singapore and Wuhan, China.

Grasselli G, Zangrillo A, Zanella A, Antonelli M, Cabrini L, Castelli A, Cereda D, Coluccello A, Foti G, Fumagalli R, Iotti G, Latronico N, Lorini L, Merler S, Natalini G, Piatti A, Ranieri MV, Scandroglio AM, Storti E, Cecconi M, Pesenti A, Network ftC-LI. Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy. *JAMA* 2020;323(16):1574-81. doi: 10.1001/jama.2020.5394. This study characterizes 1591 patients with coronavirus disease 2019 (COVID-19) requiring treatment in an intensive care unit (ICU) in the Lombardy region of Italy.

Halpin DMG, Faner R, Sibila O, Badia JR, Agusti A. Do chronic respiratory diseases or their treatment affect the risk of SARS-CoV-2 infection? *Lancet Respir Med*. 2020 Apr 3. pii: S2213-2600(20)30167-3. doi:10.1016/S2213-2600(20)30167-3. [Epub ahead of print] PubMed PMID: 32251625. This article reviews the prevalence of asthma and COPD in COVID-19 and SARS, and identifies that both asthma and COPD are under-represented in these infections.

Li X, Xu S, Yu M, Wang K, Tao Y, Zhou Y, Shi J, Zhou M, Wu B, Yang Z, Zhang C, Yue J, Zhang Z, Renz H, Liu X, Xie J, Xie M, Zhao J. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. *Journal of Allergy and*

Clinical Immunology 2020 doi: <https://doi.org/10.1016/j.jaci.2020.04.006> Only 5 of 548 adult inpatients had asthma. Less than expected from community prevalence.

Setti L, Passarini F, De Gennaro G, Barbieri P, Perrone MG, Borelli M, Palmisani J, Di Gilio A, Piscitelli P, Miani A. Airborne Transmission Route of COVID-19: Why 2 Meters/6 Feet of Inter-Personal Distance Could Not Be Enough. *International Journal of Environmental Research and Public Health* 2020;17(8):2932. This study discussed the potential airborne spread of the SARS-COV2 virus.

Spinato G, Fabbris C, Polesel J, Cazzador D, Borsetto D, Hopkins C, Boscolo-Rizzo P. Alterations in Smell or Taste in Mildly Symptomatic Outpatients With SARS-CoV-2 Infection. *JAMA* 2020 doi: 10.1001/jama.2020.6771. This study evaluated prevalence, intensity, and timing of an altered sense of smell or taste in patients with SARS-CoV-2 infections.

The World Health Organization. Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected: Interim Guidance. 13 March 2020, 2020. <https://www.who.int/docs/default-source/coronaviruse/clinical-management-of-novel-cov.pdf>

Zhang JJ, Dong X, Cao YY, Yuan YD, Yang YB, Yan YQ, Akdis CA, Gao YD. Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China. *Allergy*. 2020 Feb 19. doi: 10.1111/all.14238. [Epub ahead of print] PubMed PMID: 32077115. This study reports clinical features of COVID-19 and specifically investigates measures relevant to asthma, namely asthma as a risk factor, and impact of COVID-19 on blood eosinophils.

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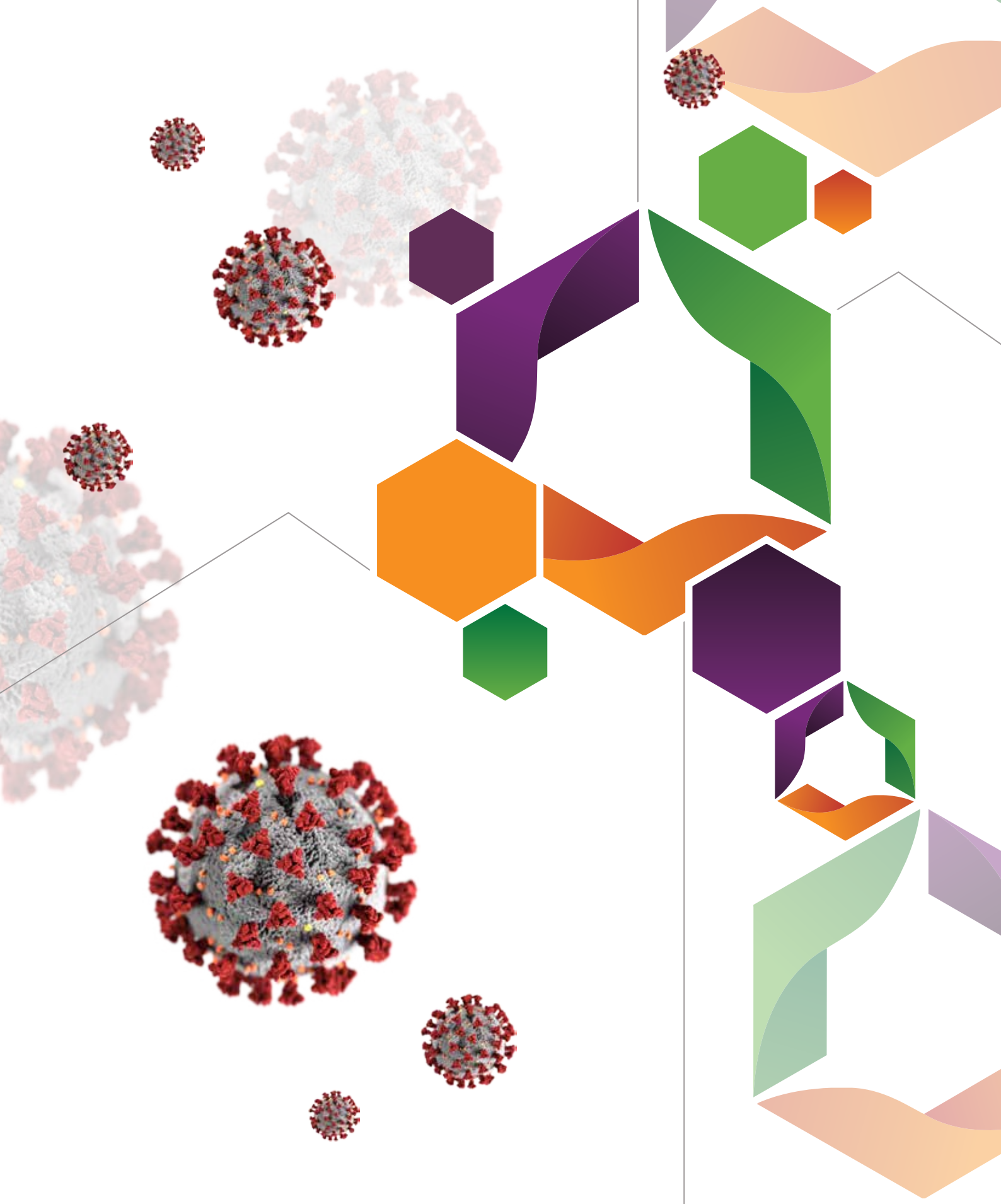
Professor Greg King

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REFERENCES

1. Zhu, N., et al., *A Novel Coronavirus from Patients with Pneumonia in China, 2019*. New England Journal of Medicine, 2020. **382**(8): p. 727-733.
2. Caly, L., et al., *Isolation and rapid sharing of the 2019 novel coronavirus (SARS-CoV-2) from the first patient diagnosed with COVID-19 in Australia*. Med J Aust, 2020.
3. Yan, R., et al., *Structural basis for the recognition of SARS-CoV-2 by full-length human ACE2*. Science, 2020. **367**(6485): p. 1444-1448.
4. Setti, L., et al., *Airborne Transmission Route of COVID-19: Why 2 Meters/6 Feet of Inter-Personal Distance Could Not Be Enough*. International Journal of Environmental Research and Public Health, 2020. **17**(8): p. 2932.
5. van Doremalen, N., et al., *Aerosol and Surface Stability of SARS-CoV-2 as Compared with SARS-CoV-1*. New England Journal of Medicine, 2020. **382**(16): p. 1564-1567.
6. Kampf, G., et al., *Persistence of coronaviruses on inanimate surfaces and their inactivation with biocidal agents*. J Hosp Infect, 2020. **104**(3): p. 246-251.
7. Fu, L., et al., *Clinical characteristics of coronavirus disease 2019 (COVID-19) in China: A systematic review and meta-analysis*. Journal of Infection, 2020.
8. Li, X., et al., *Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan*. Journal of Allergy and Clinical Immunology, 2020.
9. Spinato, G., et al., *Alterations in Smell or Taste in Mildly Symptomatic Outpatients With SARS-CoV-2 Infection*. JAMA, 2020.
10. Sutton, D., et al., *Universal Screening for SARS-CoV-2 in Women Admitted for Delivery*. New England Journal of Medicine, 2020.
11. Kimball, A., et al., *Asymptomatic and Presymptomatic SARS-CoV-2 Infections in Residents of a Long-Term Care Skilled Nursing Facility — King County, Washington, March 2020, in Morbidity and Mortality Weekly Report*. 2020, Centre for Disease Control and Prevention.
12. Zhang, J.J., et al., *Clinical characteristics of 140 patients infected with SARS-CoV-2 in Wuhan, China*. Allergy, 2020.
13. Rodriguez-Morales, A.J., et al., *Clinical, laboratory and imaging features of COVID-19: A systematic review and meta-analysis*. Travel Med Infect Dis, 2020: p. 101623.
14. Grasselli, G., et al., *Baseline Characteristics and Outcomes of 1591 Patients Infected With SARS-CoV-2 Admitted to ICUs of the Lombardy Region, Italy*. JAMA, 2020. **323**(16): p. 1574-1581.
15. Halpin, D.M.G., et al., *Do chronic respiratory diseases or their treatment affect the risk of SARS-CoV-2 infection?* The Lancet Respiratory Medicine.
16. Gibson, P.G., L. Qin, and H. Puah, *Review of COVID-19 ARDS and its relation to 'typical ARDS', using the latest literature and personal experience from Singapore and Wuhan, China*. 2020.
17. Garg, S., et al., *Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 - COVID-NET, 14 States, March 1-30, 2020*. MMWR Morb Mortal Wkly Rep, 2020. **69**(15): p. 458-464.
18. The World Health Organization, *Clinical management of severe acute respiratory infection (SARI) when COVID-19 disease is suspected: Interim Guidance*. 2020.
19. Robinson, L.B., et al., *COVID-19 severity in hospitalized patients with asthma: A matched cohort study*. J Allergy Clin Immunol Pract, 2021. **9**(1): p. 497-500.
20. Williamson, E., et al., *OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients*. medRxiv, 2020: p. 2020.05.06.20092999.
21. Smith, S.J., et al., *The impact of the first COVID-19 surge on Severe Asthma Patients in the UK. Which is worse: The virus or the lockdown?* ERJ Open Research, 2020: p. 00768-2020.
22. Hanon, S., et al., *COVID-19 and biologics in severe asthma: data from the Belgian Severe Asthma Registry*. European Respiratory Journal, 2020. **56**(6): p. 2002857.
23. Thoracic Society of Australia and New Zealand and Australian and New Zealand Society of Respiratory Science Ltd, *Peak Respiratory Bodies recommend suspension of lung function testing*. 2020.
24. Australian Asthma Handbook *Clinical Issues: COVID-19*. 2020, National Asthma Council.
25. Agency for Clinical Innovation, *Aerosol generating respiratory therapies: Respiratory physiotherapy*. 2020, NSW Government.
26. British Thoracic Society, *Advice for Healthcare Professionals Treating People with Asthma (adults) in relation to COVID-19*. 2020.
27. Ramakrishnan, S., et al., *Inhaled budesonide in the treatment of early COVID-19 illness: a randomised controlled trial*. medRxiv, 2021: p. 2021.02.04.21251134.
28. The World Health Organization, *Corticosteroids for COVID-19, in Living Guidance*. 2020.
29. Wu, C., et al., *Risk Factors Associated With Acute Respiratory Distress Syndrome and Death in Patients With Coronavirus Disease 2019 Pneumonia in Wuhan, China*. JAMA Internal Medicine, 2020.
30. Bhatraju, P.K., et al., *Covid-19 in Critically Ill Patients in the Seattle Region — Case Series*. New England Journal of Medicine, 2020.
31. McDonald, V.M., et al., *Treatable traits can be identified in a severe asthma registry and predict future exacerbations*. Respirology, 2019. **24**(1): p. 37-47.
32. Luyster, F.S., et al., *Association between insomnia and asthma burden in the Severe Asthma Research Program (SARP) III*. Chest, 2016. **150**(6): p. 1242-1250.
33. Dickerson, D., *Seven tips to manage your mental health and well-being during the COVID-19 outbreak*. Nature, 2020.
34. Lifeline Australia. *Mental health and wellbeing during the Coronavirus COVID-19 outbreak*. 2020 [cited 2020 9 April]; Available from: <https://www.lifeline.org.au/get-help/topics/mental-health-and-wellbeing-during-the-coronavirus-covid-19-outbreak>.
35. Beyond Blue Australia. *Ways to look after your mental health amid the coronavirus pandemic*. 2020 [cited 2020 April 9]; Available from: <https://coronavirus.beyondblue.org.au/managing-my-daily-life/coping-with-isolation-and-being-at-home/ways-to-look-after-your-mental-health.html>.
36. Lau, A.L.D., et al., *The SARS (Severe Acute Respiratory Syndrome) pandemic in Hong Kong: Effects on the subjective wellbeing of elderly and younger people*. Aging & Mental Health, 2008. **12**(6): p. 746-760.
37. Warburton, D.E.R., C.W. Nicol, and S.S.D. Bredin, *Health benefits of physical activity: The evidence*. Canadian Medical Association Journal, 2006. **174**(6): p. 801-809.
38. Penedo, F.J. and J.R. Dahn, *Exercise and well-being: A review of mental and physical health benefits associated with physical activity*. Current Opinion in Psychiatry, 2005. **18**(2): p. 189-193.
39. Eriksen, W. and D. Bruusgaard, *Do physical leisure time activities prevent fatigue? A 15 month prospective study of nurses' aides*. British Journal of Sports Medicine, 2004. **38**(3): p. 331.
40. Australian Government Department of Health. *Australia's Physical Activity and Sedentary Behaviour Guidelines and the Australian 24-Hour Movement Guidelines*. 2019 [cited 2020 April 9]; Available from: <https://www1.health.gov.au/internet/main/publishing.nsf/Content/health-pubhlth-strateg-phys-act-guidelines#npa1864>.
41. Cordova-Rivera, L., et al., *Physical Activity and Exercise Capacity in Severe Asthma: Key Clinical Associations*. J Allergy Clin Immunol Pract, 2018. **6**(3): p. 814-822.
42. Lai, J.S., et al., *A systematic review and meta-analysis of dietary patterns and depression in community-dwelling adults*. American Journal of Clinical Nutrition, 2014. **99**(1): p. 181-97.
43. Afshin, A., et al., *Health effects of dietary risks in 195 countries, 1990-2017: A systematic analysis for the Global Burden of Disease Study 2017*. The Lancet, 2019. **393**(10184): p. 1958-1972.
44. World Health Organization. *Nutrition advice for adults during the COVID-19 outbreak*. 2020 [cited 2020 April 9]; Available from: <http://www.emro.who.int/nutrition/nutrition-infocus/nutrition-advice-for-adults-during-the-covid-19-outbreak.html>.
45. Keyes, K.M., M.L. Hatzenbuehler, and D.S. Hasin, *Stressful life experiences, alcohol consumption, and alcohol use disorders: The epidemiologic evidence for four main types of stressors*. Psychopharmacology, 2011. **218**(1): p. 1-17.



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