



Individual Medical Emergencies Occurring at School

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Children and adults may face emergency medical situations because of injuries, complications of chronic health conditions, or unexpected major illnesses that occur in schools. The American Academy of Pediatrics published a policy statement in 2001 titled “Guidelines for Emergency Medical Care in Schools,” and in 2008, published its revision, “Medical Emergencies Occurring at School.” Those statements focused on the preparedness of schools to address individual student emergencies. The increase in the number of children with special health care needs and chronic medical conditions attending schools, together with the added challenges faced by school districts to ensure that schools have access to on-site, licensed health care professionals on an ongoing basis, have contributed to added risks that medical and nonmedical personnel face in dealing with medical emergencies in schools. This newly revised policy statement serves as an update of the statement published in 2008 and reaffirmed in 2017, and intends to increase pediatricians’ awareness of schools’ roles in preparing for individual student emergencies and provide recommendations for the medical home and school physicians on how to assist and support school personnel. This statement does not address schoolwide or communitywide emergencies that might occur as a result of natural or man-made disasters.

Rationale

Schools need to be prepared to deal with medical, behavioral, and traumatic emergencies that students or staff may experience. It is estimated that 10% to 25% of childhood injuries occur while the child is in school.¹ In addition, the steady increase in the number of children with special health care needs attending mainstream schools means that there now exists a pool of students with a broad range of medical conditions that may require special equipment, preparation, and training of personnel; medications and supplies; and/or transport

abstract

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decisions and arrangements in the event of an emergency because of exacerbation of chronic conditions. Although unintentional injuries are harder to prepare for, it is prudent for schools to prepare particularly for potential medical emergencies related to chronic conditions, such as seizures, diabetes, allergies/anaphylaxis, mental illness, substance use, or asthma, through personnel training and emergency action plans. Such preparation may be challenging because a large proportion of schools lack qualified, on-site, licensed health care professionals to respond to individual student medical emergencies. This policy statement highlights the role of school personnel, the school health and safety team (school nurse, counselor, social worker, school resource/law enforcement officer), school physician, primary care/medical home, and specialty physicians in each step of the process of managing individual student emergencies occurring in school. There is a fundamental link between emergency readiness and disaster preparedness. Schools that are prepared for an emergency in an individual are possibly more likely to be prepared for complex events such as community disasters. For schoolwide or communitywide natural or man-made disasters, the American Academy of Pediatrics (AAP) offers policies, strategies, and resources on its Children and Disasters Web site (www.aap.org/disasters). For more details on the role of schools and school physicians in preparing for individual student or community emergencies, the reader may consult the 7th edition of the AAP publication *School Health: Policy and Practice* (2016).²

Background

School-aged children, on average, spend 28% of their day and 14% of their total annual hours in school.¹

There are 74.3 million children younger than 18 years of age living in the United States (according to the 2017 United States Census: <https://www.census.gov/>). The Maternal and Child Health Bureau of the United States Department of Health and Human Services estimates that, of this group, 14.6 million children and adolescents (20%) have special health care needs or a chronic illness (<https://mchb.hrsa.gov/maternal-child-health-topics/children-and-youth-special-health-needs>). Despite its critical importance, school emergency medical preparedness is frequently inadequate because of barriers such as geographic and physical facility conditions, staffing, staff education and training, and financial resources.

Schools across the nation vary tremendously in their degree of preparedness to deal with emergencies. Even within the same school, disparities still exist. For instance, Gupta et al³ found, on the basis of a survey of Chicago public schools, a variability between schools regarding when and for which students and clinical conditions an emergency plan is available. An emergency plan is more likely to be on file for students who have both asthma and food allergy (odds ratio, 4.1; 95% confidence interval CI, 3.7–4.6; $P < .001$) than for students who had either diagnosis alone (24% of students with asthma and 51% of students with food allergy had a plan). Students of Black or Hispanic ethnicity or from low-income families were less likely to have management plans in their schools.³ A school having policies or guidelines for food allergies was found to be associated with 3.5 times greater likelihood that the school required individual student food allergy action plans than schools with no guidelines or policies (odds ratio, 3.5; 95%

confidence interval, 1.00–12.2; $P = .05$).⁴

Another critical factor in the preparedness of schools for emergencies is medical and nonmedical staff, as well as students' training. School medical emergencies can involve students, adults, staff members, or attendees of special events. Because unintentional injuries are the leading cause of death⁵ encountered in children and adolescents inside or outside schools, teachers, school nurses, physicians, athletic trainers, coaches, and students should know general principles of first aid and cardiopulmonary resuscitation (CPR). In all 50 states and the District of Columbia, Good Samaritan legislation provides protection for lay rescuers in cases of emergency. The AAP technical report "Advocating for Life-Support Training of Children, Parents, Caregivers, School Personnel, and the Public" notes that pediatricians are uniquely positioned to strongly encourage training in basic life support skills, including the use of automated external defibrillators and naloxone, for children and school personnel.⁶

The goals of this statement are to:

- Increase the pediatric clinician's awareness of the role schools play in preparing for and responding to individual student emergencies.
- Serve as a tool that pediatricians can share with their schools and school systems to provide detailed guidance and/or advocate for more resources.

Recommendations and resources are provided to assist primary care clinicians and school physicians in supporting schools in this role. Resources, linkages with emergency medical services (EMS), and staff training are all vital to emergency

medical preparedness. It is really the scale and terminology that distinguish the response to an individual emergency from the response to a disaster. The terminology of mitigation and prevention, preparedness, response, and recovery⁷ is generally not used for individual emergencies but reserved for large-scale disasters. In individual emergencies, the emphasis is less on prevention and more on preparedness and response. The following reflects the role schools play in these aspects of individual emergency response.

DESCRIPTION OF THE SCHOOL ROLE

Readiness for Response

Any child can have a medical emergency in school. Children with special health care needs carry additional risks of emergencies related to their diagnoses. In addition, adults who are present on school grounds during the school day, as well as after-school events, can experience medical emergencies. From injury to anaphylaxis to status epilepticus, schools are expected to anticipate and prepare to respond to a wide variety of emergencies in both children and adults.^{2,8}

General Preparation

Ideally, schools develop emergency policies with input from the medical community, both EMS personnel and community clinicians. These policies need to be flexible enough to accommodate different students' developmental levels. Integration of EMS personnel into school emergency planning familiarizes them with the location and type of medical resources available at the school. This collaboration leads to the creation of policies and regulations that appropriately delegate authority, assign roles, distribute shared resources, and establish parameters for health care providers. In addition to the

recommendations specified in this AAP policy statement, the American Heart Association (2015) published guidelines⁹ recommending that school leaders establish emergency response plans to deal with individual student emergencies. The range of recommended policies can vary from general emergency management, to use of CPR and automated external defibrillators (AEDs), to the use of naloxone and rectal valium, to life-threatening allergy management. These policies are discussed briefly below.

- Policies, regulations, and protocols are created to cover all aspects of school jurisdiction, from classroom to playground, school-based health centers (if 1 is available), before- and after-school programs, field trips, transportation, and athletic events. These are to be clearly stated and communicated to all school staff and parents. Table 1 provides some resources for the creation of such policies.
- Emergency information is to be collected on all children and includes parental contact, health care provider contact, medical conditions, medications, allergies, and insurance. Computer technology could facilitate the collection, storing, and transfer of this information.
- It is ideal that protocols include algorithms for determining levels of emergencies. Minor illnesses or injuries are to be distinguished from emergencies requiring EMS activation.
- Each school should have an efficient and effective campuswide communication system with local EMS.¹⁰ It is important that the EMS activation process is clear to all staff. In the event of a medical emergency within school jurisdiction, the emergency response includes school nurses and school staff, who will interact with EMS personnel when the emergency warrants activating the 911 system. Ongoing communication, review, drills, and practice of procedures ensure achievement of this level of integration. The drills should preferably include school personnel (school nurses, physicians, and athletic trainers where available) and the EMS system.¹⁰
- Participation of physical facilities administrators in the planning ensures that the most efficient access routes to the school, as well as floor plans, are available to EMS.
- Clarity of school staff roles in an emergency is essential for smooth response. Ideally, the school nurse in each building should be the key person to develop and implement the emergency plan because the nurse is the staff member who is most skilled and familiar with individual students' health issues and community resources. In the absence of a school nurse, members of the school health and safety team (social worker, counselor, school resource/law enforcement officer) are designated, trained, and empowered to make decisions concerning health emergencies. Names, telephone numbers, and locations of these designated and trained school personnel are to be provided to all staff members. The school health services director (or equivalent), with support from the district school health advisory council and/or school board, is responsible for implementing the necessary initial and refresher trainings of school staff, assessing competency, and ensuring that school districts budget for adequate resources.
- The development of campuswide communication strategies (2-way radios, pagers, cell phones) is key so that staff members are

TABLE 1 Selected Emergency Preparedness Resources and Links

Resources and Links	
General Resources	
AAP Council on School Health	<a href="https://www.aap.org/en/community/aap-councils/council-on-school-health/School Health: Policy and Practice, 7<sup>th</sup> edition (2016)">https://www.aap.org/en/community/aap-councils/council-on-school-health/School Health: Policy and Practice, 7th edition (2016)
School emergency response plan, American Heart Association	“Response to Cardiac Arrest and Selected Life-Threatening Medical Emergencies: The Medical Emergency Response Plan for Schools” http://cpr.heart.org/AHA/ECC/CPRAandECC/Programs/CPRInSchools/UCM_477994_Cardiac-Emergency-Response-Plan.jsp
National Association of School Nurses	http://www.nasn.org/
American Heart Association	http://www.americanheart.org
Emergency Medical Services for Children National Resource Center	https://emscimprovement.center
Protecting children with disabilities (504 Plans), US Department of Education	https://www2.ed.gov/about/offices/list/ocr/504faq.html#evaluation https://www.understood.org/en/school-learning/special-services/504-plan/sample-504-plan
The difference between IEPs and 504 Plans	https://www.understood.org/en/school-learning/special-services/504-plan/the-difference-between-ieps-and-504-plans
Food Allergy and Anaphylaxis Network	http://www.foodallergy.org/
National Asthma Education and Prevention Program, American Diabetes Association, American School Health Association, Epilepsy Foundation, The Food Allergy and Anaphylaxis Network, National School Boards Association	“Students with Chronic Illnesses: Guidance for Families, Schools and Students” https://www.nlm.nih.gov/files/docs/public/lung/guidfam.pdf
Asthma	
General information	Lung diseases information https://www.nlm.nih.gov/science/lung-diseases “Is the Asthma Action Plan Working? A Tool for School Nurse Assessment” https://www.nlm.nih.gov/health-topics/all-publications-and-resources/asthma-action-plan-working-tool-school-nurse “Managing Asthma in the School Environment” https://www.epa.gov/iaq-schools/managing-asthma-school-environment “Managing Asthma – A Guide for Schools” https://www.nlm.nih.gov/health-topics/all-publications-and-resources/managing-asthma-guide-schools-2014-edition “Suggested Emergency Protocol for Students with Asthma Symptoms” https://www.nlm.nih.gov/files/docs/resources/lung/sch-emer-actplan.pdf “When Should Students with Asthma or Allergies Carry and Self-Administer Emergency Medications at School?” https://www.nlm.nih.gov/files/docs/resources/lung/emer_med.pdf
Head injuries	https://www.cdc.gov/traumaticbraininjury/PediatricTBIGuideline.html
Concussion: CDC Heads Up	https://www.cdc.gov/HeadsUp/
Trauma/bleeding emergency: Stop the Bleed	https://www.dhs.gov/stopthebleed
Disease-specific action plans	
CERP	https://cpr.heart.org/en/training-programs/nation-of-heartsavers/cardiac-emergency-response-plan
Asthma action plans	Agency for Healthcare Research and Quality: quality tools https://www.ahrq.gov/professionals/quality-patient-safety/quality-resources/index.html NHLBI asthma patient action plan https://www.nlm.nih.gov/files/docs/public/lung/asthma_actplan.pdf
Diabetes action plans	ADA diabetes care plans https://www.diabetes.org/resources/know-your-rights/safe-at-school-state-laws/written-care-plans Sample emergency action plan https://www.nebo.edu/pubpolicy/J/JHCD-F4.pdf 504 Plans for students with diabetes https://childrenwithdiabetes.com/diabetes-and-school/504-plans-for-students-with-diabetes/
National Diabetes Education Program	https://www.niddk.nih.gov/health-information/communication-programs/ndep/health-professionals/helping-student-diabetes-succeed-guide-school-personnel
“Helping the Student with Diabetes Succeed: A Guide for School Personnel”	
Seizures emergency action plan	Epilepsy Foundation: seizure action plan https://www.epilepsy.com/learn/managing-your-epilepsy/seizure-action-plans
Allergy action plan	NASN allergies and anaphylaxis resources https://www.nasn.org/nasn-resources/resources-by-topic/allergies-anaphylaxis

TABLE 1 Continued

Resources and Links	
Food Allergy Action Plan https://www.foodallergy.org/life-with-foodallergies/food-allergy-anaphylaxis-emergency-care-plan	Food allergy guidelines for schools http://www.cdc.gov/healthyyouth/foodallergies/
Congenital adrenal hyperplasia CARES Foundation, getting ready for school/camp	https://www.caresfoundation.org/wp-content/uploads/2016/07/Getting-Ready-for-School-UPDATED-packet-new-logo-7.28.16.pdf
Adrenal insufficiency Adrenal insufficiency, United School Resources Children with special health care needs emergency information form	https://aiunited.org/school-resources/ "Emergency Preparedness for Children with Special Health Care Needs" http://pediatrics.aappublications.org/content/125/4/829
National Association of School Nurses	"Emergency Preparedness and Response in the School Setting: The Role of the School Nurse" https://www.nasn.org/advocacy/professional-practice-documents/position-statements/ps-emergency-preparedness "Individualized Health Care Plans: The Role of the School Nurse" https://www.nasn.org/advocacy/professional-practice-documents/position-statements/ps-ihps
Mental health "National Athletic Trainers' Association, Emergency Action Plan Guidelines: Mental Health Emergency in Secondary School Athletes"	https://www.nata.org/sites/default/files/mental_health_eap_guidelines.pdf
CPR in schools	www.heart.org/cprinschools
Infectious diseases "Managing Infectious Diseases in Child Care and Schools: A Quick Reference Guide"	https://shop.aap.org/managing-infectious-diseases-in-child-care-and-schools-5th-ed-paperback/ And/or: https://shop.aap.org/managing-infectious-diseases-in-child-care-and-school-ebook-ebook/
AAP Red Book Online	https://redbook.solutions.aap.org/redbook.aspx
AAP COVID-19 resources	https://services.aap.org/en/pages/2019-novel-coronavirus-covid-19-infections/clinical-guidance/
Best practices on athletic emergencies occurring at high schools	"The Inter-Association Task Force for Preventing Sudden Death in Secondary School Athletics Programs: Best-Practices Recommendations" https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3718357/

ADA, Americans With Disabilities Act; COVID-19, coronavirus disease 2019; NASN, National Association of School Nurses; NHLBI, National Heart, Lung, and Blood Institute.

- accurately informed and rumors are minimized. This is especially important in the event of an incident involving violence.
- Schools can determine whether using trained students in an emergency situation is feasible within the constraints of confidentiality. These students may maximize limited resources by being runners, mobilizing equipment, helping in evacuations, or providing escorts to response agencies not familiar with school grounds. It is important to define their role ahead of time, guarantee adequate training, include them in the plan, and practice executing the plan.
 - Periodic drills with local EMS and hospital emergency departments are essential components of preparedness. This allows schools to better understand their barriers to good EMS care and, in turn, EMS professionals get a preemergency look at school operations and physical structure, allowing problem solving to begin before any emergency or crisis.¹¹
 - The availability of sufficient supplies to address an individual emergency is of utmost importance. A complete emergency medical kit that is secure, carefully organized, and monitored by protocol should be accessible for use by authorized and trained school staff members who have volunteered to serve in an emergency.^{12,13} In 2003, a national consensus group that included the AAP was convened by the Emergency Medical Services for Children National Resource Center and the National Association of School Nurses and published a report titled "Recommended Minimal Emergency Equipment and Resources for School: A National Consensus Group Report."¹⁴ This report lists the minimal emergency equipment needed by a school with a nurse on-site and a separate list for the school with no nurse on-site. This resource is a

valuable reference for putting together an emergency medical kit. Someone should be assigned to check expiration dates at regular intervals to ensure supplies are up to date.

- All equipment is maintained and inspected at appropriate intervals. If an AED is available on-site, knowing its location should be part of the drill. In addition, an AED maintenance, testing, and repair program must be incorporated into the AED emergency response protocol.¹⁵
- Staff development and training are essential to responding to a medical emergency. Human resources policies and regulations may determine to what extent and capacity staff may respond to an emergency. However, there are certain basic skills in which all staff members can become proficient.
 - It is important that universal precautions are discussed at the beginning of each year with the entire staff.
 - Basic response to emergency situations is to be discussed with the entire staff. This includes responses to large-scale emergencies, as well as to minor problems. Because parents have the right to limit medical information given to schools, it is prudent to give general response guidelines to seizures, fainting, bleeding, anaphylaxis, choking, hypoglycemia, and head trauma so that staff members can become more comfortable with initiating an emergency response even if they are not aware the child has a medical concern.
 - Some staff members may opt for more in-depth training, and it is recommended that at least 1 staff member (more are better to account for employee absences and dual

assignments), in addition to the school nurse, have CPR and first-aid training.¹⁵ The larger number of staff trained in CPR and first aid, the more effective the emergency response and preparedness.

- Schools determine whether a school staff member accompanies the student to the hospital. If a staff member is to accompany the student, it is important to remember that the staff member's role is to support the child rather than serve as a source of consent to medical treatment. The school is advised to develop such a policy to clarify the staff role, because states permit emergency medical treatment in the absence of parental consent. It is preferable that multiple backup numbers of emergency contacts are available for each student's family.

Preparation for Children With Special Health Care Needs

- Individualized health plan (IHP): Students and staff members with chronic medical conditions or other special health care needs are more susceptible to medical emergencies and require schools to have a heightened sense of readiness. Students should have an updated IHP prepared by the school nurse with input from the family and the primary care clinician/medical home. The IHP contains information on medications, activity levels, dietary needs, equipment, transportation, and other accommodations. Using this information, the school can then plan for accommodations to daily classroom activity, field trips, and emergency needs of the student.
- Emergency care plans (ECPs): Schools should identify students at risk for life-threatening emergencies and ensure the presence

of individual ECPs for each one of these students.⁸ ECPs, developed from information in the IHP, are to be copied and made available for transport with the child if he or she requires hospital treatment and/or management in the event of a communitywide disaster.

- The IHP and/or the ECPs can serve as a resource to assist school teams in developing individualized education programs (IEPs) or 504 Plans. The IEP is a blueprint that provides individualized special education and related services to meet the child's unique needs. A 504 Plan is an agreement between a student's legal guardian and a school district that the student will have full access to all school activities, receive necessary accommodations to the learning environment to ensure their academic success, and will have their medical needs met. Both the 504 Plan and the IEP are formal, legal documents, which means that the school is legally bound to implement their elements (unlike IHPs and ECPs, which are meant to provide recommendations and guidance for care plans).
- The emergency information form (EIF): The EIF, developed by AAP and the American College of Emergency Physicians, is another useful summary form. It is typically a 1-page medical summary completed by the medical home of patients with special health care needs in consultation with the child's specialists. The EIF should be updated at least annually. It allows care providers in various settings (emergency department, hospitals, schools) to be informed of the patient's complex medical needs, diagnoses, medications, specialists and providers, and follow-ups. This information is very valuable for routine care and during

emergencies or disasters.¹⁶ In addition, the EIF is useful in developing both an IHP and an ECP,¹⁴ and can be a useful and even life-saving resource in the school setting. Hence, the medical home should encourage parents/guardians/families to always carry the EIF with them and to share the EIF with the school nurse/teachers for use in developing IEPs and 504 Plans and for better outcomes in the event of an emergency at school.¹⁶

- The IHP and EIF inform school personnel of technology and equipment particular to each child, such as tracheostomies, feeding tubes, vagal nerve stimulators, and other indwelling devices such as insulin pumps and continuous glucose monitors. Families and primary and specialty care providers are encouraged to work with school health personnel to familiarize school staff with the technologies and to determine what maintenance or management can be performed by school staff.
- Any equipment or medication required for emergency management of a student or staff member (eg, evacuation chair, epinephrine auto-injector, glucagon kit, or stress dose steroid kit) is to be easily accessible.
- Staff caring for students with special needs should have an awareness of the illnesses and be trained to respond to emergencies (eg, seizures, asthma, diabetic ketoacidosis, serious hypoglycemia, adrenal crisis, and sickle cell disease) until a health care professional arrives. This capacity is especially important in the event of a community disaster in which the EMS prehospital emergency response system may not be readily available.
- As stated previously, some parents may opt not to disclose a child's disability to teachers

because of concerns about stigmatization. Therefore, basic awareness training to all staff at the beginning of the year is a prudent approach.

Policies and Procedures for Specific Emergencies

Allergy/Anaphylaxis

- The most common trigger for allergic reactions and anaphylaxis is food,¹⁷ affecting 11 million Americans.¹⁸
- An epidemiologic study by Gupta et al estimates that 1 in 13 children have food allergies.¹⁹ The Centers for Disease Control and Prevention (CDC) estimates that 1 in 25 school-aged children have food allergies,⁴ with up to 18% to 25% of these children having their first food allergic reaction at school.^{20,21} Overall, ~84% of these children will have a reaction at school at some point in time.¹⁸ Although the majority of allergic reactions that occur in schools are not anaphylaxis and rarely lead to death, delays in recognition and appropriate treatment of real anaphylactic shock accounts for fatal outcomes that are highly preventable. It is worth noting that 25% of anaphylactic shock cases in schools occur in students without a previous diagnosis.²²⁻²⁵ Therefore, it is important that school personnel be trained on identification of anaphylaxis in individuals with known history and in first-time anaphylaxis.
- On November 13, 2013, the School Access to Emergency Epinephrine Act was signed into law and has provided incentive to states that mandated stocking nonstudent-specific epinephrine in schools. The act encourages (but does not mandate) having trained personnel administer epinephrine when needed in school.

Consequently, it is common to see schools in almost every state have school epinephrine laws or regulations, but most have no clear implementation guidelines or direction to school nurses for comprehensive epinephrine programs in their schools.^{17,26} The National Association of School Nurses fills this guidance gap in its position statement titled "Allergy/Anaphylaxis Management in the School Setting."²⁷ The statement recommends that school nurses are uniquely positioned to develop and implement IHPs for students with allergies, coordinate resources, and provide allergy and anaphylaxis education and training to foster a safe school environment for all students.¹⁷

- School policies must cover epinephrine auto-injector stocking, disposal, and replacement procedures. The stocked epinephrine is typically prescribed by the school medical advisor (eg, school physician) because it is not designated for a particular student.
- Policies in schools should address who must receive education and training, who must be trained to administer epinephrine, and who must document and report events per state-specific requirements. The CDC recommended in 2013 that the school nurse should train all school personnel in recognizing the signs and symptoms of possible anaphylaxis and initiating the emergency protocol. Both the CDC and the National School Boards Association recommend that students and parents receive anaphylaxis education.^{17,26}
- It is very important that schools have policies, procedures, and protocols to address the response to such incidents. School procedures must comply with state and local regulations for

administration of epinephrine auto-injectors by nonlicensed personnel. Parents of children known to have life-threatening food allergies should inform the school of the child's allergy history and provide the school with a copy of a written anaphylaxis action plan prepared by the child's primary care clinician. The action plan might include recommendation for self-injectable epinephrine (depending on the child's age) for use in the school in addition to the 1 provided at home. The AAP Allergy and Anaphylaxis Emergency Plan is available in the clinical report "Guidance on Completing a Written Allergy and Anaphylaxis Emergency Plan."²⁸

- For recommendations on managing food allergies in the school setting, refer to the AAP clinical report "Management of Food Allergy in the School Setting" at <http://pediatrics.aappublications.org/content/126/6/1232>.

Asthma

Asthma is the leading cause of chronic illness in children and adolescents in the United States, affecting 10% of all school-aged children, particularly low-income and inner-city children.^{2,29} Poorly controlled asthma leads to school absenteeism (average of 10.5 million yearly missed school days), classroom disruption, and poor athletic performance.² Asthma emergencies may occur in school and on the playground during sporting events. Schools should be prepared to deal with these emergencies through policies, equipment, staff education, and training.

General asthma school emergency preparedness should include^{2,30}:

- Having the right equipment on campus, such as nebulizers,

spacer devices, peak flow meters, self-injectable epinephrine, and oxygen.

- Maintaining a general emergency plan for dealing with respiratory emergencies. The plan must delineate personnel roles such as who stays with student, who calls 911, and who contacts the parent.
- Education and training of key school personnel, including teachers and coaches, about recognition of signs and symptoms of asthma exacerbations and triggers, and being aware of the existence of an asthma action plan for each student.
- Providing a school environment free of asthma-triggering substances.

Specific emergency preparedness for students known with asthma should include:

- Requesting that parents or guardians send to school a student-specific written asthma action plan prepared by a physician or a licensed health care provider. The plan, signed by a parent and the physician, is kept on file at school and renewed yearly. It includes medications, triggers, daily management, and emergency steps and phone numbers. Table 1 provides resources for guidance.

The school nurse plays a key role in emergency preparedness efforts through³⁰:

- Identifying asthmatic students from health records and ensuring they all have a student-specific, updated, easily accessible asthma action plan on file.
- Having an emergency backup plan for times when the nurse is not immediately available.
- Overseeing the training of personnel and coaches on asthma

signs and triggers and arranging for medication administration in accordance with school policy and state mandates, including access to emergency medications and supporting self-administration when appropriate.

- Communication with parents or guardians and health care providers when an acute episode or change in health status occur, including suspected asthma in an undiagnosed student.

Sudden Cardiac Arrest

- According to the National Collegiate Athletic Association, there are nearly 8 million high school athletes in the United States. Athlete sudden death is fortunately rare. However, sudden cardiac deaths in adult spectators have been reported, and schools need to prepare for them, as well.
- In the United States, athletic death rates are highest among high school athletes. Sudden cardiac arrest leads the causes of high school athletic deaths, along with head and neck injuries and exertional heat stroke.^{31,32} According to the National Collegiate Athletic Association's reporting system, sudden cardiac arrest occurs in young athletes at a reported rate of 0.24 to 9.80 per 100 000 per year, and 88% of cases are in male athletes.³³ The overall incidence of sudden cardiac death is 2.28 per 100 000,³⁴ and 88% of cases are exertional.³³ Sudden cardiac death represents 75% of sudden deaths in young athletes and 5% to 10% of all deaths in children aged 5 to 19 years.^{34,35} Many of such catastrophic events can be prevented through prompt identification and treatment through CPR and early defibrillation.^{31,32}
- Despite the fact that early and effective CPR is known to be key to survival after an out-of-hospital

cardiac arrest and that bystander CPR training is the strongest predictor of a victim receiving CPR, only <3% of the US population receives CPR training annually. As a result, the National Academy of Medicine recommends CPR training as a requirement for middle school graduation. All 50 states and the District of Columbia have implemented legislation promoting lay rescuer programs and providing Good Samaritan protection for lay rescuers.^{6,36,37}

- Although early defibrillation (within 3–5 minutes of collapse) is well known to potentially result in 50% to 70% survival rates,^{36,37} less than half of states mandate placing AEDs in public schools and only a few states mandate AEDs in all their schools (Oregon and New Jersey) or have state funding for these programs (Oregon, Alabama, Rhode Island, and Texas).⁶ A recent survey of United States high schools showed that 83% of schools had at least 1 AED, with an average of 2.8 AEDs per school.³⁵ A review of a database of state statutes performed in February 2016 demonstrated that 17 states (34%) had some legislation that required AED installation in schools, but 1 state only required installation in colleges, and another 3 states only required installation in schools that participate in interscholastic athletic programs, which accounted for only 17% to 28% of public schools.³⁸ More advocacy is needed to fund AED programs.⁶
- In 2013, the Inter-Association Task Force for Preventing Sudden Death in Secondary School Athletics Programs published best practices and recommendations for the most common athletic emergencies occurring in the high school setting.^{31,32,37}
- A comprehensive cardiac emergency response plan (CERP)

should be implemented by all schools. The plan should include CPR training and placement of AEDs in schools. The American Heart Association recommends the adoption of CERPs in schools. The evidence-based core elements of CERPs are listed in Table 2.³⁵ The reality is that schools face multiple barriers to developing such programs, including funding, concerns about liability, misperceptions of need, and disparities in health care access.^{36,39}

Diabetes Mellitus

- Diabetes mellitus is one of the leading causes of chronic disease of childhood. Diabetes affects 215 000 individuals aged <20 years in the United States, and most of them spend long hours at school.^{40,41} Therefore, school staff is encouraged to be knowledgeable about diabetes and how to manage diabetes emergencies.
- Schools that receive federal funding (irrespective if public, private charter, or parochial and postsecondary institutions) are required to provide reasonable accommodations to meet the special needs of students with diabetes during both school days and after-school activities. Accommodations should be developed in communication with the student's health care provider and the parent/guardian. They must be documented in a written individualized diabetes medical management plan under the Section 504 Plan or IEP federal law.^{40,41} Table 3 lists the elements for which a diabetes medical management plan should provide specific instructions.⁴¹

Mental Health Emergencies

- Most schools may provide students with mental and behavioral health counseling services for known and existing problems

such as depression, anxiety, and aggression. Protocols for the emergency management of acute flare-ups of violent, homicidal, and suicidal behaviors and severe depression must exist in schools. This management typically involves crisis intervention and EMS activation, with the goal to stabilize the individual student and/or transport the student to an emergency department for further management and/or hospitalization depending on state laws.²

Substance Use and Overdose

- According to the 2018 Substance Abuse and Mental Health Services Administration's National Survey on Drug Use and Health, 1.7 million adolescents aged 12 to 20 years were current illicit drug users.⁴² The "Monitoring the Future Survey: High School and Youth Trends 2019" reports that 2.7% of 12th graders admitted to misusing a prescription opioid in 2019. The level of misuse in 2019 was the lowest since it was first tracked by the survey.⁴³ The administration of naloxone hydrochloride in cases of intentional and unintentional drug overdoses can be life-saving.
- A survey of a convenience sample of school nurses from North Carolina and South Carolina reported that although 40% of responding school nurses had encountered a student with an opioid prescription, only 3.6% had naloxone available in the event of an overdose. More than 80% of the surveyed school nurses were interested in opioid-related training.⁴⁴
- The school emergency preparedness toolkit and response plan may include the safe and effective management of opioid pain reliever-related overdose and the use of naloxone. If included, the

TABLE 2 American Heart Association Cardiac Emergency Response Plan (CERP) Core Elements³⁶

Establishing a CERP
Activating the team in response to an SCA
Implementing AED placement and routine maintenance within the school (similar to fire extinguisher protocols)
Disseminating the plan throughout the school campus
Maintaining ongoing staff training in CPR/AED use
Practicing using drills (akin to fire and lockdown drills)
Integrating local EMS with the plan
Ongoing and annual review and evaluation of the plan

SCA, student cardiac arrest.

TABLE 3 Diabetes Medical Management Plan (DMMP) Specific Elements⁴¹

Blood glucose monitoring
Insulin administration (if necessary)
Meals and snacks, including food content, amounts, and timing
Symptoms and treatment of hypoglycemia
Symptoms and treatment of hyperglycemia
Checking for ketones and appropriate actions
Participation in physical activity
Emergency evacuation/school lockdown

plan should specify the role of the school nurse, who must be familiar with state-specific legal issues and local policies related to the availability and facilitation of access to naloxone at school in the emergency response to opioid overdose in the school setting.^{45,46}

- School personnel who may respond to a suspected opioid overdose would be best prepared if trained to follow the following recommended 5-step process⁴⁶:
 - Look for the presence of signs of opioid overdose (unconscious and unarousable, shallow or no breathing, pale, clammy skin, slow or no heart beat).
 - Activate EMS.
 - If the patient is not breathing, give rescue breath, and provide CPR if no pulse.
 - Administer naloxone.
 - Do not leave the patient unattended and monitor the patient's response until EMS arrives. If patient is not awakening or breathing adequately, repeat naloxone dose after 5 minutes. If sedation and respiratory

depression recur, a repeat naloxone dose may be needed 30 to 90 minutes later.⁴⁷ Once EMS arrives, the patient should be transported to an emergency-receiving facility, even if waking up since sedation and respiratory depression may recur.

Communicable Diseases

- Communicable-disease emergencies involve exposures for which there need to be contact tracing and management. Protocols for varicella, pertussis, measles, methicillin-resistant *Staphylococcus aureus*, tuberculosis, and meningococcal meningitis exposures are developed in conjunction with local health departments. State and local health departments may serve as a valuable source for data on infectious exposures and community outbreaks. For managing exposure to other infectious diseases, such as influenza, the school should follow local school district protocols and/or consult the CDC and the AAP *Red Book*.⁴⁸

Head Injuries

- Head injuries, minor and severe, can occur during the course of athletic activity, physical altercations, or by accident. Schools should have emergency action plans for dealing with head trauma and concussions in athletes, as well as all other students. Action plans must be specific to the school and venue and should be rehearsed annually by coaches and staff.
- All stakeholders, including coaches, school staff, and health professionals, must receive education about concussion recognition and management. Recent guidelines from the CDC include recommendations for the use of symptom scales for diagnosis, assessment of risk factors for prolonged recovery, and a customized approach to returning to activities.⁴⁹ In addition, resources for health care providers, patients, and families are included on the following CDC Web site: <https://www.cdc.gov/traumaticbraininjury/PediatricTBIGuideline.html>. Concussions may be underreported by athletes for fear of exclusion from sports. It is advisable for schools to have a trained medical professional on-site during major organized sporting competitions. Currently, the law in all 50 states and the District of Columbia requires a medical evaluation by a trained health professional after a sport-related concussion, no return to play in the same day, and medical clearance before allowing return to play.⁵⁰ The AAP clinical report, "Sport-Related Concussion in Children and Adolescents," provides education on sport-related concussion diagnosis and management.⁵¹

Seizures

- The challenge in managing emergencies such as seizures in school is the reality that school nurses are not routinely available in every school. This situation necessitates the training of unlicensed assistive personnel to follow the student's ECP, administer rescue medication when needed as ordered by a health professional, and monitor for rescue medication adverse effects until medical help arrives. For details on managing epilepsy in the school setting, refer to the AAP clinical report, "Rescue Medicine for Epilepsy in Education Settings."⁵²
- Evidence of the benefit to training nonmedical school personnel was reported in a study of preschool teachers. After training on seizure management, the teachers' level of self-confidence relating to medication administration was improved and they committed fewer errors during simulation exercises.⁵³

Other Specific Emergencies

- Protocols for responding to specific emergencies (eg, seizures, choking, lacerations) are helpful to school nurse or designated staff.

Table 1 lists resources that can be helpful for schools to develop disease-specific emergency action plans.

Response

Once policies and procedures are in place, the response follows the plan in an organized and efficient manner.

- A staff member, ideally the school nurse, assesses the situation and activates the appropriate protocol(s) and determines whether EMS needs to be activated.
- When EMS is activated, there is communication of school entry points to EMS providers and a

designated greeter to direct EMS providers to the emergency.

- When possible, other students and staff members are removed from the scene.
- All emergency response interventions are promptly and accurately recorded and passed on to EMS providers.
- For children with special health care needs, the ECP is activated and information is prepared for EMS providers.
- Any student who receives emergency epinephrine is transported to the emergency department, as recommended by the American Academy of Asthma, Allergy and Immunology.^{8,25}
- Parents, legal guardians, or designated emergency contact persons are informed as quickly as possible about the child's injury or sudden illness at school after an emergency response and about actions taken to care for the child.^{12,13} In addition, notification systems are in place through a designated spokesperson to inform the school staff, students, the media, and the community at large of the outcome of an individual student's emergency situation in an appropriate manner that respects the student's confidentiality and dispels false rumors.
- The description and disposition of significant illnesses or injuries (including the illnesses or injuries for which a student, staff member, or visitor is released from school to visit a physician or hospital) are recorded on an illness and injury form. This information is also used to:
 1. identify patterns of injury;
 2. prevent another such injury or illness;
 3. inform parents of the nature and management of the injury;
 4. share information with the child's primary care provider (ie, medical home), pediatric

specialists, local and state child fatality review teams charged with investigating death and near-death events, and/or with EMS personnel; and

5. provide information for liability and insurance purposes.^{12,13}

After the Event (Review and Debrief)

- The records developed are studied to provide feedback to staff, to identify areas in need of improvement, and to design education programs.
- After an emergency intervention, the ECP is reviewed and adjusted as needed.
- Mental health interventions, as appropriate, are planned for all affected school personnel and students in collaboration with the families to facilitate smooth return to school routines. This includes addressing media and social media aspects of the individual student emergency.
- Necessary equipment and medications are restocked.

FACTORS THAT AFFECT SCHOOL EMERGENCY PREPARATION

School administration preparedness for individual student medical emergencies must recognize and address:

1. Barriers to implementation: Limited funding resources often plague public school districts, and implementation of the recommendations in this policy statement will require commitment of significant financial resources by the school district. Costs for equipment and stock medications, staff training, and school physician support must be assured in the school budgeting process in order that each school setting can be prepared to respond to medical emergencies occurring at school. The school health officer must

interact on a regular basis with school district administration to make sure that funding remains available on an ongoing basis.

2. System factors, such as school district size, student-to-school nurse ratio, students' ages/grade levels, the complexity of student medical needs, prehospital level of training of school personnel, local emergency department capability, local readily available medical treatment facilities, and human and financial resources.
3. Process factors, such as protocols and procedures, continuous training and evaluation, and collaboration among the medical and educational homes and community services, such as EMS, clinical and mental health support, and follow-up services.

Emergencies that occur in school can be either anticipated risks related to an individual student's medical condition or unanticipated events that occur in an otherwise healthy student or a staff member. The following recommendations are meant to assist primary care clinicians and school physicians in providing support to schools in their efforts to prepare for the individual student medical emergency.

RECOMMENDATIONS FOR PRIMARY CARE CLINICIANS

The medical home plays a key role in helping schools prepare for the individual student emergency. The following are key recommendations for primary care clinicians:

- **Communication:** Maintain a strong, open, and ongoing line of communication with the school nurse or designated trained school personnel and/or the school physician (when available) regarding the individual student's medical condition and current management

in coordination with the parent/caregiver. This linkage informs the school nurse on any changes or updates to the student's IHP, ECP, 504 Plan, or IEP when applicable. The EIF (developed by the American College of Emergency Physicians and AAP [<http://pediatrics.aappublications.org/content/125/4/829>]) is one such tool that can be completed by the primary care clinician and may be used to communicate with the school nurse.¹⁵ Table 1 provides selected resources for general and disease-specific emergency care, action, and health plans that can be used by the primary care clinician in communication with the school nurse after obtaining parental permission. The school nurse plays an important role in developing and implementing health plans, activating physicians' orders, and interpreting physicians' instructions for staff, for students, and in plain and preferred language for families.

- **Familiarity:** Strive to support the development of individual patient emergency plan in the context of the patient's school, the school resources, and staffing, and advise on issues that might affect the student's disease management and outcome.
- **Parent engagement:** Advise parents to become familiar with the school's emergency plan and help them evaluate how the plans meet the needs of their children.
- **Advocacy:** Get involved with the school district's school health advisory council/school board and provide input on health-related policies that will affect individual patient care, including school wellness policies and emergency plans, and work with local AAP chapter to advocate for school

nurses in all of the district's schools.

- **Drafting health plans:** Participate in the drafting of IEPs and 504 Plans as needed. If a student with a particular special health care need or chronic disease has special education needs, an IEP may be developed using the IHP as a foundation for details on the student's disease management routine.
- **Orders:** Give a clearly written problem list, daily care instructions, accommodations, and orders for the use of emergency medications (eg, epinephrine auto-injector, albuterol) and the necessary current prescriptions to keep these medications and devices available in school for use in a particular student's emergency. This information is used by the school nurse to create the student's IHP and ECP.
- Be available to assess the individual student after an emergency and assist in a prompt and safe return to school and provide support to parents whose child sustained a medical emergency in school.
- Review the documentation and details of the student's school emergency, provide feedback, and provide instructions that amend the individual ECP as necessary.
- Communicate directly with the school physician (where available) as needed.

RECOMMENDATIONS FOR THE SCHOOL PHYSICIAN^{2,54}

The school physician (including school district physician and physician health provider in school-based health centers), if one is available, is uniquely positioned to interact with schools in each of the previously mentioned steps and provide global and system-based recommendations related to individual students' medical emergency readiness as follows:

- Assist administration and collaborate with the school nurse in the planning, development, training, implementation, review, evaluation, update, and approval of the school emergency plan and protocols for individual student emergencies,⁷ including medical emergencies and injuries that occur in school, after school, in transport, and on the playground.
- Work collaboratively with other stakeholders (school staff, EMS personnel, law enforcement, social worker, counselors) to ensure that the individual student emergency preparation, especially for students with chronic medical conditions, seamlessly links with the preparations for disaster planning.
- Be familiar with the spectrum of medical diagnoses of individual students in each of the schools in the district to effectively assist the school nurse in obtaining, interpreting, and implementing the IHP, ECP, IEP, and 504 Plans for those students and to anticipate the schools' needs and resources to deal with anticipated emergencies.
- Assist in the development and periodic assessment of programs for emergency education, training, and retraining of school staff and designated volunteers in emergency procedures, including basic life-support, first aid, AED use, and emergency medication administration.¹⁵
- Act as a liaison between the medical home and the school staff to ensure continued communication regarding a student's IHP, ECP, IEP, or 504 Plan.
- Provide guidelines and recommendations on the contents of the emergency kit and ensure that the kit medications are safe, accessible, and in adequate supply⁸ (see AAP policy statement, "Guidelines for Emergency Medical Care in School,"¹² for a guideline for kit contents).
- Oversee school emergency drills in collaboration with the local EMS, hospitals, and community agencies.
- Establish a program for regular AED maintenance, testing, and repair when an AED is available in the school⁵⁵ (see Table 2 for highlights of the elements of an AED plan).
- Oversee and manage the medical emergency response actions on behalf of an affected student (if present in school during an emergency).
- After a student emergency occurs, review the records of the school's management of the medical emergency, its response and adherence to the emergency protocol, the adequacy of services provided, and the accuracy and completeness of data recorded to evaluate access to and quality of emergency services and materials, and make necessary recommendations for changes in the school's protocols, supplies, and individual student ECPs.
- Act as a liaison between the medical home and the local school of the student who sustained the emergency to ensure adequate communication, perform any needed changes/modifications to the student health plan, and assist the primary care clinician in ensuring the student's safe return to class after an emergency.
- Work collaboratively with the district's school health services director to coordinate and assist in the implementation of the above recommendations. In some school districts where a school physician is not available, the school health services director is positioned to fulfill these recommendations in collaboration with school-based clinicians that may include nurse practitioners and/or physician assistants.

CONCLUSIONS

School preparedness for an individual student medical

emergency intervention is heavily dependent on a team effort that involves the school administration and its physician (if applicable), the individual school health and safety team and its nurse, the local community (EMS, local hospital/emergency department), and the student's medical home/primary care clinician. Continued and timely communication between the student's medical home and the school are key to ensure that updated IHPs, ECPs, 504 Plans, and IEPs are established, when applicable. Some of the documents referenced in this statement can be used as communication tools. The primary care clinician should advise parents and caregivers, particularly for a child with a chronic illness, to be familiar with and support the school emergency preparedness plan. In addition, medical home clinicians and school physicians can be the best advocates to help a school obtain needed life-saving emergency services for a student with a particular condition. The medical home clinician can play a key role in supporting the school's efforts in ensuring students' safety in school, particularly those with special health care needs.

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ABBREVIATIONS

AAP: American Academy of Pediatrics

AED: automated external defibrillators

CDC: Centers for Disease Control and Prevention

CERP: cardiac emergency response plan

CPR: cardiopulmonary resuscitation

ECP: emergency care plan

EIF: emergency information form

EMS: emergency medical services

IEP: individualized education program

IHP: individualized health plan

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