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# HERE AND NOW: CLINICAL PRACTICE

Charles J. Kahi, Section Editor

## Reducing the Risk of Vaccine Preventable Diseases During the COVID-19 Pandemic



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Adult and pediatric gastroenterologists and hepatologists often manage patients who are at increased risk for infections as a consequence of their disease or because of their use of immunosuppressive agents. Important patient groups to consider include those with inflammatory bowel disease (IBD), autoimmune hepatitis, cirrhosis, and those after a liver transplant. When including patients older than the age of 65 and the 3% of the general population who are immunosuppressed, it is clear that a substantial number of patients seen in gastroenterology and hepatology practices are at increased risk for infection.<sup>1</sup> Importantly, many of these infections are considered vaccine preventable diseases (VPD); however, in the months after the onset of the coronavirus disease 2019 (COVID-19) pandemic, we have seen rates of immunization, which had already been suboptimal in certain immunosuppressed populations, falling further. This has potentially grave consequences for our patients who, in addition to being at risk for COVID-19 infection, are now at risk for diseases that may have otherwise been preventable.

### Common Barriers to Vaccination Before and During Coronavirus Disease 2019 Pandemic

Immunosuppressed patients in gastroenterology and hepatology practices have historically had low rates of immunization for VPDs. One frequently cited barrier to immunization is uncertainty as to which provider is responsible for recommending and providing age-appropriate vaccines. This may result in a specialist recommending immunization by the primary care provider and that recommendation failing to be implemented.<sup>2</sup> In addition, providers may question the safety and effectiveness of vaccination in an immunosuppressed group. Fortunately, increasing research in this area has offered guidance for special populations, including those on immunosuppressive medications for IBD as well as after solid organ

transplant (Table 1).<sup>2,3</sup> In addition to these common barriers, providers face a new set of challenges because of rapid clinical procedural changes taking place in the setting of COVID-19. Significantly fewer in-person visits are occurring in specialty as well as primary care practices, decreasing the chances for patients to receive their immunizations at office appointments and leading to a significant decrease in the number of vaccines administered. During an approximately 3-month period in 2020 compared with 2019, there have already been more than 400,000 fewer doses of measles-containing vaccines ordered through the Vaccines for Children Program, a federally funded program that provides about 50% of US vaccines to children.<sup>4</sup> Similarly, data from a pediatric population in Michigan now indicate that less than half of children age 2 years and younger are up to date on immunizations.<sup>5</sup> Data in the adult population are only beginning to emerge. In the state of Wisconsin, number of vaccines administered in the year 2020, which before the pandemic had outpaced the average number of vaccines administered during the past 5 years, fell to fewer than half of the number that had been seen previously as COVID-19 cases increased and policies were put in place to reduce the spread of the virus. In those patients aged 19 years and older, number of vaccines administered as compared with previous years declined even more sharply (Figure 1). Decrease in the number of vaccines administered may result in loss of herd immunity for certain VPD, such as measles, polio, and diphtheria, and increase the risk of a VPD outbreak, a potentially dangerous scenario for immunosuppressed populations in the setting of an already strained healthcare system.

**Abbreviations used in this paper:** COVID-19, coronavirus disease 2019; IBD, inflammatory bowel disease; VPD, vaccine preventable diseases.

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**Table 1.** Adult Immunization Schedule for Patients With Gastrointestinal Conditions

Vaccine	Dosing schedule	
Standard dose quadrivalent influenza vaccine, inactivated	1 dose seasonally for all patients aged 18–64 years	
High dose influenza vaccine, inactivated or adjuvanted influenza vaccine, inactivated	1 dose seasonally all of those $\geq 65$ years	
Influenza live attenuated	Not indicated for those on immunosuppressive therapy	
Tetanus, diphtheria, pertussis	If previously immunized, single dose of Tdap, then Td or Tdap every 10 years, as well as Tdap during third trimester of each pregnancy	
Zoster recombinant (preferred)	2 dose series for all $\geq 50$ years administered 2–6 months apart	
Zoster live	Use only if immediate immunization is necessary, RZV is unavailable, and patient is immunocompetent. Not available in US after July 1, 2020.	
Human papillomavirus	Age 18–26 years, 3 doses 0, 1–2, and 6 months	Age 27–45 years, 3 doses if likely to have new sexual partners
Pneumococcal conjugate 13 valent & polysaccharide 23 valent	For all patients initiating or on immunosuppression: a single dose of PCV13 followed by PPSV23 in 8 weeks; may repeat PPSV23 after 5 years plus For patients with chronic liver disease age 18–64 years: a single dose of PPSV23 A single dose of PPSV23 for all ages 65 and older.	
Hepatitis A	2 dose series Hep A (Havrix or Vaqta 6–12 months apart) or 3 doses series Hep A-Hep B (Twinrix at 0, 1, 6 months)	
Hepatitis B	Energen or Recombivax: 3 dose series on 0-, 1-, 6-month schedule <sup>a</sup> 3 dose series Hep A-Hep B (Twinrix at 0, 1, 6 months)	HepBisav: 2 dose series (HepB-CpG) at 0 and 1 month <sup>a</sup>
Meningococcal A, C, W, Y (Men ACWY); MenB	Adults with risk factors <sup>b</sup> should receive immunization. If risk factors continue to be present, MenACWY every 5 years; MenB 1 year after completing series and then every 2–3 years.	
Measles, mumps, rubella live attenuated	2 doses at least 4 weeks apart if previously did not receive any MMR or 1 dose if previously received 1 dose MMR. Contraindicated in those receiving systemic immunosuppression.	

Table 1. Continued

Vaccine	Dosing schedule
Varicella live attenuated	No history of disease or vaccine or no laboratory evidence of immunity, 2 doses 4–8 weeks apart. Contraindicated in those receiving systemic immunosuppression.

Hep A, hepatitis A vaccine; Hep B, hepatitis B vaccine, LAIV, influenza live attenuated; MMR, measles, mumps, and rubella; PCV13, 13 valent pneumococcal conjugate vaccine; PPSV23, 23 valent pneumococcal polysaccharide vaccine; RZV, recombinant zoster vaccine; Td; tetanus diphtheria; Tdap, tetanus diphtheria acellular pertussis; VAR, varicella; ZVL, zoster live; 9vHPV, human papillomavirus 9 valent.

<sup>a</sup>Check antibody to the surface antigen (anti-HBs) 4–8 weeks after completing series.

<sup>b</sup>Those in college residence halls if routine adolescent immunization missed, military recruits, outbreaks, and specific immunocompromising conditions, including asplenia, complement deficiency, and human immunodeficiency virus.

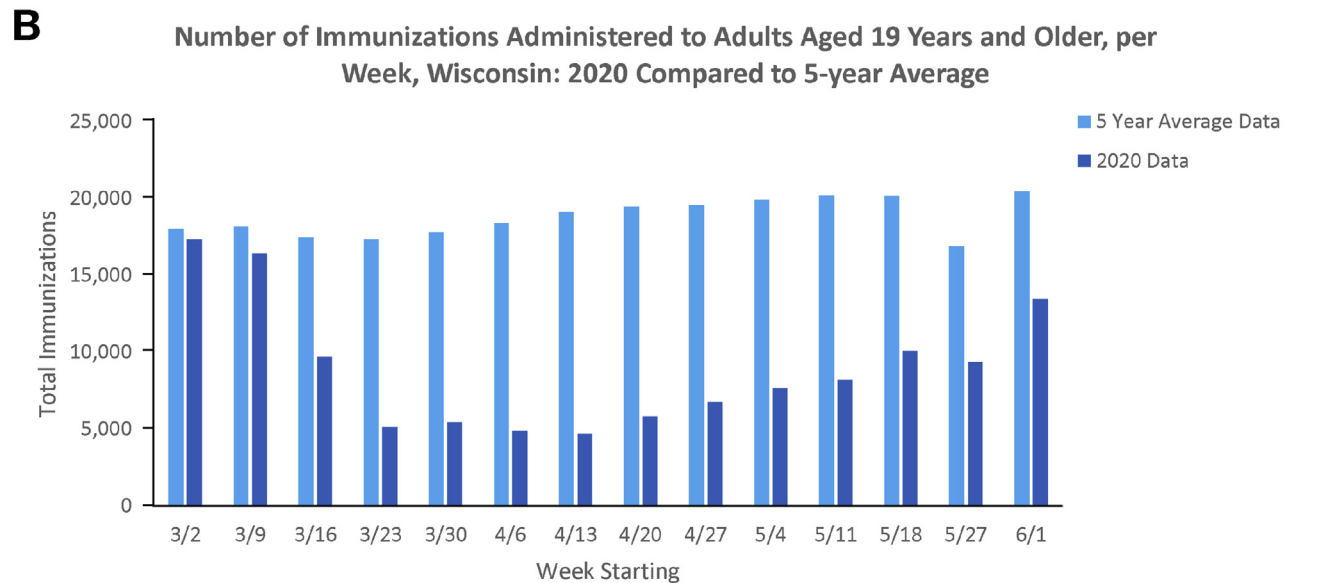
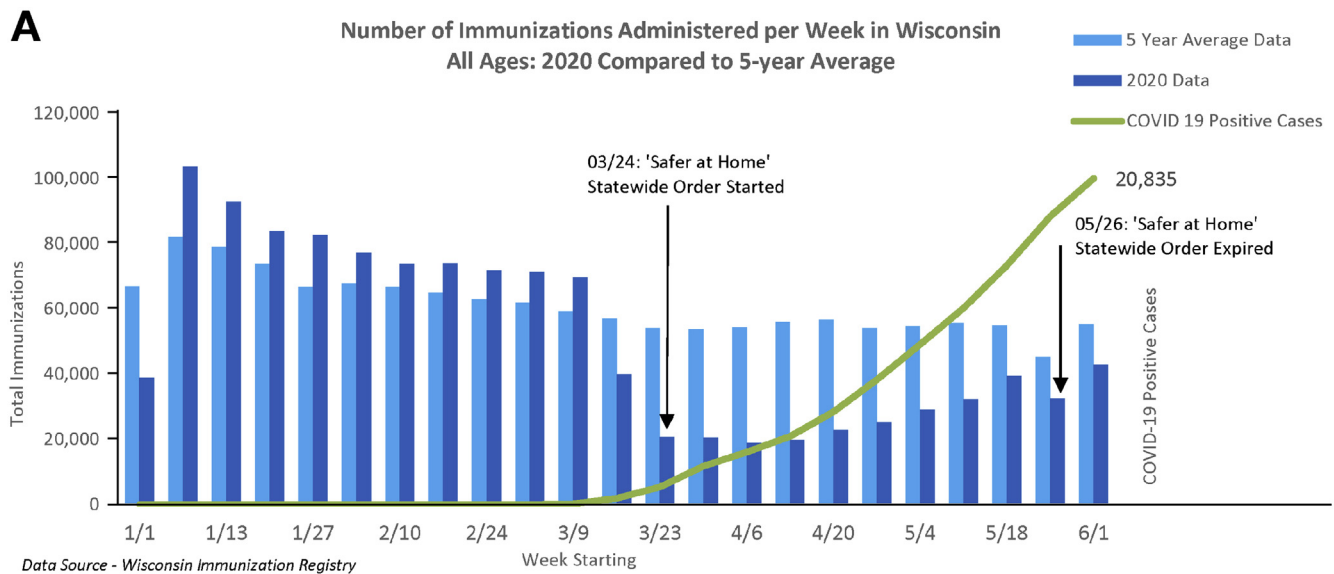


Figure 1. All and adult immunizations administered in the state of Wisconsin during the COVID-19 pandemic compared to the 5-year average. COVID-19, coronavirus disease 2019.

**Table 2.** Relevant Community Preventive Services Task Force Evidence-based Strategies for Increasing Immunization in Gastroenterology and Hepatology Clinics During COVID-19<sup>7</sup>

Intervention	Level of evidence <sup>a</sup>	Example
Client reminder and recall systems	Strong	Reminder letter or message to patient
Provider assessment and feedback	Strong	Evaluate provider or practice performance
Provider reminders	Strong	Prompt in electronic health record to administer vaccine
Standing orders	Strong	Delegation protocols so medical assistant, nurses, or pharmacist can provide vaccines
Immunization information systems	Strong	State immunization registries
Home visits	Strong	Healthcare worker administering vaccine during routine home visit
Healthcare system-based interventions implemented in combination	Strong	Multiple proven interventions including standing orders, provider reminders, assessment and feedback, client reminders, and expanded access
Increase access	Strong	Immunization in infusion center, blood draws, local pharmacies

<sup>a</sup>Level of evidence is based on several factors including study design, number of studies, and consistency of the effect across studies.

## Strategies to Improve Vaccination Rates During the Coronavirus Disease 2019 Pandemic

Several variables must be taken into account when determining the balance of risk and benefit in administering routine immunizations in the midst of a pandemic. According to the World Health Organization, these variables should include the epidemiology of the VPD, the epidemiology of COVID-19 in that region, the ability of the healthcare system to deliver vaccines, and the supply of the vaccine.<sup>6</sup> Because both COVID-19 and VPD such as influenza or invasive pneumococcal disease are threats to our immunosuppressed patients, we must take advantage of alternate opportunities to deliver vaccinations in ways that do not increase patients' exposure to the disease.

We propose several possible strategies for specialists to lead this effort and are currently working to improve and implement these measures at our own institutions. First, we believe it is necessary to use the opportunity of any in-person office visit to administer immunizations rather than recommending they be administered by another provider. The Community Preventive Services Task Force, a group of population health experts established by the US Department of Health and Human Services, offers several evidence-based directives to improve immunization rates that are practical in a

specialty clinic and have durable results. These include client recall systems, provider reminders, standing orders (ie, a protocol put in place to allow non-physician providers to prescribe and administer appropriate vaccines without a physician order), and immunization information systems such as access to state immunization registries (Table 2).<sup>7</sup> Ideally these strategies are used in tandem and embedded in the healthcare system; however, even simple measures such as receiving personal feedback on immunization rates can serve to increase these rates. Similarly, previous work has shown that easily implemented specialty care clinic systematic approaches (ie, patient completion of a questionnaire regarding immunization history that is then verified by a provider so office staff can administer vaccines) can greatly improve vaccination rates.<sup>8</sup> Now is the time to improve immunization rates in our specialty practices; however, we recognize that many patients are not being seen in specialty offices and instead primarily seen via telehealth. For those patients, efforts should be made to add vaccine appointments to other in-person healthcare appointments, including blood draws, endoscopic procedures, imaging studies, nurse appointments, or any other in-person ancillary appointment. Visiting nurses who may already see patients for medication management or infusions of biologics or total parenteral nutrition, for example, may also administer immunizations. At our own institutions, we are planning to administer

influenza and pneumococcal vaccines at infusion centers during patients' already scheduled appointments. Local pharmacies can also be a valuable resource because patients may instead be travelling there to pick up prescriptions, and often pharmacies offer extended hours when there is likely to be little foot traffic. They also typically have ample supply of other vaccines in addition to influenza, including pneumococcal, Tdap, and the new recombinant herpes zoster, which can at times be limited in clinics. Local primary care physicians can also still be used, but extra measures should be taken to ensure that appropriate vaccines are administered by having gastroenterology nurses or transplant coordinators help to communicate directly with these providers.

### Take-Home Message for Gastroenterology and Hepatology Providers

Improving vaccination rates in our immunosuppressed population should be an effort led by gastroenterologists and hepatologists. As we lose opportunities to immunize patients in the office, we must rely on these strategies listed above to ensure that herd immunity is not lost to certain VDP and to prevent the potentially dangerous scenario of multiple simultaneous epidemics. Combinations of interventions, particularly those that are embedded in the healthcare system, are effective and have durability. The improvements we make to increase accessibility to vaccines will continue to be important after the pandemic because many changes resulting from COVID-19, such as fewer in-person visits and more telehealth, will likely persist in some capacity indefinitely. Preventive health remains of high importance even in a pandemic, and eventually these strategies we develop now can be used to effectively administer COVID-19 vaccines in the future.

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#### Conflicts of interest

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