

Evidence-Based Medicine in the COVID-19 Era

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Evidence-based medicine (EBM) is created at the intersection of the best available clinical evidence, clinician expertise, and patient values.¹ During the COVID-19 pandemic, we have been short on high-quality evidence because of a lack of clinical trials and a sparsity of clinician expertise, given limited experience with the unknown entity of COVID-19. Absence of an evidence foundation, coupled with a rapidly changing evidence base, has created great uncertainty, sometimes leading to emotion-based, rather than evidence-based, decision-making.

At the start of the COVID-19 pandemic, clinical decisions relied on indirect evidence (e.g., from animal studies or the H1N1 experience a decade ago) and the few available case reports/series from China, where COVID-19 first emerged. The evidence base subsequently expanded to include observational studies from the next “hot spots”, Seattle (Washington) and Italy. Later still, evidence overload arose, as the floodgates opened with the appearance of an enormous volume of observational studies, including many in non-peer-reviewed “preprint servers” (e.g., www.medRxiv.org). Finally, some randomized controlled trials were completed worldwide at breakneck speed. Although this evidence progression may be an uncomfortable experience for clinicians and the general public alike, it is precisely how EBM works, with an actively evolving evidence base, subsequently higher-quality evidence, and greater certainty over time.

This acceleration of evidence generation has challenged our ability to keep up and has magnified the cracks in our current methods of evidence synthesis. If COVID-19 has taught us anything, it is the importance of evidence and EBM skills in our clinical decision-making. With new evidence emerging daily, COVID-19 has highlighted the value of lifelong learning, of not remaining stagnant in our knowledge. Never before has it been more obvious that we need to stay abreast of new evidence and appraise it objectively to be able to make optimal, evidence-informed, individualized decisions with patients. The high uncertainty of the evidence has also underscored the importance of incorporating patient values and preferences in balancing the potential risks and benefits of therapies, albeit in an

environment of amplified tensions between societal and individual values.

The tidal wave of COVID-19 evidence has accelerated the pressure for innovation and creativity in EBM. In areas where we might always have wanted further development, COVID-19 has mandated change. While the pandemic has generated public interest in science, rapidly evolving evidence has also created public confusion due to inconsistent messaging. Despite long-standing calls to advance how evidence is synthesized for “evidence consumers”, it has become clear that we need a coordinated system to organize rapidly developing and massive evidence bases. Rapid systematic review methods have been further refined, including publicly available initiatives, and “living” systematic reviews and recommendation maps (<https://covid19.evidenceprime.ca/>), which are updated as new evidence is released, have multiplied.²⁻⁵ Collaborations among clinical trialists to conduct prospective meta-analyses of ongoing clinical trials, synthesizing evidence as it is being created, has been another innovation in evidence synthesis.⁶ Finally, artificial intelligence initiatives have attempted to identify and synthesize the evolving evidence.⁷ While these new initiatives are motivated by the urgency of understanding COVID-19 evidence, it is hoped that they may also provide an impetus to create higher standards in how all evidence, related to COVID-19 or otherwise, is synthesized and made available to clinicians, including enhanced leadership in evidence stewardship. In this time of uncertainty during the COVID-19 pandemic, the foundation of EBM principles and their revitalized evolution are more important than ever.

References

1. Djulbegovic B, Guyatt GH. Progress in evidence-based medicine: a quarter century on. *Lancet*. 2017;390(10092):415-23.
2. *Oxford COVID-19 evidence service*. Centre for Evidence-Based Medicine; [cited 2020 Mar 20]. Available from: <https://www.cebm.net/oxford-covid-19-evidence-service/>
3. *Meta-evidence – COVID-19: live meta-analysis and evidence synthesis of therapies for COVID19*. Centre Hospitalier Universitaire de Lyon, Hospices Civils de Lyon, Service de Pharmacologie et de Toxicologie; [cited 2020 Jun 7]. Available from: <http://www.metaevidence.org/COVID19.aspx>

4. *COVID-NMA: COVID-19 open living evidence synthesis to inform decision*. Cochrane Collaboration and World Health Organization; [cited 2020 Nov 1]. Available from: <https://covid-nma.com/>
5. Siemieniuk RAC, Bartoszko JJ, Ge L, Zeraatkar D, Izcovich A, Kum E, et al. Drug treatments for covid-19: living systematic review and meta-analysis. *BMJ*. 2020;370:m2980.
6. WHO Rapid Evidence Appraisal for COVID-19 Therapies (REACT) Working Group. Association between administration of systemic corticosteroids and mortality among critically ill patients with COVID-19: a meta-analysis. *JAMA*. 2020;324(13):1330-41.
7. Brainard J. Scientists are drowning in COVID-19 papers. Can new tools keep them afloat? *Science*. 2020;doi:10.1126/science.abc7839.



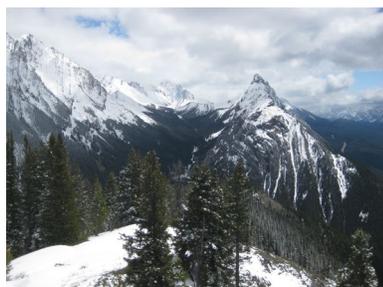
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Competing interests: None declared.

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ON THE FRONT COVER



Mount Wintour, Kananaskis Country, Alberta

This photograph showcases the snowy pinnacle of Mount Wintour in Kananaskis Country, Alberta. June Chen took this photo with a Canon PowerShot SD1100 IS digital camera while she was hiking the King Creek Ridge in May 2019. June is a clinical pharmacist with the University of Alberta Hospital in Edmonton. She practises on the cardiac intensive care and cardiovascular surgery units. During the summer months, she enjoys hiking in the mountains, and all year round, she likes to dance contemporary jazz.

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