Position paper

COVID Vaccines in Adolescents and Young Adults

The Society for Adolescent Health and Medicine

ABSTRACT

Worldwide, a number of COVID-19 vaccines have been approved or granted Emergency Use Authorization (EUA) or Emergency Use Listing for adolescents and young adults (AYA), which has brought hope to many across the globe. Extension of the EUA for a COVID-19 vaccine to children and adolescents aged 5 through 15 years is exciting news for children, adolescents, parents, and providers of AYA. Many countries around the globe have extended immunization against COVID-19 to younger age groups. At the same time, the COVID-19 pandemic has led to a decrease globally in administration of other adolescent vaccines. This highlights that vaccine recommendations do not necessarily lead to successful and equitable vaccine distribution, and overcoming barriers to vaccination is critical. Certain subpopulations of AYA, particularly those who are marginalized/underrepresented, do not receive appropriate health care. AYA should be offered protection against all vaccine-preventable illnesses at every opportunity. Creating innovative strategies to improve vaccine uptake among AYA should be encouraged.

© 2022 Society for Adolescent Health and Medicine. All rights reserved.

Positions of the Society for Adolescent Health and Medicine

1. The Society for Adolescent Health and Medicine supports the use of recommended COVID-19 vaccines for adolescents and young adults (AYA).
2. Strategies should be implemented to ensure equitable allocation of vaccines to historically and currently marginalized/underrepresented youth that include addressing medical distrust among racial and ethnic communities of color as a barrier to AYA vaccination.
3. Age-appropriate vaccines should be coadministered with COVID-19 vaccines.
4. Collaboration should be fostered with entities that facilitate improving AYA vaccination rates and vaccine equity.

Statement of the Problem

The worldwide COVID-19 pandemic has contributed to a global decline in immunization rates in AYA. Although immunization rates are starting to improve in the United States, they are still suboptimal and there are groups of AYA who have had and continue to have delayed vaccinations [1]. Approval of COVID-19 vaccines for adolescents aged 16 years and older and Emergency Use Authorization (EUA) in the United States of COVID-19 vaccines for adolescents and children as young as 5 years of age are recent developments in the battle against SARS-CoV-2. The recommendation to vaccinate younger patients has been adopted by several countries around the world including, but not limited to, Australia, Brazil, Canada, India, Turkey, and the United States [2]. As knowledge of new vaccines and the novel coronavirus continue to evolve, this position seeks to help guide clinical providers on recommended immunization practices. It is also important to ensure that youth are protected against other vaccine-preventable illnesses in the context of the current COVID-19 pandemic. The COVID-19 pandemic has highlighted the need to reduce ongoing health disparities that have historically been poorly addressed. These include ensuring that underrepresented/marginalized youth around the world are offered appropriate opportunities to access preventive measures, care, and treatment. Creating strong connections within communities and immunization champions, including AYAs, could further advance vaccine advocacy efforts.

Methods

These recommendations are based on extensive reviews of current literature, policies, and practice guidelines. They include
an agreement of expert multidisciplinary opinions of contributing authors.

Positions and Recommendations

**Position 1: The Society for Adolescent Health and Medicine supports the use of recommended COVID-19 vaccines for AYA**

COVID-19 poses a significant threat to the health of AYAs. This is particularly true given the sequelae of COVID-19 infection, which can include a range of illnesses such as multi-system inflammatory syndrome in children and myocarditis, complications that can result in hospitalization, long-term health problems, and death [3]. Although, AYAs are more likely to experience mild forms of COVID-19 than older adults, they can still develop chronic (also known as “long-haul”) symptoms [4,5] and can die from the disease. It has been estimated that 14.5% of infected adolescents aged 12–16 years have persistent symptoms 5 weeks postinfection [4]. Moreover, there are data demonstrating that some AYA can develop chronic symptoms (persisting for at least 6 months) such as headaches, chest pain, fatigue, dyspnea, and memory problems. SARS-CoV-2 post-infectious neurologic sequelae (including encephalopathy, Bell’s palsy, meningitis, and transverse myelitis) have been found in patients as young as 9 months of age [6]. These findings vary based on study design and case definition, and information continues to evolve in this regard.

COVID-19 vaccination of youth is central to protection of personal and public health. Moreover, vaccination, along with universal masking, hand washing, appropriate physical distancing, and isolation, are essential strategies to prevent further spread and mutations of SARS-CoV-2, given the ongoing complexity and evolution of the COVID-19 pandemic ([7,8]). National and global efforts to comply with infection mitigation (such as physical distancing and proper use of face masks) have been challenging, even in the face of more infectious variants of SARS-CoV-2. Quarantine, isolation, and their downstream effects on school attendance, as well as the inability to participate in normal extracurricular activities, have negatively impacted AYA psychosocial development.

In December 2020, the first approved COVID-19 vaccine in the United States (Pfizer–BioNTech BNT162b2 mRNA) was granted the EUA for persons aged 16 years and older [3]. In May 2021, the US Food and Drug Administration (FDA) expanded the EUA for this COVID-19 vaccine to include adolescents aged 12–15 years [9]. In June 2021, after review of cases of vaccination-associated myocarditis, the US Advisory Committee on Immunization Practices determined that the benefits of vaccination for AYA outweighed the risks [10]. Subsequently, in late August 2021, the FDA granted full approval of the vaccine for administration to individuals aged 16 years and older [3]. More recently, at the end of October 2021, the FDA extended its EUA to include individuals as young as 5 years of age, a change supported by the American Academy of Pediatrics [11,12]. In December 2021, in the United States, the Pfizer–BioNTech vaccine (Comirnaty) was fully approved for youth aged 16 years and older and has EUA for children aged 5–15 years. In January 2022, in the United States, Moderna COVID-19 vaccine (Spikevax) was fully approved for youth aged 18 years and older [13]. Globally, there are other COVID vaccines that have been approved by the World Health Organization (WHO) including those made by Moderna and Johnson and Johnson [2]. The Pfizer–BioNTech vaccine is highlighted given its specific indication for adolescents aged 12 years and older.

Encouraging AYA and parents of adolescents to accept COVID-19 vaccination will offer some protection against SARS-CoV-2 infection/transmission and robust protection against severe COVID-19 disease, hospitalization, and death. In the United States, the EUA COVID-19 vaccine for persons aged 12 years and older has shown efficacy against symptomatic infection to be as high as 93% [14]. Vaccination of immunocompromised AYA is important. Including AYA who are pregnant and lactating in immunization programs also contributes to efforts to protect the wider community. The WHO Strategic Advisory Group of Experts endorses vaccinating individuals aged 5 years and older against SARS-CoV-2 [15]. However, each country can implement a rollout strategy that differs from WHO recommendations due to various factors including cost and dissemination challenges.

Approved vaccines are safe and effective. Historically, there are robust data on prior vaccines demonstrating that if significant vaccine side effects occur, they appear within 2 months of administration [16]. In the United States and globally, there continues to be ongoing safety monitoring of vaccines postlicensure [17]. Given that it has been over 12 months since initial phase 3 trials for COVID-19 vaccines were completed, it is reassuring that no significant long-term side effects have been identified, and it is unlikely that any will be identified in the future.

There are data showing that 36% of patients do not produce antibodies to SARS-CoV-2 postinfection [18]. Similarly, antibodies wane 60 days postinfection [19]. There is risk of reinfection post COVID-19 [20]. Hence, vaccination also is recommended for those previously infected with SARS-CoV-2, as natural immunity due to infection is variable and wanes over time. In January 2022, due to waning immunity after vaccination, the US Centers for Disease Control and Prevention recommended that adolescents aged 12–17 years old receive a booster shot 5 months after their initial Pfizer–BioNTech vaccination series [21].

**Position 2: Strategies should be implemented to ensure equitable allocation of vaccines to historically and currently marginalized/underrepresented youth that include addressing medical distrust among racial and ethnic communities of color as a barrier to AYA vaccination.**

Vaccine equity, ensuring that all groups, but particularly those at greatest risk for COVID-19 infection and sequelae, are provided with adequate vaccine access, is key to controlling the COVID-19 pandemic. However, the pandemic has challenged health-care systems across the world and magnified health inequalities [22]. COVID-19 has disproportionately affected communities of color [23,24]. In addition, there is differential uptake of COVID-19 vaccine globally [25]. No one is safe until everyone is safe. Pediatric deaths, case fatality rates, and intensive care unit admission of children are significantly higher in low-/middle-income countries than in high-income countries. These findings underscore the greater need for vaccination of children in low-/middle-income countries for the global prevention of COVID-19 [26]. Furthermore, with most of the world’s population unvaccinated, more contagious and virulent variants will undoubtedly emerge, extending and possibly worsening the pandemic globally.

Social determinants of health such as physical environments, access to health care services, racism, education, income, and social status as well as employment and working conditions have
Researchers have attempted different methods to increase vaccine uptake. Unity Consortium is a US-based organization that collaborates with groups that also have a vested interest in improving immunization rates for AYA (Adolescent Young Adult) populations. The consortium aims to work on the development of adolescent consent formation, and improve education efforts. One such example is the online web platform, Teens for Vaccines.

Immunization rates in pediatric (especially adolescent) populations plummeted due to various national and international restrictions as an initial response to the COVID-19 pandemic [27]. In order to effectively catch up on missed doses, it is imperative that vaccines be administered at every feasible opportunity. Hence, offering protection against other vaccine-preventable diseases as well as COVID-19 should be a priority. There is no need to delay administration of routine recommended vaccines in favor of COVID-19 vaccination and vice versa.

Position 3: Age-appropriate vaccines should be coadministered with COVID-19 vaccines.

Adolescent vaccination rates often lag behind immunization rates for younger children [28]. Clinicians should continue to be creative when designing strategies to increase adolescent immunization rates. One approach could include collaboration with social media influencers whenever feasible to combat vaccine misinformation and vaccine hesitancy. Similarly, using schools as a venue for vaccine administration could enhance vaccine access and delivery. Generally, school-based vaccination programs are effective at achieving high coverage rates for immunizations and in many countries have high levels of support from parents/guardians [29].

There are challenges to immunizing marginalized youth, and researchers have attempted different methods to increase vaccine uptake in these populations [30]. In addition to the logistical issues, such as transportation and location of vaccination centers noted above, there continues to be ongoing concerns regarding consent for immunization of adolescents. There is much need for outreach strategies to community settings where young people congregate and to work on the development of adolescent consent procedures.

Vaccine misinformation is another well-described barrier to vaccine uptake. This challenge can be addressed by encouraging the use of peer advocates to build trust, combat vaccine misinformation, and improve education efforts. One such example is the online web platform, Teens for Vaccines [31].

Efforts should be made to create avenues to enhance vaccine uptake and equitable delivery by working with groups that also have a vested interest in improving immunization rates for AYA [32]. Unity Consortium is a US-based organization that collaborates with clinicians, researchers, and health policy experts on devising strategies to specifically improve adolescent vaccine uptake [33]. The National Institute of Allergy and Infectious Disease led a community partnership COVID-19 prevention network which ensured that community participants had information regarding COVID-19 vaccine trials and fostered discussions to improve vaccine uptake [34]. Also, AYAs need to be codesign partners in developing strategies and messaging to assist with achieving maximal reach and engagement by young people [35].

Summary

Providers who care for AYA have unique opportunities to have positive impacts on their patients’ physical and emotional health. During these challenging times, every effort to control the spread of SARS-Cov-2 should be used if deemed safe and effective. These measures include but are not limited to physical distancing, proper use of face masks, and vaccination. Protecting this vulnerable population from morbidity and mortality associated with a vaccine-preventable illness is important. Given the health inequities that are historically and currently experienced by marginalized and underrepresented AYA, it is also imperative that strategies address any barriers that this population faces. Cooperating with organizations that aim to increase equity, improve immunization rates, and that traditionally have strong community relationships is vital toward achieving the goals, as are health education and vaccine awareness campaigns to boost confidence in COVID-19 vaccination and diminish barriers due to medical mistrust and vaccine hesitancy.

The authors would like to note that as the landscape and information regarding COVID-19 and COVID-19 vaccines continue to shift and evolve quite rapidly, the specifics discussed above that may change (though current during the writing of this article) the general principles outlined for AYA remain relevant.

Prepared by:

Nneka Holder, M.D., M.P.H., F.S.A.H.M.
Department of Pediatrics, MedStar Georgetown University Hospital, Washington, DC

Tamera Coyne-Beasley, M.D., M.P.H., F.A.A.P., F.S.A.H.M.
Children’s of Alabama, Birmingham, Alabama

Gregory Zimet, Ph.D., F.S.A.H.M.
Indiana University School of Medicine, Division of Adolescent Medicine, Indianapolis, Indiana

Evelyn Eisenstein, M.D.
Clinica de Adolescentes, University of the State of Rio de Janeiro, Rio de Janeiro, Brasil

Rachel Skinner, M.B.B.S., Ph.D., F.R.A.C.P.
Specialty of Child and Adolescent Health, Faculty of Medicine and Health, University of Sydney, Children’s Hospital Westmead, Westmead, New South Wales, Australia

Preeti Galagali, M.D.
Bengaluru Adolescent Care and Counseling Centre, Rajajinagar, Bengaluru, Karnataka, India

Nuray Kanbur, M.D.
Division of Adolescent Health, Department of Pediatrics, University of Ottawa, Faculty of Medicine, Children’s Hospital of Eastern Ontario, Ottawa, Ontario, Canada and Division of Adolescent Medicine, Department of Pediatrics, Hacettepe University Faculty of Medicine Ankara, Turkey
References

[1] Saxena K, Marden JR, Carias C, et al. Impact of the COVID-19 pandemic on adolescent vaccinations: Projected time to reverse deficits in routine adolescent vaccination in the United States. Curr Med Res Opin. 2021;37.

[2] The World Health Organization COVID Vaccine Tracker. Available at: https://covid19.trackvaccines.org/agency/who/. Accessed January 31, 2022.

[3] Wallace M, Woodworth KR, Garçon JW, et al. The Advisory Committee on immunization practices’ Interim recommendation for Use of Pfizer-BioNTech COVID-19 vaccine in adolescents aged 12–15 Years — United States, may 2021. MMWR Morb Mortal Wkly Rep 2021;70:749–52.

[4] Thomson H. Children with long covid. New Sci 2021:249:10–1.

[5] Blomberg B, Mohin KG, Brokstad KA, Zhou F, Linchausen DW, Hansen BA, Larrey S, Onyango TB, Kuceriker K, Savvik M, Bartsch H, Tendel C, Kittang BR; Bergen COVID-19 Research Group, Cox RJ, Langeland N. Long COVID in a prospective cohort of home-isolated patients. Nat Med 2021; 27:1607–13.

[6] Singer TG, Evankovich KD, Fisher K, et al. Coronavirus infections in the Nervous system of children: A Scoping review Making the case for long-term Neurodevelopmental Surveillance. Pediatr Neurol 2021;117:47–63.

[7] Triggle CK, Bansal D, Ding H, et al. A Comprehensive review of viral Characteristics, transmission, Pathophysiology, immune response, and Management of SARS-CoV-2 and COVID-19 as a Basis for controlling the pandemic. Front Immunol 2021;12:631139.

[8] ElBagouri M, Tolba MM, Nasser HA, et al. The find of COVID-19 vaccine: Challenges and opportunities. J Infect Public Health 2021;14:389–416.

[9] Hause AM, Gee J, Baggs J, et al. COVID vaccine safety in adolescents aged 12-17 Years - United States, December 14, 2020-July 16, 2021. MMWR Morb Mortal Wkly Rep 2021;70:1053–8.

[10] Wallace M, Wimalasiri W, Haller SC, et al. Use of mRNA COVID-19 vaccine after Reports of myocarditis among vaccine Recipients: Update from the Advisory Committee on immunization practices — United States, June 2021. MMWR Morb Mortal Wkly Rep 2021;70:977–82.

[11] Woodworth KR, Moula D, Collins JP, et al. The Advisory Committee on immunization practices’ Interim recommendation for Use of Pfizer-BioNTech COVID-19 vaccine in children aged 5–11 Years — United States, November 2021. MMWR Morb Mortal Wkly Rep 2021;70:1579–83.

[12] American Academy of Pediatrics Policy Statement. Committee on infectious diseases, COVID-19 vaccines in children and adolescents. Pediatr November 2021;5:e2021054332.

[13] Spikevax and Moderna COVID-19 vaccine. U.S. Food and Drug administration. Available at: https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/spikevax-and-moderna-covid-19-vaccine. Accessed February 1, 2022.

[14] Olson SM, Newhams MM, Halasa NB, et al. mRNA vaccination against COVID-19 hospitalization among persons aged 12-18 years - United States, June-September 2021. MMWR Morb Mortal Wkly Rep 2021;70:1483–8.

[15] World Health Organization. COVID-19 advice for the public: Getting vaccinated. Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/covid-19-vaccines/advice. Accessed February 2, 2022.

[16] Centers for Disease Control and Prevention. Historical vaccine safety concerns. Available at: https://www.cdc.gov/vaccinesafety/concerns/concerns-history.html. Accessed September 18, 2021.

[17] World Health Organization COVID Vaccine Protocols. Available at: https://apps.who.int/iris/bitstream/handle/10665/345178/9789240032781-eng.pdf?sequence=1. Accessed November 19, 2021.

[18] Liu W, Russell RM, Biollaz-Ruﬁe F, et al. Predictors of Nonseroconversion after SARS-CoV-2 infection. Emerg Infect Dis 2021;27:2454–8.

[19] Harvey WT, Carabelli AM, Jackson B, et al. SARS-CoV-2 variants, spike mutations and immune escape. Nat Rev Microbiol 2021;19:409–24.

[20] Tohoyig KA, Nyberg T, Zaidi A, et al. COVID-19 Genomics UK (COG-UK) consortium. Hospital admission and emergency care attendance risk for SARS-CoV-2 delta (B.1.617.2) compared with alpha (B.1.1.7) variants of concern: A cohort study. Lancet Infect Dis 2021;22:35–42.

[21] CDC Expands booster shot Eligibility and Strengthens recommendations for 12-17 Year olds. Center for disease control and prevention. Available at: https://www.cdc.gov/media/releases/2022/s0105-Booster-Shot.html. Accessed February 2, 2022.

[22] Vasquez Reyes M. The disproportional impact of COVID-19 on African Americans. Health Hum Rights 2020;22:299–307.

[23] Kirby T. Evidence mutons on the disproportionate eect of COVID-19 on ethnic minorities. Lancet Respir Med 2020;8:547–8.

[24] Coyne-Beasley T, Hill SV, Zimet G, et al. COVID-19 vaccination of adolescents and young adults of color: Viewing acceptance and uptake with a health equity Lens. J Adolesc Health 2021;68:844–6.

[25] Mathieu E, Ritchie H, Ortiz-Ospina E, et al. A global database of COVID-19 vaccinations. Nat Hum Behav. 2021. Available at: https://ourworldindata.org/covid-vaccination-global-projections. Accessed September 18, 2021.

[26] Kitano T, Kitano M, Krueger C, et al. The differential impact of pediatric COVID-19 between high-income countries and low- and middle-income countries: A systematic review of fertility and ICU admission in children worldwide. PLoS ONE 2021;16:e0264326.

[27] Ackerson BK, Sy LS, Glenn S, et al. Pediatric vaccination during the COVID-19 pandemic. Pediatrics 2021;148:1–11.

[28] Bernstein HH, Bocchini JA Jr, Committee On Infectious Diseases. The need to expand adolescent immunization. Pediatrics 2017;139:e2016486.

[29] Vujovich-Dunn C, Skinner SR, Brotherton J, et al. School-level Variation in vaccine hesitancy: A global database of COVID-19 vaccinations. Nat Hum Behav. 2021. Available at: https://ourworldindata.org/iris/bitstream/handle/10665/345178/9789240032781-eng.pdf?sequence=1. Accessed November 19, 2021.

[30] Teens for vaccines. Available at: https://teensforvaccines.org/. Accessed October 8, 2021.

[31] Azzari C, Diez-Domingo J, Eisenstein E, et al. Experts’ opinion for improving global adolescent vaccination rates: A call to action. Eur J Pediatr 2020;179:547–53.

[32] Klein J, Litjen, Tan MS, Zimet G. Improving adolescent immunization coverage: The time to Act is Now. J Adolesc Health 2017;61:541–8.

[33] Quinn SC, Andrasik MP. Addressing vaccine hesitancy in BIPOC communities - toward Trustworthiness, partnership, and Reciprocity. N Engl J Med 2021;385:97–100.

[34] Kang M, Davies C, Skinner SR. Teens should have a say in whether they get a COVID vaccine. The Conversation. 2021. Available at: https://theconversation.com/teens-should-have-a-say-in-whether-they-get-a-covid-vaccine-164388. Accessed October 8, 2021.