

## COVID Pharmacotherapy FAQs: Addressing Patient Questions

There is a lot of misinformation regarding COVID-19 on the internet. The chart below provides information to help answer questions and correct misconceptions about pharmacotherapy as it relates to COVID-19. Dietary supplements that patients often want to try for COVID-19 are also addressed. Another source of information to help dispel false beliefs related to COVID-19 is the World Health Organization's "*Coronavirus Disease (COVID-19) Advice for the Public: Mythbusters*," at <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public/mythbusters>. See our chart, *Treatments of Interest for COVID-19*, for information and resources on drugs, convalescent plasma, and dietary supplements being investigated for COVID-19.

Clinical question	Pertinent information or resource
Do ACE inhibitors or ARBs make COVID-19 worse?	<ul style="list-style-type: none"> <li>• The SARS-CoV-2 virus uses ACE2 to enter cells.<sup>1</sup> ACE inhibitors and ARBs may upregulate ACE2.<sup>1</sup> In theory, these drugs could thereby facilitate virus entry into cells.<sup>1</sup> But on the other hand, blocking angiotensin could reduce lung injury.<sup>1</sup></li> <li>• No evidence suggests that patients taking an ACEI or ARB are more susceptible to COVID-19 infection, or that these medications worsen outcomes.<sup>2-5</sup> One cohort study even suggests reduced mortality in COVID-19 patients taking them for other indications.<sup>3</sup> Furthermore, we know that these drugs benefit patients with diabetic nephropathy and cardiovascular disease, populations at risk of severe COVID-19 disease.<sup>1,6</sup></li> <li>• Patients should continue these medications. See statements from:               <ul style="list-style-type: none"> <li>• the <b>American Heart Association</b>, the <b>Heart Failure Society of America</b>, and the <b>American College of Cardiology</b> at <a href="https://newsroom.heart.org/news/patients-taking-ace-i-and-arbs-who-contract-covid-19-should-continue-treatment-unless-otherwise-advised-by-their-physician">https://newsroom.heart.org/news/patients-taking-ace-i-and-arbs-who-contract-covid-19-should-continue-treatment-unless-otherwise-advised-by-their-physician</a>.</li> <li>• the <b>Canadian Cardiovascular Society</b> at <a href="https://www.ccs.ca/images/Images_2020/CCS_CHFS_Update_COVID__CV_medications_Mar20.pdf">https://www.ccs.ca/images/Images_2020/CCS_CHFS_Update_COVID__CV_medications_Mar20.pdf</a>.</li> <li>• the <b>European Society of Cardiology</b> at <a href="https://www.escardio.org/Councils/Council-on-Hypertension-(CHT)/News/position-statement-of-the-esc-council-on-hypertension-on-ace-inhibitors-and-ang">https://www.escardio.org/Councils/Council-on-Hypertension-(CHT)/News/position-statement-of-the-esc-council-on-hypertension-on-ace-inhibitors-and-ang</a>.</li> </ul> </li> </ul>
Can NSAIDs be used in COVID-19-infected patients?	<ul style="list-style-type: none"> <li>• Anecdotal reports regarding worse COVID-19 outcomes in patients taking NSAIDs have spread in the media and on social media, including via a tweet from a French health official.<sup>2,7</sup> In 2019, a French report suggested that NSAIDs could worsen infections, mainly Strep, perhaps by masking symptoms.<sup>8,9</sup> However, there is currently no reliable clinical data supporting worse outcomes in patients taking NSAIDs or aspirin.<sup>2,10</sup> Preclinical data is mixed on the potential effects of NSAIDs on COVID-19 (increased expression of ACE2, which the virus uses to enter cells, vs potential antiviral activity of NSAIDs).<sup>2</sup></li> <li>• Patients taking low-dose aspirin should not stop taking it because of COVID-19 concerns.<sup>2</sup></li> <li>• Neither the FDA nor Health Canada is advising changes to NSAID use due to COVID-19.<sup>10,11</sup></li> </ul>

Clinical question	Pertinent information or resource
Are any supplements effective for prevention or treatment of COVID-19?	<ul style="list-style-type: none"><li>• Patients are using supplements as immune boosters (e.g., echinacea, colloidal silver, green tea, selenium, vitamin C, vitamin D) or for their purported antiviral activity (e.g., elderberry, garlic, oleander, quercetin, zinc). However, <b>there is no scientific evidence that any alternative remedies can prevent or treat COVID-19, and some products may not be safe.</b><sup>12</sup></li><li>• The following are unsafe plants or supplements that patients should be advised to avoid.<ul style="list-style-type: none"><li>• <b>Oleander</b> has led to fatal poisonings. All parts of the plant contain cardiac glycosides. Other components have central nervous system depressant effects or strychnine-like actions.<sup>13</sup></li><li>• <b>Colloidal silver</b> accumulates in the body and can cause permanent skin discoloration, neurologic toxicity (e.g., seizures), and liver or kidney damage.<sup>16</sup></li><li>• <b>Intranasal zinc</b> can cause permanent loss of smell.<sup>20</sup></li></ul></li><li>• <b>Ashwagandha</b> (an “adaptogen”) should be avoided in pregnancy, as it may cause miscarriage. It is possibly safe for nonpregnant adults at doses up to 1,000 mg/day for up to 12 weeks. It may cause GI side effects and dermatitis, and rarely, hepatotoxicity. It may stimulate thyroid hormone production or secretion, suppressing TSH and increasing T3 or T4.<sup>22</sup></li><li>• Advise limiting <b>green tea</b> (beverage) to eight cups daily, due to caffeine content.<sup>23</sup> Green tea oral <b>extract</b> is possibly safe when used as directed.<sup>23</sup> However, there are reports of hepatotoxicity with green tea extracts.<sup>23</sup> Advise taking this form with food to limit this risk.<sup>23</sup> It should be avoided in patients with liver impairment.<sup>23</sup></li><li>• <b>Elderberry extract</b> is possibly safe. People allergic to grass pollen might experience rhinitis or dyspnea. Raw or unripe fruit, or plant parts other than the fruit, should not be consumed; they contain cyanogenic glycosides that can cause GI side effects.<sup>26</sup> Proper cooking eliminates the toxin, but teas and hot drinks have also caused GI effects.<sup>26</sup> Neurologic side effects have also been reported.<sup>26</sup></li><li>• <b>Quercetin</b> is generally well-tolerated, but headache and paresthesia have been reported.<sup>27</sup></li><li>• Products of interest that are likely safe when taken orally and as directed include <b>echinacea, garlic</b> (note antiplatelet effect), and <b>American ginseng.</b><sup>17-19</sup> <b>Panax ginseng</b> (red ginseng) is likely safe when used for up to six months. Hormonal effects are of concern with longer use.<sup>24</sup> <b>Resveratrol</b> is likely safe when consumed in foods, but high doses of supplements may cause GI side effects.<sup>25</sup></li><li>• Advise patients self-medicating with <b>selenium, vitamin E</b>, or other vitamins or minerals to stick with doses approximating recommended intakes to minimize risks.<sup>21</sup></li><li>• Several studies are looking at multivitamin/mineral combos as adjuncts for treatment or prevention. See <a href="http://www.clinicaltrials.gov">www.clinicaltrials.gov</a> for more information. For information on <b>zinc, vitamin C</b>, and <b>vitamin D</b>, see our chart, <i>Treatments of Interest for COVID-19</i>.</li><li>• <b>See our Natural Medicines database (www.naturaldatabase.com)</b> for information on efficacy and safety (including drug interactions) of specific alternative medicines.</li></ul>

Clinical question	Pertinent information or resource
Are heartburn drugs effective for treating or preventing COVID-19?	For information on famotidine, see our chart, <i>Treatments of Interest for COVID-19</i> . <ul style="list-style-type: none"><li>• Proton pump inhibitor (PPI) use was associated with a higher risk of COVID-19 based on results of an online survey of ~53,000 English-speaking Americans, after controlling for confounders. Risk was higher for patients taking a PPI twice daily vs once daily. H2 blockers did not appear to increase risk. Any increased absolute risk of COVID-19 in PPI users is probably small. If patients ask about PPI use, consider this an opportunity to reevaluate treatment and reinforce COVID-19 preventive measures.<sup>14</sup></li></ul>
Does nicotine protect against COVID-19?	<ul style="list-style-type: none"><li>• In China, there was an unexpectedly low prevalence of smoking among patients hospitalized with COVID-19. Low smoking prevalence among hospitalized COVID-19 patients has also been seen in the U.S.<sup>15</sup></li><li>• Nicotine, through its cholinergic agonist activity, blocks production of inflammatory cytokines such as IL-6.<sup>15</sup></li><li>• There is interest in using nicotine, either as currently available products, or perhaps via nebulization, as an adjunct for COVID-19 treatment.<sup>15</sup></li><li>• Continue to use nicotine replacement products for nicotine users who are hospitalized for COVID-19, and for anyone who desires to quit smoking.<sup>15</sup></li></ul>

**Abbreviations:** GI = gastrointestinal; TSH = thyroid stimulating hormone; T3 = triiodothyronine; T4 = thyroxine

*Users of this resource are cautioned to use their own professional judgment and consult any other necessary or appropriate sources prior to making clinical judgments based on the content of this document. Our editors have researched the information with input from experts, government agencies, and national organizations. Information and internet links in this article were current as of the date of publication.*

Prepared by the Editors of Therapeutic Research Center (361003).

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***Cite this document as follows: Clinical Resource, COVID-19 Pharmacotherapy FAQs: Addressing Patient Questions. Pharmacist's Letter/Prescriber's Letter. October 2020.***

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