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Global Pediatric Pulmonology Alliance (GPPA) proposal for COVID-19 vaccination in children

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Coronavirus disease 2019 (COVID-19) remains a global epidemic. As of August 18, 2021, the number of reported cases has exceeded 207 million globally, with more than 4.3 million deaths. COVID-19 has brought devastating losses to human society. The overall crude mortality rate is 1–3%. Although pediatric deaths from COVID-19 are rare, they do occur, as over 9,000 children have died from COVID-19 globally to date [1]. With the gradual and broad application of COVID-19 vaccines around the world, the rising proportion of cases among children and unvaccinated young adults demands attention. According to World Health Organization surveillance data, the proportion of children reported to have COVID-19 has increased. Between January 2020 and July 2021, the percentage of cases that occurred among children less than 5 years of age doubled, from 1% to 2%, and cases among 5–14 years more than tripled, from 2.5 to 8.7%. Between the initial stage of COVID-19 and the launch of vaccination efforts, children's COVID-19 infections were primarily family based, having been transmitted from adult to child. Recent variants, including the delta variant, appear to be transmitted more commonly in the young [2]. Widespread adult vaccination with an increase in the proportion of childhood cases suggests that pediatric cases may become

an important and growing source of COVID-19 infection in communities if children remain unvaccinated.

In addition to directly suffering from COVID-19, children suffer indirectly from the pandemic [3]. By April 2021, an estimated 860,000 children have been orphaned or have lost a custodial grandparent due to a COVID-19 death [4]. Many children have been pushed into poverty or have become malnourished as an indirect result of the pandemic [1]. During school closures, children miss educational opportunities, some of which cannot be replaced and may lead to lower lifetime earnings [5]. Therefore, protecting people who protect children—parents, grandparents, teachers, school staff, health care workers and others—is an important priority for COVID-19 vaccination as recommended by the WHO, especially while supplies of COVID-19 vaccine are limited [6].

It is well-recognized that vaccination is the best approach to stop COVID-19 epidemics. Vaccines help achieve a degree of community protection by establishing an immune barrier in the population rather than allowing massive spread of infection. Children and adolescents under 18 years of age are more than a quarter of the world's population. Immunity among children will be essential to achieve a level of population immunity high enough to dampen out community transmission. Children should be considered for COVID-19 vaccination not only for direct protection, but also because they contribute to transmission in families, day-care facilities, and schools, as exemplified by an outbreak in Australia [7].

There is a large and growing experience with COVID-19 vaccines. As of August 2021, over 4.4 billion doses of various COVID-19 vaccines have been administered to adults [8]. Protective effectiveness of the vaccines, including reducing infection and transmission, disease severity,

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hospitalization, and death, have been affirmed along with their safety. Clinical trial and real-world evidence of safety and effectiveness of COVID-19 vaccines in children continues to accrue and is essential to be monitored carefully.

Proposal

To protect children and to prevent and help control COVID-19, the Global Pediatric Pulmonology Alliance (GPPA) organized an expert group to consider vaccination of children against COVID-19. Relying on evidence-based medicine and best practices in different nations, GPPA recommends that global and local organizations, medical societies, and health agencies join forces and commit fully to the protection of children from the harms caused by COVID-19.

People who protect children and interact with children, such as parents and family members, educational staff, and health care workers, should be protected through COVID-19 vaccination.

GPPA seeks to promote COVID-19 vaccination of children, incrementally, age group by age group, as COVID-19 vaccines are approved for administration to children and are recommended for children by national health authorities.

Measures to promote vaccination include strengthening education about direct and indirect benefits and safety of COVID-19 vaccination; enhancing public awareness of emerging recommendations for childhood vaccination; implementing recommended COVID-19 vaccinations of children by notifying families of recommended vaccination; making appointments to vaccinate as early as feasible; and vaccinating in a timely manner to reduce risk of COVID-19 outbreaks among children.

We believe that schools and communities should strengthen public education about children's vaccination policies, the safety of COVID-19 vaccines, and recommendations from clinical experts. Countries and regions where conditions permit should consider free vaccination in schools and community settings to increase vaccination rates. For countries and regions, where COVID-19 vaccination has not yet been included in national immunization plans, pediatricians should advocate for evidence-informed inclusion of children in national immunization programs.

Pediatricians can contribute to COVID-19 vaccination of children by:

- Contributing expertise to health authority advisory groups that make recommendations for COVID-19 vaccination;
- Closely following the progress of regulatory actions for COVID-19 vaccination of children, including ages and children's medical conditions for which vaccines can be administered;
- Becoming familiar with emerging COVID-19 vaccine recommendations for children in their country or region;

- Learning and keeping up-to-date with pediatric COVID-19 vaccine-specific indications, contraindications, and precautions;
- Lending expertise to training sessions on best practices for COVID-19 immunization;
- Using recommended best practices for COVID-19 vaccination in their own practices;
- Ensuring full-series vaccination of all eligible children in their practice;
- Reporting to health authorities breakthrough infections that occur after full-series vaccination;
- Reporting to health authorities adverse events possibly related to COVID-19 vaccination.

An increasing number of COVID-19 vaccines are being approved for children by national regulatory authorities, and as evidence accrues the age range for vaccination is expanding to younger children. The indications for vaccination are expanding to ensure protection of children with serious comorbidities. Once eligible by age or by medical condition, children should be vaccinated as soon as feasible.

COVID-19 vaccines tend to be most effective at preventing serious illness and death, and less effective at preventing mild or asymptomatic infections. Because people with mild or asymptomatic infection, or those who are pre-symptomatic, are able to infect others, non-pharmaceutical interventions notified locally should always be observed and recommended to families, for schools, and for medical facilities and other places serving children.

School, kindergarten and day-care staff should be fully vaccinated for their protection and for the protection of children. Public awareness and education efforts about infectious disease prevention and control and about vaccination should be made to increase vaccination rate and to prevent outbreaks. Children's family members and frequent visitors (such as caregivers, domestic service personnel, etc.) should be vaccinated.

Pediatric staff who have contact with children should be fully vaccinated. Because of the significantly increased transmission capability of COVID-19 variants, other staff in medical institutions, such as hospital sanitation workers and porters, also should be vaccinated. This will help protect pediatric workers and maintain medical care capacity by reducing staff sick leave risk of nosocomial infections.

Vaccination procedures

Pediatricians should consistently use general best practice guidelines for immunization in their COVID-19 vaccination effort. Using COVID-19 vaccines as approved and as recommended by health authorities will help ensure timely, safe, and effective protection of children. Pediatricians should ensure that all eligible children in their care are vaccinated

as expeditiously as possible, including children eligible by age and by medical condition or health status.

Children with chronic non-immune related diseases or with immune system disorders may have serious cases of COVID-19. Efforts need to be made to find appropriate safe and effective candidates from among the various types of available COVID-19 vaccines.

Pediatricians should screen for contraindications prior to vaccination. Contraindications to vaccination should follow national guidelines from health authorities and manufacturer prescribing instructions. Vaccinating professionals should become and stay familiar with COVID-19 vaccine contraindications, as these will change with emerging evidence and experience. In general, vaccination is contraindicated for individuals allergic to any ingredient of the vaccine, including substances used in the production process, or for individuals who have had an allergic reaction to a similar vaccine. Vaccination is usually contraindicated for individuals who have had a severe allergic reaction to vaccines in the past.

Pediatricians should screen for precautions before vaccination. Precautions for COVID-19 vaccination are specific to the vaccine and will change as evidence accrues. In general, precautions do not preclude vaccination, but they should be considered and discussed with parents/guardians before vaccinating. Precautions often include fever and acute illness, exacerbation of chronic illness, and history of Guillain–Barré syndrome. Pediatricians should keep up-to-date on the list of precautions for pediatric COVID-19 vaccination in their local area or region.

Most health authorities recommend a brief, 15–30-min observation period after vaccination to identify and treat any immediate, severe allergic reaction among eligible adults. Follow-up care includes evaluation of medical concerns following vaccination and reporting of suspected adverse reactions and breakthrough infections to health authorities for evaluation. The same should be extended to include all eligible children as the vaccine is made available for them.

In summary, as soon as COVID-19 vaccines are approved and recommended for children, pediatricians should contribute their immunization expertise, advocate for inclusion of children in national COVID-19 immunization programs, and ensure timely vaccination of all eligible children in their practice and local area. As strong advocates for children, pediatricians can help safeguard children toward a healthy

future and can contribute to the global effort to control the COVID-19 pandemic.

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Compliance with ethical standards

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