



## Global Pediatric Pulmonology Alliance recommendation to strengthen prevention of pediatric seasonal influenza under COVID-19 pandemic

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The World Health Organization (WHO) announced COVID-19 as a global pandemic in March of 2020 [1]. The COVID-19 pandemic may persist for a long period of time. Global prevention and control becomes a complex and challenging task, and such efforts should be sustained. Although general measures, such as social distancing, face masks, respiratory hygiene and hand sanitization, will bear fruits for decreasing spread of other respiratory illnesses including influenza, the specific prevention through vaccination is a key focus especially in the upcoming winter and spring seasons [2].

Winter and spring are the peak seasons for influenza and other common respiratory infectious diseases. Children are a high-risk group for influenza. The prevalence of influenza in children is 20–30% every year [3], and it often enhances outbreaks in the community. The pediatric population in child care centers, kindergartens and primary schools is closely confined and is vulnerable to mass outbreaks [4]. The high infection rate of influenza in children is also one of the important reasons for the spread of influenza virus in the community [5]. If an outbreak of influenza coincides with that of COVID-19, the impact on the pediatric population will be even more severe [6].

According to WHO, the COVID-19 outbreak in early 2020 occurred at the same time as the influenza outbreak [7], and the primary clinical manifestations of influenza and COVID-19 overlap considerably. An epidemic of influenza

would challenge the diagnosis and treatment in fever clinics and the supplies of personal protective equipment (PPE). Therefore, the upcoming winter and spring seasons are of high alert [8], as immense pressure will be placed on hospitals' overall diagnosis and treatment capacity and on their critical care capacity. Co-infection of influenza and COVID-19 can occur in patients and present with severe symptoms. This will further increase the complexity of clinical diagnosis and treatment [6]. Hospitals usually have concentrated patient flows, and the risk of cross infection is increased, which threatens the health of all patients, their caregivers, and medical staff members.

The WHO, the United Nations International Children's Emergency Fund (UNICEF), and various nations have called for strengthening of prevention and control of seasonal influenza while making every effort to cope with the COVID-19 pandemic. These organizations vigorously advocate influenza vaccination as the primary measure for pandemic prevention and control, so as to minimize the interference of an influenza epidemic during the prevention and control of the COVID-19 pandemic situation. According to the WHO recommendation, influenza vaccination is an effective supplementary measure against the COVID-19 pandemic for countries that are about to enter the winter. All eligible individuals should receive the influenza vaccine [2]. UNICEF calls for influenza vaccination for children during the COVID-19 pandemic to protect them from other diseases [9]. The US Centers for Disease Control (CDC) stated that in the coming winter influenza and COVID-19 may spread simultaneously and recommended vaccination for all children older than 6 months [10]. The Australian government strongly recommends that people, especially children

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and other high-risk groups, should be vaccinated with influenza vaccine when actively coping with the possible overlap of COVID-19 and influenza [11]. The British public health agency also stated that owing to the COVID-19 outbreak, influenza vaccination is more important than ever before [12]. New Zealand called for vaccination for high-risk target populations [13] (such as children, seniors and pregnant women) to protect communities and to utilize resources most effectively. Brazil initiated early vaccination to reduce influenza cases in the midst of COVID-19, with children from 6 months to 6 years of age being the priority target population [14]. Thus, preschool-age and younger children are the key vaccination population, and influenza vaccination is the best preventive measure.

## Recommendations

To control the pandemic situation more effectively, the Global Pediatric Pulmonology Alliance (GPPA), based on best-practices and evidence from various countries, recommends that all global and regional organizations, medical societies, and health agencies join hands in the prevention of seasonal influenza in children. Measures to improve influenza vaccination include promoting public awareness about infection control measures and thorough education of the benefit of influenza vaccination. The ultimate goal is to achieve early notification, early appointment and early vaccination, which will reduce the likelihood of coincident epidemics of influenza and COVID-19 this winter. It is recommended that vaccination policy, vaccine safety, and medical advice be promoted and reiterated in child care centers, kindergartens, and schools [15]. Countries and regions with ample resources should implement free influenza vaccination in child care centers, kindergartens and schools, so as to increase the coverage rate of influenza vaccination among the pediatric population [16]. It is also advised that in countries or regions, where influenza vaccination may not be part of national immunization program (NIP), pediatricians should check with respective health authorities or local guidelines to reach the suggested beneficiary population.

## Strategies in influenza vaccination

### (1) Infants under 6 months

Influenza vaccine cannot be given to infants under 6 months. We recommend parents, caregivers, and family members of the infants to be vaccinated [4], and if included in national recommendations, expectant mothers should receive influenza vaccination during pregnancy to protect themselves and protect newborns from influenza infection during their first six month of life.

### (2) Children over 6 months and school-age children

This is the priority population for influenza vaccination. All children over 6 months of age are eligible, except for those who are allergic to vaccine substances/components or who are experiencing fever or an acute infection. Children with a history of egg allergy of any severity can receive any licensed, recommended, and age-appropriate influenza vaccine. Children with stable chronic pulmonary, cardiovascular, renal or neurological diseases should get the influenza vaccine as early as possible [4]. Children with primary immunodeficiency, HIV infection and secondary immunodeficiency (leukemia, carcinoma, receiving immunosuppressive therapy, etc.) should consult with medical professionals before using live attenuated influenza vaccines.

## Schools and kindergartens

Staff should be vaccinated every year [17]. Schools and kindergartens should carry out awareness and education campaigns on prevention and control of infectious diseases and on promotion of vaccination to students and parents, so as to improve vaccination rates and to prevent the outbreak of clustering epidemic [17, 18]. Family members of children and frequent visitors (such as caregivers, housekeeping workers, etc.) also should be vaccinated annually [17].

## Pediatric health care workers

Pediatric medical staff and workers are in frequent and close contact with children. They should be vaccinated every year. This should also be considered for other staff groups, such as hospital cleaners and porters. This protects the pediatric health care workers, maintains health care capacity by reducing sick leave, and also helps to reduce transmission from members of staff to children and others, thereby reducing the risk of hospital-acquired infections. It is a concern that shedding of influenza virus has been shown shortly before clinical illness develops and that health care workers frequently continue to work while unwell.

## Vaccination schedule

Influenza vaccine needs to be given every year. Countries and regions around the world should prepare ample vaccine supplies and should complete vaccination of the pediatric population about 2–3 months before the arrival of the influenza season [4]. Although the GPPA is advocating vaccinations (as described above), public health priorities may differ across nations; therefore, pediatricians should check their national guidelines for the eligible population, available vaccine products and the number of doses to

administer based on age, vaccination history, and vaccine product to make a final call.

## Vaccination methods

The inactivated vaccine is to be injected intramuscularly (except intradermal injection preparation). Children over 1 year and adults should be vaccinated in the deltoid muscle of the upper arm as the first choice. The anterolateral thigh is the best vaccination site for infants between 6 months and 1 year. Patients with thrombocytopenia or other hemorrhagic diseases may have the risk of bleeding during intramuscular injection; so subcutaneous injection is recommended. Injection dosage should be referenced to the product specification.

## Precautions for vaccination under COVID-19 pandemic

- (1) Parents should make an appointment before vaccination and arrive at the vaccination site on time, so as to avoid crowding at the site.
- (2) Parents or individuals accompanying children for vaccination should wear protective masks (such as surgical masks) and keep a physical distance of more than 1 m (1.8 m is required in the US) from others.
- (3) Parents or individuals accompanying children should use face masks and should follow strict hand hygiene and routine disinfection according to instructions of medical staff before vaccination.
- (4) After vaccination, parents should take the child to a designated area for routine observation and then go home immediately to avoid a prolonged stay in the facility or other public areas.
- (5) Children and their parents or caregivers should apply hand hygiene and should dispose of face masks properly after returning home.
- (6) After returning home, parents should observe the overall health of the child, keep his/her vaccination spot clean, and watch for possible complications of vaccination.
- (7) Expert advice should be available to support vaccination staff in answering questions about vaccine eligibility.

In conclusion, under the COVID-19 pandemic, getting the influenza vaccine in time offers children a safer winter and a healthier future.

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