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activity and interstitial lung disease subtype could also be provided in a large prospective study designed to address these issues in a vaccinated rheumatoid arthritis population with detailed therapeutic documentation.

I declare no competing interests.

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## Preventive medicine in rheumatology: COVID-19 and its lessons for better health outcomes



The COVID-19 pandemic not only persists but represents a substantive ongoing threat to patients on immunosuppressive therapies. Advances in antiviral therapies and vaccines have led to substantially reduced risk, of both infection and adverse outcomes, for people who can access them,<sup>1</sup> but the risk is ongoing as new variants emerge. In this continuing battle, some approaches, such as glucocorticoids, will persist in their original form and some will become irrelevant, such as older neutralising monoclonal antibodies.<sup>2</sup> Many strategies, such as vaccines and antivirals, will sit between these two extremes, in need of constant revision of strategy to deliver protection. In this race to deliver new solutions relevant to current threats, patients who are immunosuppressed need us to not only continually assess effective strategies for them, but also think carefully about their application in practice.

In *The Lancet Rheumatology*, Malcolm Risk and colleagues<sup>3</sup> report the findings of their study of COVID-19 vaccine effectiveness in patients on immunosuppressants during the omicron (B.1.1.529 variant)-dominant wave of the pandemic. Among 168 414 patients from the US state of Michigan during the first omicron peak (December, 2021, to March, 2022), the 5609 patients who were taking immunosuppressive mediations had increased risk of adverse outcomes compared with

those who were not immunosuppressed. Patients taking immunosuppressive disease-modifying antirheumatic drugs (hazard ratio 2.32, 95% CI 1.23–4.38;  $p=0.0097$ ) and those taking glucocorticoids (2.93, 1.77–4.86;  $p<0.0001$ ) were at increased risk of hospitalisation due to COVID-19 compared with those who were not immunosuppressed, a finding that is consistent with both initial studies and two more recent large studies.<sup>4–6</sup>

Poorer outcomes have been observed consistently in multiple, rigorous, large datasets of varied origin and context, suggesting that COVID-19 remains a risk that disproportionately impacts patients who are immunosuppressed. Importantly, though, the study by Risk and colleagues<sup>3</sup> shows that, even in the era of the omicron variant, preventive therapy still mitigates this risk: patients who received three doses of either available mRNA vaccine derived significant benefit over those who received two doses (50% [95% CI 31 to 64] vaccine effectiveness against SARS-CoV-2 infection for three doses of the BNT162b2 vaccine;  $p<0.0001$ ; vs 13% [–19 to 39] for two doses;  $p=0.43$ ; compared with those who were unvaccinated). However, protection against hospitalisation due to COVID-19 was similar between patients who received three doses and those who received two doses (87% [95% CI 74 to 93] vaccine effectiveness with three doses of either mRNA vaccine



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vs 85% [62 to 94] with two doses; both  $p < 0.0001$ ; compared with patients who were unvaccinated). Although many studies have suggested that two vaccine doses are sufficient, it has been the ongoing implementation of further preventive measures, including additional vaccine doses, that has made a difference for patients who are immunosuppressed. To prepare for the future, what should we learn from this?

At this stage of the COVID-19 pandemic, we have developed many useful preventive strategies to reduce the risk of poor outcomes among patients who are immunosuppressed.<sup>7</sup> Key in our current armamentarium are vaccines, masking and other infection prevention measures, pre-exposure prophylaxis, and antivirals. Until the delivery of potentially perennial solutions like host-targeted antivirals,<sup>7</sup> the optimal preventive strategy will change with improved understanding, but also with the moving target of new variants. New variants will continue to emerge, and a failure to match their speed will leave patients vulnerable. As the global interest in COVID-19 wanes, we must focus on protecting patients and move from slow, progressive uptake of preventive medicine to more rapid action.

However, our track record on such comprehensive, rapid action with preventive medicine is poor. Before COVID-19, there had been persistently low uptake of vaccination against influenza and herpes zoster in patients who are immunosuppressed, despite their significantly increased risk of infection and adverse outcomes due to many immunosuppressive therapies, as well as underlying rheumatic diseases. Rates of cardiovascular and malignancy screening have been poor despite effective programmes in the broader community.<sup>8</sup> Even in response to COVID-19, with the high-profile urgency of a pandemic, we must acknowledge that we could have done better. Our capacity to educate patients about the importance of vaccines has not been comprehensive. Uptake of pre-exposure prophylaxis, even when available, has been slower than we would have liked, although access has been an issue in some areas. Perhaps, given our pre-pandemic record and the absence of a deep culture of preventive medicine, suboptimal performance should not surprise us.

In reality, such a track record is not the fault of individual clinicians, but of health-care systems that are overwhelmingly designed to be reactive rather than proactive. Unlike a response to an adverse event itself, like

a new infection, preventive action often has no trigger event to mandate it. Most health-care systems place less value on preventing problems than on managing them once they occur. Furthermore, we do not have the entrenched mentality that other areas in medicine have built over decades; medical students are rigorously schooled in diabetic screening for macrovascular and microvascular complications, but they know little of the similar risk conferred by rheumatoid arthritis, despite modern therapies.

What, then, is a path forward? Asking our already stretched rheumatology clinicians to simply do more is impractical. Systems must change, and lessons are available elsewhere. We believe this is an opportunity to revisit our approach to preventive medicine in rheumatology, particularly targeting three main pillars: clinician networks, patient engagement, and information systems.

Most rheumatology clinicians believe preventive medicine is important but find it difficult to accommodate within already stretched appointment timeframes. Effective clinician networks can assist, as seen in the management of post-fracture osteoporosis and diabetes, both of which have clear, standardised guidance for primary care clinicians, who are expert in preventive care and are highly trusted by patients. Both areas also engage and elevate specialised clinicians: orthogeriatricians manage osteoporosis risk in patients with hip fracture, and diabetes nurse educators coordinate comprehensive care. Although such specialised care comes at high cost, it has been established and accepted by health-care funders because of health economic rationale and coordinated advocacy. Could similar strategies be applied to infection risk management in patients who are immunosuppressed?

Patient engagement is key; it is clear that patients who are immunosuppressed do not have sufficient knowledge on preventive approaches.<sup>9</sup> This problem is amplified in patients from diverse backgrounds, in whom lower uptake of preventive therapies has often exacerbated health disparities.<sup>10</sup> Real engagement will have multiple components, but effective health promotion in cardiovascular and stroke care has focused on simple and consistent messaging. COVID-19 might provide the opportunity to help patients understand that inflammatory arthritis care affects the whole body, not just the joints—a message that is as applicable to

cardiovascular and mental health as it is to infection prevention.

Finally, COVID-19 prevention efforts have highlighted how siloed information prevents action. We frequently have failed to readily identify patients eligible for preventive therapies due to failures in easily linking vaccination, disease, prescribing, and laboratory data. If we can better identify patients and alert them of developments by text message or app notification with the ease that financial or utility companies do, we can inspire consumer action similar to that seen in the commercial sector.

COVID-19 has led to continuing waves of preventive medicine challenges, the necessity of which has been emphasised by Risk and colleagues' study.<sup>3</sup> To deliver our optimal approach to preventive medicine, despite necessary constant changes and society's fading sense of urgency, we must build better systems, which can serve our patients' broader preventive medicine needs now and in the future.

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## Predicting outcomes in systemic sclerosis by skin involvement and autoantibodies



The Article by Muriel Elhai and colleagues in *The Lancet Rheumatology* reports important data from the international European Scleroderma Trials and Research (EUSTAR) database.<sup>1</sup> The authors assessed whether stratification by systemic sclerosis-specific autoantibodies could predict poor outcomes in systemic sclerosis compared with stratifying by the extent of skin involvement using LeRoy's subsets of limited cutaneous systemic sclerosis, diffuse cutaneous systemic sclerosis, or sine scleroderma,<sup>2</sup> or by using both the extent of skin involvement and autoantibodies. Outcomes of the study, such as survival, progression-free survival, and systemic sclerosis progression, are important to clinicians. The study included 10 711 participants with systemic sclerosis from 159 European centres, analysed data from

the first visit onwards, and compared the findings for patients with incident and prevalent systemic sclerosis, which essentially had the same conclusions.

Most patients had prevalent disease with a long disease duration (mean of 7.9 years [SD 8.2] after first non-Raynaud's symptom). 1647 (15.4%) of the 10 709 patients were men, 9062 (84.6%) were women, and the mean age was 54.4 (SD 13.8) years. 6533 (64.2%) of the 10 176 patients with skin subtype data had limited cutaneous systemic sclerosis, 2895 (28.4%) had diffuse cutaneous systemic sclerosis and 748 (7.4%) had sine scleroderma. At a mean of 4-years follow up (after registry entry), 777 (of 7823; 9.9%) participants with data had died; 2875 (of 7829; 36.7%) had progression-free survival and 2340 (of 6467; 36.2%) had disease progression.



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