



School Nursing Evidence-based
Clinical Practice Guideline:
**Medication Administration
in Schools**

School Nursing Evidence-based Clinical Practice Guideline: Medication Administration in Schools

Author

Martha Dewey Bergren, DNS, RN, NCSN, PHNA-BC, FNASN, FASHA, FAAN
Clinical Professor Emerita, University of Illinois Chicago College of Nursing
Executive Editor, *The Journal of School Nursing*
Nampa, Florida

NASN Lead

Erin D. Maughan, PhD, RN, PHNA-BC, FNASN, FAAN
Director of Research
Silver Spring, MD

NASN would like to thank the following contributors to the literature search process:

Karen J. Madura, MPH, RN, NCSN
Doctor of Nursing Practice Student and Teaching Associate University of Illinois Chicago
Chicago, Illinois

Rebecca Raszewski, MS, AHIP
Associate Professor, Information Services & Liaison Librarian, University of Illinois Chicago
Chicago, Illinois

NASN would like to thank the following expert panel members for their valuable contributions to the clinical practice guideline:

Melanie K. Bales, MSN, BSN, RN, CMS
Nursing Supervisor, Cobb County School District
Marietta, Georgia

Corinna Brower, MPH, BSN, RN-BC
State School Nurse Consultant, Oregon Health Exchange
Portland, Oregon

Cheryl De Pinto, MD, MPH, FAAP
AAP Council of School Health
Baltimore, Maryland

Amany Farag, PhD, RN
Associate Professor, College of Nursing, The University of Iowa
Iowa City, Iowa

Michael J. Gaunt, PharmD
Medication Safety Analyst and Editor, Institute of Safe Medication Practices
Horsham, Pennsylvania

Philip E. Johnson, RPh, MS, FASHP, FHOPA
Retired
Tampa, Florida

Ann Marie McCarthy, PhD, RN, FNASN, FAAN
Professor, College of Nursing, The University of Iowa
Iowa City, Iowa

Ann O. Nichols, MSN, RN, NCSN
State School Health Nurse Consultant, North Carolina Department of Health
Raleigh, North Carolina

Deb Robarge, BSN, RN, NCSN
Executive Director, Indiana Association of School Nurses
Fishers, Indiana

Robin Wallin, DNP, RN, CPNP-PC, NCSN
Director of Health Services, Parkway Schools
Ballwin, Missouri

NASN would like to thank the following reviewers for their valuable contributions to the clinical practice guideline:

Tami Jakubowski, DNP, CPNP-PC, CSN
Associate Professor, College of New Jersey
Ewing, New Jersey

Marian S. Larkin, MD, FAAP
American Academy of Pediatrics Council on School Health
New York, New York

Debbie Martinez, PhD, PNP, RN
Director Health Services, Bassett Unified School District
La Puente, California

Eileen Moss, DNP, RN, PEL-CSN, NCSN
Lead Nurse, New Lenox School District
Adjunct Instructor, University of Illinois Chicago
New Lenox, Illinois

Tracy Perron, PhD, RN, CNE, CSN
Associate Professor, College of New Jersey
Ewing, New Jersey

Hanna Phan, PharmD, FCCP, FPPA
Clinical Associate Professor, University of Michigan – College of Pharmacy
Clinical Pharmacist Specialist, Ambulatory Care, Pediatric Pulmonology
C.S. Mott Children’s Hospital, Michigan Medicine
Pediatric Pharmacy Association
Ann Arbor, Michigan

Krista Schroeder, PhD, RN
Assistant Professor of Nursing, Temple University
Philadelphia, Pennsylvania

Ann Stillwater, MEd, RN
Certified School Nurse, Capital Area School for the Arts Charter School
Harrisburg, Pennsylvania

In addition, NASN would like to thank the AGREE II reviewers for their expert analysis of the process and quality of the clinical practice guideline:

Martha Engelke, PhD, RN, CNE, FAAN

Emeritus Professor, East Carolina University
Greenville, North Carolina

Robin A. Shannon, DNP, RN, NCSN, PHNA-BC

Clinical Assistant Professor, University of Illinois Chicago
Chicago, Illinois

Susan K. Malone, PhD, RN

Assistant Professor, New York University, Rory Meyers College of Nursing
New York City, New York

Mayumi Willgerodt, PhD, MPH, RN

Associate Professor, University of Washington
Seattle, WA

Disclaimer:

This guideline was made possible through support from the Centers for Disease Control and Prevention through the cooperative agreement, “National Collaboration to Support Health, Wellness and Academic Success of School-Age Children” (CDC-RFA-DP16-1601).

Suggested citation: National Association of School Nurses. (2021). *Medication Administration Clinical Practice Guidelines in the School*. Author.

All evidence-based clinical guidelines from the National Association of School Nurses automatically expire five years after publication unless reaffirmed, revised, or retired at or before that time.

Copyright (2021) by the National Association of School Nurses. All rights reserved. This publication is protected by copyright. No part of it may be reproduced in any form without the written permission of the publisher. Permission of NASN is required for all derivative works, including compilations and translations.

Rationale

School nurses care for 56.4 million students in elementary, middle, and high schools across the United States (US Department of Education, 2020). Twenty-five percent of children have chronic conditions (CDC, 2019), many of whom require medication during the school day. Other students require medication for acute health problems, medications for life threatening emergencies or as-needed (prn) medications for transient health issues, discomfort, or other symptoms.

Despite the amount of medication administration that occurs in school daily, there is little in the literature to guide best practices. In some states, state-level guidelines summarize state regulations or dictate the standards and processes to be followed. However, given the lack of empirical literature, those state school nursing manuals rely on tradition and professional judgment for suggested practices.

School nurses join the sub-specialty from a variety of backgrounds. Experience in other clinical settings, such as hospitals or clinics with pediatric patients, is not a prerequisite for school nursing. Therefore, school nurses who have no previous clinical experience or who have worked primarily with adults may not be aware of the standards of care in child health nursing and medication administration for children. In the school health setting, school nurses' practice in isolation and medication practices may vary from building to building within a school district (Maughan et al., 2018).

Clinical Practice Guidelines (CPG) for medication administration exist for other healthcare settings. This guideline seeks to create a uniform clinical practice guideline for the administration of medications in schools. CPGs are based on existing evidence. Establishing a CPG for medications administered in schools provides direction for state school nurse consultants, school districts and nurses working independently in schools by creating the structure and processes of care to lead to optimal outcomes including increased medication adherence, fewer errors and decreased morbidity and mortality. The *School Nursing Evidence-based Clinical Practice Guideline: Medication Administration in Schools* can guide school policy and provide evidence for policy changes for state legislation.

Purpose

The purpose of the CPG is to give the school nurse evidence-based recommendations for the safe care of Pre-K–12 grade students who receive medications during the school day.

The *School Nursing Evidence-based Clinical Practice Guideline: Medication Administration in Schools* does not address special circumstances, such as medication administration modifications in a pandemic, or medications that are not traditionally administered in school, such as chemotherapy, or medication administration issues that are better addressed in CPGs for a specific chronic condition. Oxygen administration, medical cannabis, and medications administered via g-tube are not addressed.

It is expected that this medication administration CPG will promote the health, safety and achievement for children who receive medication in school. Specifically, the *School Nursing Evidence-based Clinical Practice Guideline: Medication Administration in Schools* will improve the structure, processes, and outcomes of medication administration in schools. Goals include

- Decrease in medication errors
- Adoption of standardized reporting of medication errors
- Strengthen security measures and resources
- Increase annual medication administration audits across school systems
- Increase adoption of Fair and Just Culture
- Adoption of medication reconciliation practices

Methodology

The methodology used to prepare for this evidence-based guideline is the *Model for Developing Evidence-Based Clinical Guidelines for School Nursing* (Shannon & Maughan, 2020).

This Guideline is intended as a decision-making tool to guide professional school nurses in implementing the most recent, evidence-based practice recommendations as of the date of publication. The results of future studies may require revisions to this guideline to reflect new scientific data.

This Guideline is not intended to create a rule or legal standard of care, nor should it be interpreted as encouraging, advocating, requiring, or discouraging any particular treatment. All decisions regarding care of students should be made by the health care team, family and student in consideration of the student's particular health and circumstances, clinical presentation and authorized policies. Clinical decisions involve the application of nursing judgement to the student's condition and available courses of action.

Neither NASN nor its officers, directors, members, employees, or agents, will be liable for any loss, damage, or claim with respect to any liabilities, including direct, special, indirect, or consequential damages, incurred in connection with this Guideline or reliance on the information presented in it.

Definitions and Abbreviations of Terms

504: Plan developed under the Section 504 of the Rehabilitation Act of 1973
Alternative medication: Medication that is not standard medical care such as dietary supplements or herbal medication

Caregiver: Responsible adult who looks after a child under the direction of parent or guardian

CDC: Centers for Disease Control and Prevention

Clinical trial: A research study in which one or more human subjects are prospectively assigned to one or more interventions (which may include placebo or other control) to evaluate the effects of those interventions on health-related biomedical or behavioral outcomes (National Institute of Health, 2017)

Controlled medication / controlled substance: A drug or other substance that is tightly controlled by the government because it may be abused or cause addiction. The control applies to the way the substance is made, used, handled, stored, and distributed. Controlled substances include opioids, stimulants, depressants, hallucinogens, and anabolic steroids. Controlled substances with known medical use – such as morphine, Valium, and Ritalin – are available only by prescription from a licensed medical professional. Other controlled substances, such as heroin and LSD, have no known medical use and are illegal in the United States (National Cancer Institute, n.d.).

CPG: Clinical Practice Guideline

Culture of Safety or Fair and Just Culture: A shift from the culture of blaming individuals responsible for medical errors to one of vigilance that is fair and just

Delegation: Allowing a delegatee to perform a specific nursing activity, skill, or procedure that is beyond the delegatee's traditional role and not routinely performed in the school community setting. Delegation occurs when the school nurse assigns the performance of a specific nursing task to another person, often an UAP (NCSBN, 2016).

EAP: An Emergency Action Plan is developed by a registered professional school nurse using terminology understood by school personnel and non-health professionals. An EAP outlines action steps necessary to recognize and respond to health crises. An EAP includes nursing considerations and school-site-specific processes, such as where medications are stored, who will take specific actions, and procedures school personnel should follow (Lepkowski & Maughan, 2020).

EHR: Electronic Health Record

Experimental medication: A substance that has been tested in the laboratory and has been approved by the US Food and Drug Administration (FDA) for testing in people. Clinical trials test how well experimental drugs work and whether they are safe to use. An experimental drug may be approved by the FDA for use in one disease or condition but still be considered investigational in other diseases or conditions. It is also called IND, investigational agent, investigational drug, and investigational new drug (National Cancer Institute, n.d.)

FERPA: Family Education Rights Privacy Act

HIPAA: Health Information Portability and Accountability Act

Homeopathic medication: Medications from plant, mineral or biological materials that are not approved by the US Food and Drug Administration (FDA)

IDEA: The Individuals with Disabilities Education Act is a law that makes available a free appropriate public education to eligible children with disabilities throughout the nation and ensures special education and related services to those children

IEP: An Individualized Education Plan is required by the Individual with Disabilities Education Act.

IHP: An Individualized Healthcare Plan is developed by the registered professional school nurse using the nursing process in collaboration with the student, the family and the student's healthcare providers. An IHP is designed to coordinate care, manage a student's health condition in school, inform school education planning and promote a student's health, academic success and optimize attendance (NASN, 2020).

Just Culture: See Culture of Safety

Licensed prescriber: A licensed healthcare provider with the authority to prescribe medication. Licensed prescribers may vary by state and may include physicians, advanced practice nurses, physician assistants, dentists, podiatrists, and optometrists.

LPN: Licensed Practical Nurse

Medication audit: A systematic review of all medication administration documentation

Medication error: A medication error is any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient, or consumer. Such events may be related to professional practice, healthcare products, procedures, and systems including prescribing, order communication, product labeling, packaging, and nomenclature, compounding, dispensing, distribution, administration, education, monitoring, and use. (NCCMERP, 2021). Medication errors include incorrect person, incorrect medication, incorrect dose, incorrect time, incorrect route, incorrect or missing documentation, missing dose, and wrong weight.

Medication reconciliation: Comprised of 5 steps: (1) Develop a list of current medications; (2) Develop a list of medications to be prescribed; (3) Compare the medications on the two lists; (4) Make clinical decisions based on the comparison; and (5) Communicate the new list to appropriate caregivers and to the patient. In order to recognize vulnerabilities for medication errors, numerous efforts are underway to encourage all healthcare providers and organizations to perform a medication reconciliation process at various patient care transitions (Barnsteiner, 2008).

NPA: State Nurse Practice Act

Off-label medication: The use of a drug absence of labeling for a specific age group or for a specific disorder that is not included in the package insert (approved labeling) for that drug (Frattarelli et al., 2014).

OTC: Over-the-Counter medication or non-prescription medication, by any route, including topical over the counter medication

Parent: "Parent" is used to collectively refer to whoever has guardianship over the child.

PRN: As needed

Quality improvement: Program to improve medication safety management focused on systematically identifying medication safety risks and preventing medication errors

RN: Registered nurse

Second victim: A healthcare professional who commits an error and is traumatized by the event

School Nurse: A registered nurse (RN) who works in the school setting

Six rights of safe medication administration: The right person, right medication, right dose, right route, right time, and right documentation

Standing order: A prewritten order from a prescriber that authorizes a person or class of people (e.g., paramedics, registered nurses) who are not prescribers to administer a medication in a specific circumstance

Stock medications: A supply of medications that can be used by multiple people or students. In schools, stock medications may include emergency medications or over-the-counter medication.

Supervision: The provision of guidance or direction, oversight, evaluation, and follow-up by the licensed nurse for the accomplishment of a delegated nursing task by unlicensed assistive personnel

UAP: Unlicensed assistive personnel include certified nursing assistants (CNAs), health aides, health techs, secretaries, clerks, teachers, principals, and other personnel without a healthcare license.

Systematic search and selection of relevant literature

The systematic literature search was conducted according to the steps in the *Model for Developing Evidence-Based Clinical Guidelines for School Nursing* (Shannon & Maughan, 2020) with the assistance of a health sciences librarian. The body of the literature was searched and the EBP Guideline Decision Tree (Appendix A) was applied to ensure the highest quality, relevant literature. Additional sources were added from the identified articles' reference lists. One hundred seventeen articles and EBP sources were obtained in the search. Literature that met the Quick Filter Criteria (relevant source, relevant population, applicable to practice) was evaluated and graded.

The final body of evidence represents the most recent, relevant, applicable, and available articles and publications.

Databases: PubMed, CINAHL, ERIC

Inclusion criteria: English language, since 2000

Excluded: Special circumstances (COVID, etc.); chemotherapy; anesthesia, intramuscular, parental, intrathecal, nasogastric, G-tube and articles that were specific to management of a particular health condition. Also excluded are disciplinary issues related to illegal sale of medication in schools, drug abuse or theft.

School nurse medication guidelines literature search procedure

An initial search was conducted in PubMed and CINAHL for the key words *drug therapy* OR *medication management* AND *school health services* OR *school mental health services* OR *school nursing* OR *School health* OR *School based* OR *Schools*. The initial search resulted in 575 articles. Articles relevant to medication management and guidelines in schools were narrowed by excluding those for schistosomiasis OR dental OR vaccine, resulting in 474 articles. Further exclusions were identified based on critical appraisal using the critical appraisal evidence decision tree to identify relevancy. General articles related to substance abuse of students (124), infectious disease/infection control (67), parasitic infection (76), medication stimulant use related to school performance (34), asthma and allergy management, (54), diabetes, epilepsy, and pediculosis (9) that were determined to not be related to medication administration were excluded resulting in 111 articles. Although most reviews limit searches to 5 years, no dates were excluded in the original search resulting in the oldest relevant article from 1973. English language was an inclusion criterion, but school medication guidelines from other countries were not excluded in the search process. Consequently, 22 articles dated from 1973 through 1999 were eliminated, as were six articles with English abstracts, but the full text was not in English (Norwegian, Japanese, and French). Further critical appraisal of the literature resulted in 20 articles (Sixteen [16] research articles, Four [4] policy or position statements). Fifteen (15) sources were added from the gray literature and five (5) articles were added from reference lists or recommended by a reviewer. Two (2) articles published after the initial search were located in a subsequent search. In total, 42 references were used for the CPG. The ERIC database was also explored with no additional articles or publications located.

Critical Appraisal of the Literature

The final body of evidence was critically appraised to establish level, quality, and subsequent strength of practice recommendations.

Due to the lack of rigorous evidence, a panel of experts, including members of the American Academy of Pediatrics, practicing expert school nurses, school nurse scholars, and pharmacists were convened to discuss gaps in the evidence related to recommendations. Members of the panel of experts along with additional experts reviewed and contributed to the evidence appraisal and practice recommendations. A second panel of experts used the AGREE II Instrument to assess the quality of the guideline and recommendations for use. All panelists and reviewers declared they did not have a conflict of interest. Selected modifications based on expert panel critical appraisal were incorporated into the guideline and practice recommendations. NASN also completed an independent review.

Translation into Practice Recommendations

The following recommendations are based on the most recent quality evidence to inform schools and school nurses on safe practices related to medication administration in the school setting.

Recommendations are organized by the following domains: medication policies; delegation; training; security; administering medications; over the counter/PRN medication; emergency medication; alternative, off-label, experimental; field trips/off-campus school events; quality improvement; medication disposal; self-carry/self-administration; medication reconciliation; and verbal orders.

The recommendations are based on the available literature. The preponderance of the evidence is based on studies that are cross-sectional and use tools that are not reliability/validity tested. Many studies use a convenience sample; even studies that recruited from a random selection of potential participants include only those who voluntarily responded. Many study outcomes are based on self-report (e.g., asking “how many medication errors”) versus independent validation (e.g., reviewing high quality documentation of medication errors). More research is needed on medication administration in schools related to the domains of this CPG and student health outcomes.

Although the rigor and strength of the evidence is limiting, a critical outcome of medication administration is a student benefiting from therapeutic levels of prescribed medication; and critical negative outcomes to prevent are morbidity and mortality. The benefits of avoiding negative outcomes and achieving positive outcomes are important. Therefore, considering those potential outcomes and based on the critical appraisal of the evidence and the expert panel review, it is recommended that *School Nursing Evidence-Based Clinical Practice Guideline: Medication Administration in Schools* be adopted into practice.

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

Medication Administration Guidelines	Domains	References by Strength* (ABC) See Appendix B
<p>School district medication policies</p> <p>The school nurse should lead the development of medication administration policies. If there is no school district medication administration policy, the school nurse should alert school district administrators and should be a member of the team designing, implementing, and evaluating medication administration policy development. School district medication policies</p> <ul style="list-style-type: none"> • Align with <ul style="list-style-type: none"> ○ State and Federal laws, regulations, and standards and ○ State nurse practice acts. • Are uniform across all school district's schools. • Identify the person whose job is specifically designated to health services and is accountable for medication administration. • Restrict medication administration to only medication that must be administered during the school day. • Specify who may deliver medication to the school. • Require authorized licensed prescriber's order for prescribed medication and OTC medication. <ul style="list-style-type: none"> ○ Orders must include student name, drug name, dose, route, frequency, prescriber name and contact information, pharmacy name and contact information and expiration date. ○ Orders must be renewed at the start of every school year. ○ Changes in orders must be in writing from the prescriber. • Require written parental consent for medication administration. • Include informing parents annually about <ul style="list-style-type: none"> ○ Parent rights and responsibilities regarding medication administration in school and ○ Policies and procedures for medications in emergencies. • Specify inclusion of medication administration in Section 504 plans, IEPs, IHPs and Emergency Action Plans. <ul style="list-style-type: none"> ○ If a student has a Section 504 accommodation plan or an Individualized Education Plan for an IDEA eligible student, medication administration should be included in the plan. ○ All students with emergency medications should have an Emergency Action Plan. ○ Students who receive medication for chronic conditions should have medications included in the IHP. ○ School nurses may use discretion on creating IHPs for students who do not have chronic health conditions and who receive medications at school. 	<p>State policies and regulations</p> <p>School district policy</p>	<p>A:</p> <p>B: 7, 9, 20</p> <p>C: 23, 42</p> <p>A:</p> <p>B: 7, 9, 10, 20</p> <p>C: 2, 3, 4, 15, 17, 22, 23, 26, 30, 31, 32, 33, 34, 37, 39</p>

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

<ul style="list-style-type: none"> • Student medication is confidential per FERPA. <ul style="list-style-type: none"> ○ Student confidentiality and privacy is protected during medication administration process. ○ Written parent authorization should be obtained to exchange information between the school nurse and the licensed prescriber. <p>Note: Sources for school district policies are state laws and regulations, the state nurse practice act, the state school board association, state school nurse affiliate associations</p>		<p>A:</p> <p>B: 1, 2, 7, 8, 16, 41</p> <p>C: 12, 13, 15, 17, 22, 23, 24, 31, 33, 34, 37, 39</p>
<p style="text-align: center;">Delegation</p> <ul style="list-style-type: none"> • Align with <ul style="list-style-type: none"> ○ State laws, regulations, and standards ○ State Nurse practice acts ○ Clarify accountability between the principal and the school nurse • RNs should administer medications in schools <ul style="list-style-type: none"> ○ Where state laws and NPA allow, LPNs can administer medication if an RN is not available ○ Delegation to Unlicensed Assistive Personnel (UAP) is a nursing decision if allowed by school district policy and state laws and regulations. <ul style="list-style-type: none"> – UAPs should have initial and annual assessment and training on medication administration in schools conducted and documented by the school nurse. – The school nurse must select, conduct initial and annual assessment and training, and provide ongoing supervision to the UAPs for medication administration. – If there is no school nurse, a school physician must select, train, and provide ongoing supervision for the UAP for medication administration. – The school nurse decides whether or not to delegate medication administration to a specific student, in a specific situation or to a specific UAP based on professional health and safety criteria. The decision should be communicated to the family and school administration and documented. – The UAP must agree to perform medication administration. – The school nurse should not delegate medication administration to more than three UAPs and not more than three school sites. • School nurse staffing must be adequate for the school nurse to supervise the LPNs and UAPs assigned to administer medications. • Only licensed prescribers may direct school personnel on medication administration. Parents cannot prescribe or change the licensed prescriber’s order including dosage, frequency, or route. Parents cannot bypass the school nurse and cannot delegate directly to a UAP. Parents are encouraged to partner with the school in the medication administration plan as prescribed by the licensed prescriber. 	<p style="text-align: center;">State policies and regulations</p>	<p>A:</p> <p>B: 1, 3</p> <p>C: 23, 26, 42</p>
	<p style="text-align: center;">School district policy</p>	<p>A:</p> <p>B: 1, 7, 10</p> <p>C: 23, 31, 39</p>
	<p style="text-align: center;">Delegation</p>	<p>A:</p> <p>B: 1, 2, 4, 7, 9, 20</p> <p>C: 23, 30, 31, 32</p>

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

Training	Training	A:
<ul style="list-style-type: none"> • Licensed nurses should have initial and annual assessment and training on medication administration in schools. • In addition to the content specified for UAPs (below), training for licensed nurses should include <ul style="list-style-type: none"> ○ State delegation laws and scope of practice ○ Calculation of safe dose ranges in children <ul style="list-style-type: none"> – The school nurse must calculate the safe dose range prior to the medication being administered by an LPN or UAP. – A robust assessment of the school nurse’s calculation skills should be conducted upon hire and competency should be assessed regularly. If needed, remediation and or/coaching should be provided. ○ Definition and examples of medication errors ○ Medication error prevention and reporting ○ Culture of safety ○ Partnerships with pharmacists for training can be considered. • UAPs <ul style="list-style-type: none"> ○ The school nurse should be a lead member of the team designing, implementing, and evaluating medication administration training for UAPs. ○ Initial and ongoing medication administration training of UAPs is conducted by the school nurse. ○ Initial, annual, and ongoing administration training and competency assessment of UAPs are documented. ○ Training includes <ul style="list-style-type: none"> – Signs and symptoms of common emergencies – Location of individual student action plans and general school Emergency Action Plans, and school policies on emergency medication administration – General standards of safe administration of medication – Student-specific instructions – Legal and practice standards – Student privacy and confidentiality – Storage requirements – When to contact the school nurse – Uses and side effects of medications – Medication administration process – Confirmation of students swallowing oral medication – Definition and examples of medication errors – Medication error prevention and reporting ○ UAPs should be observed doing a demonstration of medication administration. ○ UAPs should pass a written medication administration test. ○ The UAP will sign the following: <ul style="list-style-type: none"> – Documentation of successful medication administration training – A successful medication administration skills checklist 	Training	A:
		B: 1, 2, 7, 8, 16, 41
		C: 12, 13, 15, 17, 22, 23, 24, 31, 33, 34, 37, 39

*This guideline is intended to be a decision-making tool and doesn’t replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

<ul style="list-style-type: none"> • Parent education <ul style="list-style-type: none"> ○ An informational session for parents should be considered at the start of school year and with intermittent reminders. ○ Parent should be notified of what to do if school delays/schedule changes. ○ Parent should be informed of the process and should participate if an IHP/504 is needed. ○ Safe medication administration in school assumes that the person administering medication is aware of all the medication a student receives before and after school. ○ Parent should inform program staff if student was given medications the evening or the morning before school. ○ School nurses should consider partnering with pharmacists for parent education regarding student medication administration at school. 		
<p style="text-align: center;">Security</p> <ul style="list-style-type: none"> • Medication should be delivered to school by a responsible adult in an original pharmacy labeled container or manufacturer’s package. • Access to nonemergency medication is restricted to the school nurse and staff trained to administer medications. • Medication is counted and documented upon receipt and signed by the school staff member and the adult delivering the medication. • All nonemergency medication should be stored securely in locked storage. • Medications requiring refrigeration should be stored in locked refrigerators per the temperature specifications of the manufacturer, and the refrigerator temperature should be monitored on a regular basis. • Medication should not be stored with food. • Emergency medications should be stored securely with a plan for quick access. • Controlled substances should be double-locked. • Medication should not be left unattended or in a unsecured room. • Controlled medication is counted upon receipt and with each dose. Counts by two personnel should be conducted and documented no less than weekly. 	<p style="text-align: center;">State policies and regulations</p>	<p>A:</p> <p>B:</p> <p>C: 26</p>
	<p style="text-align: center;">Security</p>	<p>A:</p> <p>B: 2, 3, 9, 20</p> <p>C: 14, 15, 26, 31, 33, 39</p>
<p style="text-align: center;">Administering medication</p> <ul style="list-style-type: none"> • The first dose of a newly prescribed medication should not be administered at school. • The school nurse should explain the medication to the student prior to the first time it is administered at school. 		<p>A:</p> <p>B: 4, 20</p> <p>C: 23, 36</p>
	<p style="text-align: center;">Medical administration</p>	<p>A:</p> <p>B: 3, 6, 7, 9, 16, 19, 20</p>

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline Medication Administration Translation into Practice Recommendations

<ul style="list-style-type: none"> • Distractions and interruptions during medication administration should be minimized. The medication preparation and administration area should be conducive to minimize distractions and interruptions. • Side effects should be noted and reported to the parent and the licensed prescriber. • School district policy should specify if verbal orders may be accepted from a licensed prescriber (check state laws and NPA). The policy should also indicate <ul style="list-style-type: none"> ○ How much time can elapse prior to obtaining a written order ○ Who may accept a verbal or email/e-prescription order ○ How it is transcribed and documented • The school nurse adheres to the “Six rights” to safe medication administration: <ul style="list-style-type: none"> ○ Right student <ul style="list-style-type: none"> – Medication cannot be pre-prepared (i.e., set out, measured) for administration at a later time or to be administered by another individual. – Student identity should be verified by two different means, for example: <ul style="list-style-type: none"> ◇ Name verification (What is your name? Not: Are you Sam Jones?) ◇ Photo identification <ul style="list-style-type: none"> · Student photo identification or photo on medication administration record ○ Right medication <ul style="list-style-type: none"> – The school nurse should review a newly prescribed medication order and verify it matches the delivered drug. – The school nurse should verify the newly prescribed medication is appropriate for the student and prescribed purpose. – Medication should be checked with the licensed prescriber order twice. – Medication should be in original pharmacy containers with a pharmacy label or the manufacturer’s original container. – Medication should be stored per manufacturer directions. – Check expiration date. – Check student allergies and verify the prescribed medication is not something to which the student is allergic. ○ Right dose <ul style="list-style-type: none"> – When transcribing the dose to the Medication Administration Record, always use leading zeros before a decimal amount of less than one, and do not use trailing zeros after a decimal. – When transcribing dose to the MAR, metric units should be used whenever possible. – Avoid using mls or cc abbreviation; use the preferred abbreviation mL. – Before administering the first time <ul style="list-style-type: none"> ◇ Recorded weights should be measured, not parent or child report. ◇ Measure the student’s weight in kilograms on a kilogram scale. 		<p>C: 12, 13, 14, 15, 17, 23, 26, 28, 29, 31, 33, 34, 35, 36, 38, 39</p>
---	--	--

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

- ◇ Avoid conversions from pounds to kilograms.
- ◇ The medication record should indicate the weight is to be entered in kilograms; if an EHR, the EHR should prompt for weight to be recorded in kilograms.
- ◇ Calculating safe dose range
 - The prescribed dose should be checked using an approved pediatric drug reference to determine if the dose falls within the recommended dose over 24 hours for the student's weight and age.
 - If the dose prescribed exceeds the recommended safe daily dose range,
 - » The pharmacy may be consulted for assistance.
 - » The parents and the licensed prescriber should be notified.
- ◇ Review documentation for dose to be administered (check twice).
- ◇ Calculate the amount of medication for the correct dose.
- ◇ Clarify dosage in mL if prescriber uses terms that are not recommended: tablespoon (15mL) versus teaspoon (5mL).
- ◇ Use standard medication dosing instruments (oral metric syringes, not cups or droppers) that only display metric scale volume. Do not use kitchen utensils (tablespoons and teaspoons).
- ◇ When medication dose changes, a new prescription container label should be requested to replace the outdated dosage label.
- ◇ Licensed prescribers change medication doses. Parents may not change prescribed doses or medication labels.
- Right route
 - Review documentation for route of administration.
- Right time
 - Review documentation for the time to be administered. Medication ordered every four hours or more often may be administered 30 minutes before or after the scheduled time. Medications ordered less frequently than every four hours AND the administration schedule is not deemed critical may be administered an hour before or an hour after the scheduled time.
 - If outside of the time parameter, use nursing judgment as to whether to administer the drug, documenting the actual time and reason for variance. Then develop a plan to accommodate the student and facilitate future schedule adherence.
 - Students who do not report for medication administration should be located. If a student chronically does not report for medication at the scheduled time, a plan for reminders should be instituted.
 - A missed dose is a medication error.
 - Explore direct delivery of medication from pharmacy to school to prevent missed and late doses.

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline Medication Administration Translation into Practice Recommendations

<ul style="list-style-type: none"> ○ Right documentation <ul style="list-style-type: none"> • Medication administrative documentation includes medication administration record, up-to-date medication list, up-to-date list of allergies (including description of the adverse reaction), indication for use, adverse reactions, actual current weight in kilograms, permission for self-administration of medication, physician order and parent consent forms, and if pertinent, IHCP, IEP, Individual Action Plans, 504 plans. • Medication should be documented promptly and legibly after administration on medication administration record. • Medication administered to the wrong student, or wrong medication dose (including missed dose), time, or route are medication errors and are recorded in the student record and on an incident report form. • Student refusal of the medication should be documented and the parent notified. • If a prescribed medication to be administered at school is taken at home or prior to school, it should be documented on the MAR. • UAP documents and reports medication errors to the school nurse. The school nurse reports and documents the report of medication error to principal, parent, and school district risk manager. • Lost, wasted, dropped, stolen medications are recorded on incident forms and reported to the nurse, principal, parent, and school district risk manager. The licensed prescriber may be notified if warranted. 		
<p style="text-align: center;">Over the counter / PRN medication</p> <ul style="list-style-type: none"> • All policies for prescribed medications apply to OTCs. • OTC policies must be aligned with state laws and regulations. • A licensed provider order and written parent consent is required for all OTC and nonemergency stock medications. • School physicians may write standing orders for stock OTCs if state regulations allow. • Parent or caregiver should inform program staff if student was given medication the evening or the morning before school • If an OTC or stock medication is administered, the school nurse will use discretion whether to notify parent/guardian. (Consider obtaining parental direction for notification when PRN or OTC medications are administered (e.g. PRN or OTC drugs). 	School policies	<p>A:</p> <hr/> <p>B: 3,4,20</p> <hr/> <p>C: 5, 23, 24, 26, 37</p>

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

<p style="text-align: center;">Emergency medication</p> <ul style="list-style-type: none"> • School district emergency medication policies should align with <ul style="list-style-type: none"> ○ State laws, regulations, and standards ○ Nurse practice acts • School policies should specify that school personnel may assume parent consent is given for emergency medications. • School policies and procedures should specify when emergency medications are to be administered and who may administer emergency medication. • The school nurse provides emergency medication training to all unlicensed personnel who may administer emergency medications. • Emergency medications should be stored in a secure manner that allows access at all times. • Standing orders are required for stock (undesigned) emergency medications. 	Emergency	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">A:</td></tr> <tr><td style="padding: 2px;">B: 20</td></tr> <tr><td style="padding: 2px;">C: 23, 26, 31</td></tr> </table>	A:	B: 20	C: 23, 26, 31
A:					
B: 20					
C: 23, 26, 31					
<p>Non-FDA Approved Medication. (Alternative, off-label, experimental medications)</p> <ul style="list-style-type: none"> • School districts need clear policies on medications or dosages that are not FDA approved for children. • School districts need clear policies for administering medications prescribed for off-label purposes. • The school nurse must consult state law and school policies before administering non-FDA approved medication. • Off-label medications should be administered by a licensed nurse or healthcare provider per state laws and regulations. • Requests for off-label and experimental medication must be accompanied by drug information that supports clinical decision making. • Principals, parents, and licensed prescribers must communicate with the school nurse to assure safe administration of experimental medication for students in clinical trials. • Information should be provided to the school and school nurse on the purpose, side effects, allergy potential, administration schedule, safe dosage, storage requirements, and intended benefit for the student. • Requests for non-standard medications, off-label, experimental medications and nutrition supplements, dosages that exceed manufacturer recommendations do not need to be honored. • Safe dose ranges cannot be determined for alternative and homeopathic medications and therefore should not be administered in schools. <p>Note: Alternative medications are not FDA approved. Experimental medications are approved for use within an FDA authorized clinical trial. Many commonly used drugs are used for indications that are not FDA approved, but supported by FDA approved publications and processes. Off-label uses may be supported by compendia, literature, or a multidisciplinary patient review board.</p>	State policies and regulations	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">A:</td></tr> <tr><td style="padding: 2px;">B:</td></tr> <tr><td style="padding: 2px;">C: 23, 26, 31, 37</td></tr> </table>	A:	B:	C: 23, 26, 31, 37
A:					
B:					
C: 23, 26, 31, 37					

*This guideline is intended to be a decision-making tool and doesn't replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

<p style="text-align: center;">Field trips / off-campus school events</p> <ul style="list-style-type: none"> • All school district policies that apply to medication administered in school apply to medication administered to a school student participant at a school-sponsored, off-campus event. • If a UAP is administering medication on a field trip or other school-sponsored, off-campus event, the school nurse supplies the person’s training, the medication, instructions for use, the schedule, and a method to document the medication was administered. • If a student is responsible and demonstrates correct administration skills, self-carry is an option. 	<p style="text-align: center;">Field trips/off-campus events</p>	A:
<p style="text-align: center;">Quality improvement</p> <ul style="list-style-type: none"> • School districts should use standardized, comprehensive, detailed forms for parent consent, medication administration, documentation, licensed prescriber authorization, error reporting including identification of contributing factors and risk-reductions strategies /corrective action, standing orders, self-administration, and field trips / off-campus medication administration. • A systematic review of medication administration should be conducted at least annually. <ul style="list-style-type: none"> ○ Review alignment between state laws and district policy annually for updates (Note: CPGs may be more rigorous than state laws that are not based on evidence). ○ Conduct an audit of medication administration process annually. An audit should include all documentation: licensed provider prescribing form, written parent approval; medication administration record, current medication list, current list of allergies, current weight in kilograms and, if pertinent, IHP, IEP, Individual Action Plans, 504 plans, permission for self-administration of medication. • Culture of safety <ul style="list-style-type: none"> ○ Increase culture of safety by decreasing stigma and increasing vigilance for medication errors. ○ Create a nonpunitive, fair and just culture and reporting system through training and forums on culture and continuous quality improvement. ○ Provide Second Victim support for the licensed provider or UAP who experiences a medication error. • School district policy should include medication error reporting process; standard forms are recommended. • “Sentinel events” where significant patient harm occurs should follow reporting required by the state. • Consider partnerships with pharmacists and community providers in the quality improvement process. 		B: 1, 3, 4
		C: 22, 31
<p style="text-align: center;">Quality improvement</p> <ul style="list-style-type: none"> • School districts should use standardized, comprehensive, detailed forms for parent consent, medication administration, documentation, licensed prescriber authorization, error reporting including identification of contributing factors and risk-reductions strategies /corrective action, standing orders, self-administration, and field trips / off-campus medication administration. • A systematic review of medication administration should be conducted at least annually. <ul style="list-style-type: none"> ○ Review alignment between state laws and district policy annually for updates (Note: CPGs may be more rigorous than state laws that are not based on evidence). ○ Conduct an audit of medication administration process annually. An audit should include all documentation: licensed provider prescribing form, written parent approval; medication administration record, current medication list, current list of allergies, current weight in kilograms and, if pertinent, IHP, IEP, Individual Action Plans, 504 plans, permission for self-administration of medication. • Culture of safety <ul style="list-style-type: none"> ○ Increase culture of safety by decreasing stigma and increasing vigilance for medication errors. ○ Create a nonpunitive, fair and just culture and reporting system through training and forums on culture and continuous quality improvement. ○ Provide Second Victim support for the licensed provider or UAP who experiences a medication error. • School district policy should include medication error reporting process; standard forms are recommended. • “Sentinel events” where significant patient harm occurs should follow reporting required by the state. • Consider partnerships with pharmacists and community providers in the quality improvement process. 	<p style="text-align: center;">State policies and regulations</p>	A:
		B: 20
		C: 23, 26, 31, 41
<p style="text-align: center;">Quality improvement</p> <ul style="list-style-type: none"> • School districts should use standardized, comprehensive, detailed forms for parent consent, medication administration, documentation, licensed prescriber authorization, error reporting including identification of contributing factors and risk-reductions strategies /corrective action, standing orders, self-administration, and field trips / off-campus medication administration. • A systematic review of medication administration should be conducted at least annually. <ul style="list-style-type: none"> ○ Review alignment between state laws and district policy annually for updates (Note: CPGs may be more rigorous than state laws that are not based on evidence). ○ Conduct an audit of medication administration process annually. An audit should include all documentation: licensed provider prescribing form, written parent approval; medication administration record, current medication list, current list of allergies, current weight in kilograms and, if pertinent, IHP, IEP, Individual Action Plans, 504 plans, permission for self-administration of medication. • Culture of safety <ul style="list-style-type: none"> ○ Increase culture of safety by decreasing stigma and increasing vigilance for medication errors. ○ Create a nonpunitive, fair and just culture and reporting system through training and forums on culture and continuous quality improvement. ○ Provide Second Victim support for the licensed provider or UAP who experiences a medication error. • School district policy should include medication error reporting process; standard forms are recommended. • “Sentinel events” where significant patient harm occurs should follow reporting required by the state. • Consider partnerships with pharmacists and community providers in the quality improvement process. 	<p style="text-align: center;">Quality Improvement</p>	A:
		B: 1, 4, 7, 9, 20
		C: 12, 13, 15, 17, 18, 23, 25, 31, 34, 32, 37, 39,

*This guideline is intended to be a decision-making tool and doesn’t replace clinical nursing judgement (see full disclosure).

School Nursing Evidence-based Practice Clinical Guideline

Medication Administration Translation into Practice Recommendations

<p style="text-align: center;">Medication disposal</p> <ul style="list-style-type: none"> • Medications should be returned to the parents at the end of the school year, upon transfer to another school, or if medication is discontinued or expired. • Medication return should be documented, dated, timed, and signed by the school nurse and the parent. • Medications not retrieved by parents should be disposed of according to packaging instructions and state health and environmental protection requirements. • Medication disposal, including controlled drugs disposal, should be witnessed and documented including the amount of medication disposed. • Document in the student’s record that medication was disposed. • Consider “Take back” programs at police departments, pharmacies, colleges of pharmacy, hospitals, and clinics for disposal. 		<p>A:</p> <p>B:</p> <p>C: 22, 26, 31, 32, 33, 37</p>
<p style="text-align: center;">Self-carry / Self-administration</p> <ul style="list-style-type: none"> • Determine state law and regulations for school district policy for student self-administration. • Responsible students should be allowed to self-administer and self-carry. • Self-administration procedures should be outlined in the school district rules. • Parent should consider supplying an additional dose to be stored in the health office for students who self-carry and self-administer. • Controlled substances should not be self-carry. • Self-carry medication must be with the student and cannot be left unattended. 	<p style="text-align: center;">State policies and regulations</p> <p style="text-align: center;">School district policies</p> <p style="text-align: center;">Security</p>	<p>A:</p> <p>B: 20</p> <p>C: 23, 26, 31, 40</p> <p>A:</p> <p>B: 1, 2, 7, 10, 20</p> <p>C: 22, 31, 37, 39, 40</p> <p>A:</p> <p>B: 20</p> <p>C: 22, 23, 26</p>
<p style="text-align: center;">Medication reconciliation</p> <ul style="list-style-type: none"> • A complete and accurate list of medications of all the student’s medications, both during school and at home, should be created and confirmed with parents and licensed prescribers <ul style="list-style-type: none"> ○ At every transition of care (change of setting, provider, or level of care) ○ When new medications are ordered or existing orders are rewritten (including discontinued) • A good faith effort to collect this information is recognized as meeting the intent of the recommendation 		<p>A:</p> <p>B: 3,4,20</p> <p>C: 5, 23, 24, 26, 37</p>

*This guideline is intended to be a decision-making tool and doesn’t replace clinical nursing judgement (see full disclosure).

References

- American Nurses Association. (2012). *Principles of delegation*. Author. <https://www.nursingworld.org/~4af4f2/globalassets/docs/ana/ethics/principlesofdelegation.pdf>
- Barnsteiner, J.H. (2008). Medication reconciliation. In R.G. Hughes, (Ed). *Patient safety and quality: An evidence-based handbook for nurses*. Agency for Healthcare Research and Quality, Chapter 38. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK2648/>
- Centers for Disease Control and Prevention. (2019). Healthy schools. National Center for Chronic Disease Prevention and Health Promotion. <https://www.cdc.gov/chronicdisease/resources/publications/factsheets/healthy-schools.htm>
- Frattarelli, D. A., Galinkin, J. L., Green, T. P., Johnson, T. D., Neville, K. A., Paul, I. M., Van Den Anker, J. N., & American Academy of Pediatrics Committee on Drugs (2014). Off-label use of drugs in children. *Pediatrics*, 133(3), 563–567. <https://doi.org/10.1542/peds.2013-4060>
- Lepkowski, A.M. & Maughan, E. D. (2018). *School nursing evidence-based clinical practice guidelines: Students with seizures and epilepsy*. National Association of School Nurses. <https://cdn.fs.pathlms.com/GngsroHbTKyilSb60wfl?cache=true>
- Maughan, E.D., McCarthy, A.M., Hein, M., Perkhounkova, Y., & Kelly, M.W. (2018). Medication management in schools: 2015 survey results. *The Journal of School Nursing*, 34(6), 468–479. <https://doi.org/10.1177/1059840517729739>
- National Association of School Nurses (NASN). (2020). *Use of individualized healthcare plans to support school health services* (Position Statement). National Association of School Nurses. <https://www.nasn.org/advocacy/professional-practice-documents/position-statements/ps-ihps>
- National Cancer Institute. (n.d.) *Dictionary of cancer terms*. National Institute of Health (NIH). <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/experimental-drug>
- National Coordinating Council for Medication Error Reporting and Prevention (NNMERP), (2021). *About medication errors: What is a medication error?*. Author. <https://www.nccmerp.org/about-medication-errors>

- National Council of State Boards of Nursing (NCSBN). (2016.) National guidelines for nursing delegation. *Journal of Nursing Regulation*, 7(1),5-14. https://www.ncsbn.org/NCSBN_Delegation_Guidelines.pdf
- National Institute of Health (NIH), (2017). Clinical trials. *NIH's definition of a clinical trial*. <https://grants.nih.gov/policy/clinical-trials/definition.htm>
- Shannon, R. A., & Maughan, E. D. (2019). A model for developing evidence-based clinical practice guidelines for school nursing. *The Journal of School Nursing*, 36(6), 415–422. <https://doi.org/10.1177/1059840519880938>
- U.S. Department of Education. (2020). *Fast facts: Back to school statistics*. National Center for Education Statistics. <https://nces.ed.gov/fastfacts/display.asp?id=372>

References (of literature review)

- American Academy of Pediatrics Council on School Health (2009). Policy statement-guidance for the administration of medication in school. *Pediatrics*, 124(4), 1244–1251. <https://doi.org/10.1542/peds.2009-1953>
- Barnsteiner, J.H. (2008). Medication reconciliation. In R.G. Hughes, (Ed). *Patient safety and quality: An evidence-based handbook for nurses*. Agency for Healthcare Research and Quality, Chapter 38. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK2648/>
- Butler, S. M., Boucher, E. A., Tobison, J., & Phan, H. (2020). Medication use in schools: Current trends, challenges, and best practices. *The Journal of Pediatric Pharmacology and P-Therapeutics*, 25(1), 7–24. <https://doi.org/10.5863/1551-6776-25.1.7>
- Canham, D.L., Bauer, L., Concepcion, M., Luong, J., Peters, J., & Wilde, C. (2007). An audit of medication administration: A glimpse into school health offices. *Journal of School Nursing*, 23(1), 21-27. doi:1059-8405-23-1-21. <https://doi.org/10.1177/10598405070230010401>
- Clay, D., Farris, K., McCarthy, A.M., Kelly, M.W., & Howarth, R. (2008). Family perceptions of medication administration at school: Errors, risk factors, and consequences. *The Journal of School Nursing*, 24(2), 95-102. <https://doi.org/10.1177/10598405080240020801>
- Davis-Alldritt, L. & Patterson, B. (2017). Medication administration in the school setting. (pp. 381-407). In C. Resha & V. Taliaferro (Eds.). *Legal resource for school health services*. SchoolNurse.com

- Donoghue, E.A. & Kraft, C.A. (2019). *Managing chronic health needs in child care and schools*. American Academy of Pediatrics. source/resource-library/practice-resources/position-statements/weighingallpatientsinkilograms.pdf?sfvrsn=9c0709e_6
- Farris, K.B., McCarthy, A.M., Kelly, M.W., Clay, D., & Gross, J.N. (2003). Issues of medication administration and control in Iowa schools. *Journal of School Health*, 73(9), 331-337. <https://doi.org/10.1111/j.1746-1561.2003.tb04188.x>
- Ficca, M., & Welk, D. (2006). Medication administration practices in Pennsylvania schools. *The Journal of School Nursing*, 22(3), 148-155. <https://doi.org/10.1177%2F10598405060220030501>
- Foster, L.S., & Keele, R. (2006). Implementing an over-the-counter medication administration policy in an elementary school. *The Journal of School Nursing*, 22(2), 108-113. <https://doi.org/10.1177/105984050602200208>
- Gois Paixao, M.J. (2017). Interventions for reducing medication errors in children in hospitals. *Clinical Nurse Specialist*, 31, 77-78. <https://doi.org/10.1097/NUR.0000000000000276>
- Hootman, J., Schwab, N. C., Gelfman, M. B., Gregory, E. K., and Pohlman, K. J. (2005). School nursing practice: Clinical performance issues. In N. C. Schwab & M. H. Gelfman (Eds.), *Legal issues in school health services: A resource for school administrators, school attorneys, school nurses*. Sunrise River Press.
- Kahn, S., & Abramson, E. L. (2019). What is new in paediatric medication safety? *Archives of Disease in Childhood*, 104(6), 596-599. <https://doi.org/10.1136/archdischild-2018-315175>
- Kelly, M.W., McCarthy, A.M., & Mordhorst, M J. (2003). School nurses' experiences with medication administration. *The Journal of School Nursing*, 19(5), 281-287. <https://doi.org/10.1177%2F10598405030190050601>
- Joint Commission International (TJC). (2020). Home care: Medication. *Home care: 2021 National Patient Safety Goals*. https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2021/ome_npsg_jan2021.pdf
- Levine, SR, Cohen, MR, Blanchard, NR et al. (2001). Guidelines for preventing medication errors in pediatrics *Journal of Pediatric Pharmacology and Therapeutics*, 6, 426-442. [in Taketomo, C.K., Hodding, J.H., & Kraus, D.M. (2018). *Lexicomp Pediatric & neonatal drug handbook* [American Pharmacists Association, Wolters]

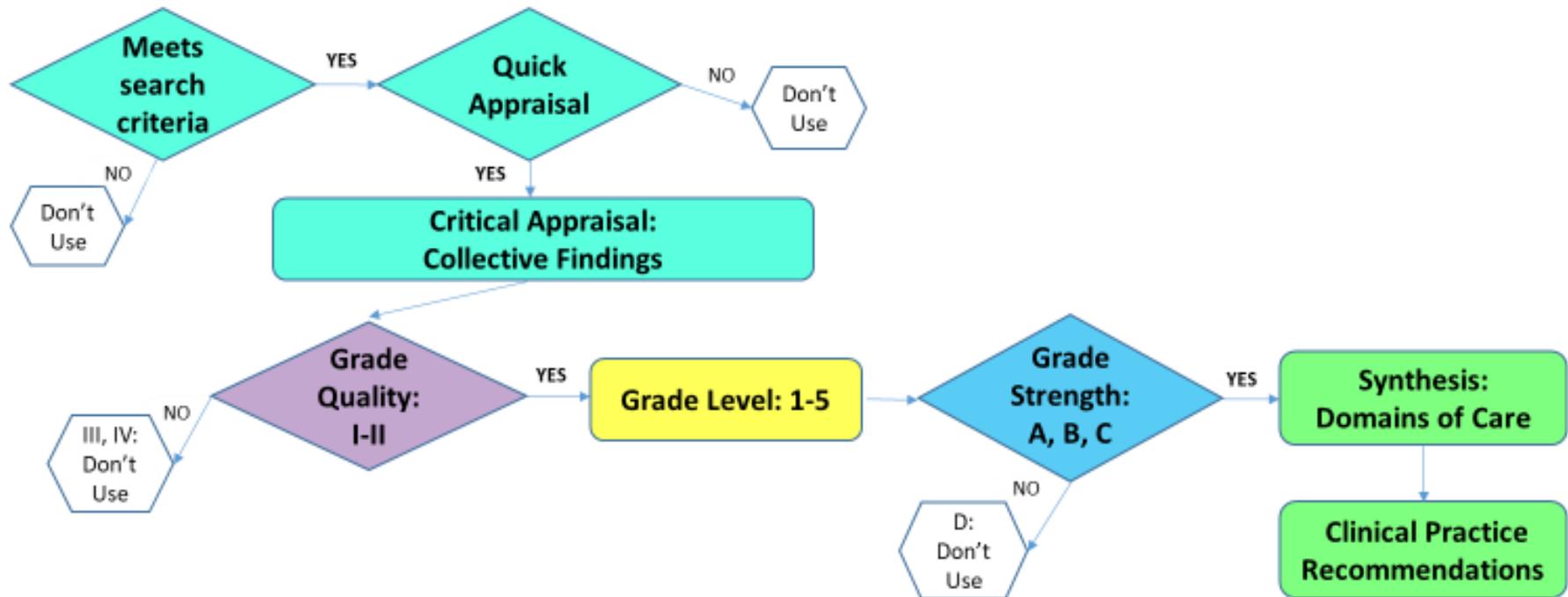
- Little, M.M., Eischens, S., Martin, M.J., Nokleby, S., Palombi, L.C., Van Kirk, C., . . . Seifert, R. (2018). Medication management in Minnesota schools: The need for school nurse–pharmacist partnerships. *Journal of the American Pharmacists Association: JAPhA*, 58(1), 67–72.e1. <https://doi.org/10.1016/j.japh.2017.10.007>
- Maughan, E.D., McCarthy, A.M., Hein, M., Perkhounkova, Y., & Kelly, M.W. (2018). Medication management in schools: 2015 survey results. *The Journal of School Nursing*, 34(6), 468–479. <https://doi.org/10.1177/1059840517729739>
- Mazur–Mosiewicz, A., Pierson, E.E., & McIntosh, D.E. (2009). Legal issues in school health services and school psychology: Guidelines for the administration of medication. *Psychology in the Schools*, 46(9), 813–819. <https://doi.org/10.1002/pits.20421>
- McCarthy, A.M., Kelly, M.W., & Reed, D. (2000). Medication administration practices of school nurses. *Journal of School Health*, 70(9), 371–376. <https://doi.org/10.1111/j.1746-1561.2000.tb07277.x>
- McClanahan, R., Shannon, R.A., & Kahn, P. (2019). School health office management (pp. 888–908). In J. Selekman, R.A. Shannon, & C.F. Yonkaitis (Eds). *School Nursing: A comprehensive text*. F.A. Davis.
- National Association of School Nurses. (2017). *Medication administration in schools* (Position Statement). <https://nasn.org/advocacy/professional-practice-documents/position-statements/ps-medication>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2007). *Recommendations to reduce medication errors in non-health care settings*. Author. <https://www.nccmerp.org/recommendations-reduce-medication-errors-non-health-care-settings>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2015a). *Recommendations to enhance accuracy of administration of medications*. Author. <https://www.nccmerp.org/recommendations-enhance-accuracy-administration-medications>
- National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2015b). *Recommendations to reduce medication errors associated with verbal medication orders and prescriptions*. Author. <https://www.nccmerp.org/recommendations-reduce-medication-errors-associated-verbal-medication-orders-and-prescriptions>

- National Council for Prescription Drug Programs (NCPDP). (2014). NCPDP recommendations and guidance for standardizing dosing recommendations on prescription container labels or oral liquid medications. Author. https://www.ncpdp.org/NCPDP/media/pdf/WhitePaper/DosingDesignations-OralLiquid-MedicationLabels_1.pdf?ext=.pdf
- Phan, H., Butler, S. M., Tobison, J., Boucher, E. A., & Advocacy Committee of behalf of the Pediatric Pharmacy Association (2020). Medication use in schools. [Position statement]. *The Journal of Pediatric Pharmacology and Therapeutics*, 25(2), 163-166. <https://doi.org/10.5863/1551-6776-25.2.163>
- Potter, P.A., Perry, A.G., Stockert, P. & Hall, A. (2020). *Fundamentals of Nursing*. Elsevier. (p.79)
- Reutzel, T.J., & Holtorff, M. (2005). Community pharmacists' awareness of and involvement with medications intended for use in primary and secondary schools. *Journal of the American Pharmacists Association: JAPhA*, 45(2), 179-184. <https://doi.org/10.1331/1544345053623564>
- Reutzel, T.J., & Patel, R. (2001). Medication management problems reported by subscribers to a school nurse listserv. *The Journal of School Nursing*, 17(3), 131-139 <https://doi.org/10.1177/10598405010170030401>
- Reutzel, T.J., Patel, R., & Myers, M.A. (2001). Medication management in primary and secondary schools. *Journal of the American Pharmaceutical Association*, 41(1), 67-77 [https://doi.org/10.1016/s1086-5802\(16\)31207-4](https://doi.org/10.1016/s1086-5802(16)31207-4)
- Reutzel, T. J., Rafinski, M., Dang, T., & Nithyanandam, L. (2009). Medication management in primary and secondary schools: Assessing the knowledge and opinions of parents. *Journal of the American Pharmacists Association*, 49(3), 417-422. <https://doi.org/10.1331/JAPhA.2009.07161>
- Reutzel, T., & Watkins, M. (2006). Medication management in primary and secondary schools. *American Journal of Pharmaceutical Education*, 70(1), 7. <https://doi.org/10.5688/aj700107>
- Ridling, D., Christensen, P., Harder, L. R., Gove, N., & Gore, S. (2016). Pediatric nurse performance on a medication dosage calculation assessment tool. *Journal of Pediatric Nursing*, 31(2), e133-e140. <https://doi.org/10.1016/j.pedn.2015.10.016>
- Ryan, J.B., Katsiyannis, A., Losinski, M., Reed, R., & Ellis, C. (2014). Review of state medication policies/guidelines regarding psychotropic medications in public schools. *Journal of Child and Family Studies*, 23(4), 704-715. <https://doi.org/10.1007/s10826-013-9805-3>

- Stegall-Zanation, J., & Scolaro, K.L. (2010). Medication management in North Carolina elementary schools: Are pharmacists involved? *Journal of the American Pharmacists Association*, 50(6), 720–722. <https://doi.org/10.1331/JAPhA.2010.09180>
- Stillwater, A.R. (2018). Medication errors: The school nurse as second victim. *NASN School Nurse*, 33(3), 163–166. <https://doi.org/10.1177/1942602X17747294>
- Toups, M.M., Press, V.G., & Volerman, A. (2018). National analysis of state health policies on students' right to self-carry and self-administer asthma inhalers at school. *Journal of School Health*, 88(10), 776–784. <https://doi.org/10.1111/josh.12681>
- Walsh, K. E., Kaushal, R., & Chessare, J. B. (2005). How to avoid paediatric medication errors: a user's guide to the literature. *Archives of Disease in Childhood*, 90(7), 698–702. <https://doi.org/10.1136/adc.2003.048827>
- Wilt, L., & Foley, M. (2011). Delegation of glucagon(r) in the school setting: A comparison of state legislation. *The Journal of School Nursing*, 27(3), 185–196. <https://doi.org/10.1177/1059840511398240>
- Yin, H.S., Parker, R.M., Sanders, ...Wolf, M.S. (2016). Liquid medications errors and dosing tools: A randomized controlled experiment. *Pediatrics*, 138(4) e20160357. doi: <https://doi.org/10.1542/peds.2016-0357>

APPENDIX A

Clinical Practice Guideline Evidence Decision Tree



Tables of Evidence

Reference (Author, year, title)	Purpose/ Research Question	Study Design, Sample Size and Characteristics	Major Strengths (S) and Limitations (L)	Summary of Findings and Recommendations	Theme (s)	Quality / Level / Strength of Evidence		
<p>1. Canham, D.L., Bauer, L., Concepcion, M., Luong, J., Peters, J., & Wilde, C. (2007). An audit of medication administration: A glimpse into school health offices. <i>The Journal of School Nursing</i>, 23(1), 21-27. https://doi.org/10.1177%2F10598405070230010401</p>	<p>Review specific elements of medication practices and identify areas needing improvement.</p>	<p>Descriptive, 5 nurses in 8 schools across 4 districts. Suburban area with both affluent and impoverished neighborhoods</p>	<p>(S) Data sources were medication logs, provider authorization forms and prescription labels.</p> <p>(S) Anecdotal explanation of errors and other statements from office personnel</p> <p>(S) Medications administered by UAPs who received annual training</p>	<p>-154 medications included</p> <p>Results: Wide range of errors, discrepancies: Problems: transcription, orders or lack thereof, storage.</p> <p>Inaccurate time 12.5%, 29% missed doses, expired medication, documentation errors, using inaccurate medication dosage measurements (e.g. kitchen teaspoons).</p> <p>Recommendations: -Importance of medication administration training and management at schools -Training a process, not just annual event -School nurses periodically evaluate school staff, conduct refresher classes - Policies for self-administration, field trip, sporting events -Auditing medication records, documents, but no recommended periodicity (No mention of incident reporting or using accurate medication measurement devices)</p>	<p>Medication errors</p> <p>UAPs</p> <p>Medication training</p> <p>Medication audits</p> <p>Medication Policies</p>	<p>II</p>	<p>5</p>	<p>B</p>

<p>2. Clay, D., Farris, K., McCarthy, A.M., Kelly, M.W., & Howarth, R. (2008). Family perceptions of medication administration at school: Errors, risk factors, and consequences. <i>The Journal of School Nursing, 24</i>(2), 95-102. https://doi.org/10.1177/2F10598405080240020801</p>	<p>Examine problems with medication administration by determining the types of problems and mistakes children experience; clarify risk factors for non-adherence, and self-reported impact on performance and social relationships</p> <p>Parent and student's perceptions of medication administration in schools</p>	<p>Descriptive, parent survey and child interview of 157 children 8-18 years old with ADHD, asthma, and diabetes in large Midwestern Medical Center</p> <p>Consecutive convenience sampling</p>	<p>(S) Sample multi-district</p> <p>(S) Children with ADHD, asthma and diabetes</p> <p>(L) Subjective, not objective</p> <p>(L) Self-report</p> <p>(L) Consecutive convenience sampling</p> <p>(L) Limited to Midwest</p> <p>(L) Limited to one medical center</p> <p>(L) Did not collect data about school staff who administers</p>	<p>Results:</p> <ul style="list-style-type: none"> - Missed dose most common error -50% reported problems (remembering, side effects, stigma). -28% reported a mistake occurred (most commonly forgetting or running out). -12% of children with ADHD missed a dose once weekly. -Child self- responsibility correlated with fewer problems, errors. <p>Recommendations:</p> <ul style="list-style-type: none"> -School nurses should supervise medication administration. - Educate those administering of importance of not missing doses (training). - Report and "consequences" for missed doses -Encourage medication prescribing for home versus school administration. -Teach and monitor self-management skills. -Ensure availability of emergency medication 	<p>Medication missed dose</p> <p>Self-management</p>	<p>II</p>	<p>5</p>	<p>B</p>
---	--	---	---	--	--	-----------	----------	----------

<p>3. Farris, K.B., McCarthy, A M., Kelly, M.W., Clay, D., & Gross, J N. (2003). Issues of medication administration and control in Iowa schools. <i>Journal of School Health</i>, 73(9), 331-337. https://doi.org/10.1111/j.1746-1561.2003.tb04188.x</p>	<p>The study determined -persons responsible for medication administration -Policies about administering prescription and nonprescription medicines and self-administration and field trip policies -Frequency and contributing factors for medication errors</p>	<p>Descriptive 850 school principals in Iowa.</p>	<p>(S) All grades included (S) Survey based on previous research (S) Random sample of all principals in state (L) Errors and diversion may be underreported. (L) Response rate less than 50% (L) One rural midwestern state (L) Goal was to survey principals, but only 76% completed the survey themselves.</p>	<p>Results: Medications were administered by nurses (48%) and secretaries (38%), health aide 11%, teacher 2%. Training required once (17.9%), yearly (31.7%), or every 2-3 years (39.3%). Almost all schools had medications policies. Only 34% were informed of medications taken at home (reconciliation). 22% used pill counts for controlled medications. 96% responded that parents brought medication to school, but also 84% reported children also brought medication to school (31% of principals and 16% of nurses; statistically significant). 50% reported self-administration allowed. 9% of students reported a history of stolen medications; 8 % reported students selling/trading medication.</p>	<p>Medication errors Medication policies Medication diversion</p>	<p>II</p>	<p>5</p>	<p>B</p>
--	---	--	--	---	---	-----------	----------	----------

				<p>Teachers (84%), child's parent (24%), school nurses (23%), health aides (14%) administered medication on school trips. 74% of schools had policy on field trip medication.</p> <p>Medications were transported in envelopes (53%), original containers (34%), locked containers (16%), and other (10%).</p> <p>Most common medication administration errors were missed or forgotten doses.</p> <p>Medication changes not communicated to the school, and increased number of students on medication were most frequently reported factors in medication administration errors.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> - Clarity in policy for accountability for medication principal versus nurse -Consider managing OTC same as prescribed medication. 				
--	--	--	--	--	--	--	--	--

				<ul style="list-style-type: none"> - Transport medication on field trips in original container, within locked container. - Improve communication between prescribers and schools on medication and changes. - Medication error, even if student fails to appear, should be documented and parents informed. - Implement a system for students to be brought to office when they do not appear for medication. - Pill counts for controlled medication - Thwart stolen medication through health office secure storage. 				
--	--	--	--	--	--	--	--	--

<p>4. Ficca, M., & Welk, D. (2006). Medication administration practices in Pennsylvania schools. <i>The Journal of School Nursing</i>, 22(3), 148-155. https://doi.org/10.1177%2F10598405060220030501</p>	<p>To determine medication administration policies and practices in Pennsylvania schools</p>	<p>Descriptive: CSNs in 700 schools</p>	<p>(S) Sampled by proportional stratified systematic random sampling of all CSNs, not just NASN members</p> <p>(S) Sampled from all Pennsylvania 3150 schools of every level</p> <p>(S) Used a modified version of a previously used tool</p> <p>(L) One state with state certified school nurses with masters-level certificate</p> <p>(L) Self-report</p> <p>(L) A few of the survey questions asked the nurses to estimate frequencies.</p>	<p>Results:</p> <p>97% had medication guidelines.</p> <p>93% required parent authorization.</p> <p>95% required provider order, but 91 % accepted prescription label.</p> <p>30% required medications in original container.</p> <p>79% did not know students' home medications.</p> <p>94% guidelines for OTC medication with 84% requiring parent permission.</p> <p>42% did not require a provider order for OTC medication.</p> <p>70% of nurses did not administer all medications. Others who administered medication were secretaries, principals, teachers, aides, parents and students.</p>	<p>Medication policies</p> <p>Delegation</p>	<p>II</p>	<p>5</p>	<p>B</p>
--	--	---	--	--	--	-----------	----------	----------

				<p>When asked if Pennsylvania Nursing Practice Act allowed delegation of medication administration, 15% agreed, 54% disagreed, and 31% responded “not sure.”</p> <p>81% stored medication in a locked container, but only 25% of refrigerator medications were locked.</p> <p>93% administered medication from original container from pharmacy.</p> <p>31% reported errors in past year: 26% missed dose; 9% no documentation of administration; 6% administered without authorization and 5% received overdose, and 4% administered to wrong student.</p> <p>Significant relationships found between errors and not holding a BSN or master’s degree, number of school sites per nurse greater than three, number of UAP categories who administer medications greater than three, and if field trip medications were transported in envelopes.</p>				
--	--	--	--	---	--	--	--	--

				<p>44% of nurses reported policies for medication delivery on field trips.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> -Nurses should participate in creating school medication policies within the parameters of the state nurse practice act. - All schools need comprehensive detailed policies and forms for parent consent, medication administration (prescription and OTC), documentation, medical provider authorization forms, reporting of errors and appropriate follow-through, standing orders for OTC medications, student self-management, storage, and field trips. 				
--	--	--	--	--	--	--	--	--

<p>5. Foster, L.S., & Keele, R. (2006). Implementing an over-the-counter medication administration policy in an elementary school. <i>The Journal of School Nursing, 22</i>(2), 108-113. https://doi.org/10.1177/105984050602200208</p>	<p>Examine the impact of a policy allowing OTC medications per parent permission only by elementary school nurses in a southern New Mexico public school district on the number of students sent home.</p>	<p>Case study in 5 schools in one 23 schools school district in New Mexico</p>	<p>(S) Data was already collected for an annual report to the state.</p> <p>(L) One school district</p> <p>(L) 5 schools limited to K- 8th grade</p> <p>(L) Simultaneous compulsory attendance policy implemented</p>	<p>Results: No significant difference between the number of students sent home after implementing a more liberal OTC policy.</p> <p>Cost of stock OTC averaged \$50 per school.</p> <p>95% of parents approved of at least one OTC to be administered.</p> <p>Recommendations: Conduct a needs assessment prior to policy changes.</p>	<p>Early Dismissal</p> <p>Medication policy change</p>	<p>II</p>	<p>V</p>	<p>C</p>
<p>6. Gois Paixao, M.J. (2017). Interventions for reducing medication errors in children in hospitals. <i>Clinical Nurse Specialist, 31</i>, 77-78. https://doi.org/10.1097/NUR.0000000000000276</p>	<p>Determine the effectiveness of interventions aimed at reducing medication errors and related harm in hospitalized children.</p>	<p>Literature review</p>	<p>(S) RCT, and controlled before-after studies incorporating 5 different interventions aimed to reduce medication errors, pharmacist as part of clinical team, CPOE, barcode administration, medication-oriented check and control checklist, preprinted order sheet</p>	<p>Results: The evidence available about the effectiveness of interventions to reduce medication errors in pediatric hospitalized population were methodologically weak to produce recommendations that are evidence based. Therefore, the conclusions of this review are mostly centered toward recommendations for research.</p> <p>No Recommendations</p>	<p>Medication errors</p>	<p>I</p>	<p>I</p>	<p>C</p>

			<p>(S) Author is a member of the Cochrane Nursing Care Field (CNCF).</p> <p>(L) Hospital specific</p> <p>(L) Studies had clinical and methodological heterogeneity, unable to aggregate data through meta-analyses.</p>					
<p>7. Kelly, M.W., McCarthy, A.M., & Mordhorst, M.J. (2003). School nurses' experiences with medication administration. <i>The Journal of School Nursing, 19</i>(5), 281-287. https://doi.org/10.1177/2F10598405030190050601</p>	<p>Determine school nurse views on medication administration.</p>	<p>Descriptive, qualitative: Focus groups. The focus groups were held in November 2001 in two areas, one rural and the other a small urban area. A total of 21 school nurses, all female, participated in these groups, 9 in one focus group and 12 in the other, representing 7 school districts.</p>	<p>(S) Combined with McCarthy (2000), mixed methods.</p> <p>(S) Sample school nurses who deliver medication</p> <p>(L) Small convenience sample</p> <p>(L) One geographic region</p>	<p>Results: Confusion over delegation and regulations; principals were most frequently cited as persons who delegate medication.</p> <p>Supervision of UAPs was "as needed".</p> <p>Mixed responses on whether comfortable with UAPs delegated medications.</p> <p>UAP Training limited</p> <p>Self-medication for asthma, but strict oversight for insulin</p> <p>Unaware of some students self-medicate, most frequently acetaminophen</p>	<p>Delegation</p>	<p>II</p>	<p>5</p>	<p>B</p>

		<p>Experience of 21 school nurses ranged 1st year school nurse, to school nurses with 20-plus years of experience, and a retired school nurse.</p>		<p>Most common medication error is missed doses. Failure of the student to report is most common reason, and medication not available is common also.</p> <p>UAPs/secretaries do not consider missed doses an error.</p> <p>Some nurses do not administer directly from original container, but from cups or trays.</p> <p>Medications sometimes delivered in baggies and envelopes</p> <p>Medications for field trips sometimes put in envelopes, leading to errors by non-nurses</p> <p>Concern expressed over controlled substances transport to school and diversion</p> <p>State medication policies and supporting materials always seemed to be “in process”.</p> <p>Recommendations: -State level guidelines for best medication practices that reflect state legislation and regulations</p>				
--	--	--	--	--	--	--	--	--

				<ul style="list-style-type: none"> -Clear guidelines on who is accountable for delegation and medication administration, the delegation to UAPs and a standardized training program -Policies that encourage self-administration and notification of the school nurse -Develop a protocol for students who do not report for medications. -Minimize the number of medications during the school day. -Pharmacist should supply a duplicate shared container. When medication dosages change per prescriber order, a new container label is needed and should be requested from the pharmacist. <p>Note: No national agency like JACHO to challenge systemic problems.</p>				
--	--	--	--	--	--	--	--	--

<p>8. Little, M.M., Eischens, S., Martin, M.J., Nokleby, S., Palombi, L.C., Van Kirk, C., . . . Seifert, R. (2018). Medication management in Minnesota schools: The need for school nurse-pharmacist partnerships. <i>Journal of the American Pharmacists Association</i>, 58(1), 67-72. e1. https://doi.org/10.1016/j.japh.2017.10.007</p>	<p>Assess the medication management needs of Minnesota school nurses.</p> <p>Determine the medication management benefits of a pharmacist nurse partnership.</p>	<p>Descriptive</p> <p>Emailed to all 200 members of School Nurse Organization of Minnesota</p>	<p>(S) 1st U.S. study to explore nursing collaborating with pharmacists to advance school medication management.</p> <p>(L) Limited to Minnesota school nurses</p> <p>(L) Did not survey pharmacists</p>	<p>Results: 155 nurses responded.</p> <p>Nurses administered majority of medications (69.9%) compared with UAPs (29%).</p> <p>90.3% of school nurses thought that a pharmacist could assist medication management.</p> <p>80% would consult with pharmacists</p> <p>12.3% had informal access to a pharmacist</p> <p>Topics that nurses would discuss with a pharmacist included new medications (71.6%), drug-drug interactions (67.1%), proper administration (52%), and storage (39.4%).</p> <p>The top MM concerns included 1) availability of students' medications and required documentation (expired, packaging, and low inventory of medication at pharmacies, 2) health literacy, 3) pharmacist consultations, 4) lack of time available for nurses to follow up with and evaluate students, 5) family-centered care (non-disclosure of home medication and self-administered at school.</p>	<p>Pharmacists</p>	<p>II</p>	<p>5</p>	<p>B</p>
---	--	--	--	--	--------------------	-----------	----------	----------

				<p>Noncompliance, OTCs, herbal, and essential oils, no funds for medications, insurance, or transportation. Using nurse's office as a clinic. Rescheduling home doses to school hours, 6) accountability of delegation to UAP, errors, field trips and work release, Training 7) communication challenges with prescribers, teachers, parents, students, and 8) professional development on New drugs. Herbal. Off-label use. Interaction of prescription drugs with alcohol and other substances. Lost or stolen medications with street value in transit with student</p> <p>Recommendations:</p> <ul style="list-style-type: none"> -Streamlining procuring medications by nurses requesting medication refills directly from pharmacy, pharmacy delivery to school. -Parent, UAP and teacher training -Pharmacist partnerships -Medication education for pharmacy, school and community -Pharmacy schools developing CE for school nurses, standardized training for UAPs 				
--	--	--	--	--	--	--	--	--

<p>9. Maughan, E.D., McCarthy, A.M., Hein, M., Perkhounkova, Y., & Kelly, M.W. (2018). Medication management in schools: 2015 survey results. <i>The Journal of School Nursing, 34</i>(6), 468-479. https://doi-org.proxy.cc.uic.edu/10.1177/1059840517729739</p>	<p>Present the key findings from a national survey on medication administration in schools.</p>	<p>Descriptive national survey 6,298 US school nurses</p>	<p>(S) National survey, relatively representative (S) NASN members and non-members (S) Large sample (S) Survey developed by experts and reviewed expertise of the investigators, critique of the survey by state school nurse consultants, and piloted. (L) Convenience sample (L) Response rate not calculated (L) Self-report</p>	<p>Results: 99.1% had school policies on medication administration. District policies (84.8%), State policies (43.5%), school-specific policies (12.3%), (81.8%) routinely monitored side effects of medications per policy. 98.7% required a parent/guardian to sign an authorization form, 96.0% required providers' order. 97.7% required parent authorization form for OTC; 65.4% required HCP's order; and 43.7% stocked OTC medications. 15.6% allowed administration of alternative medications, such as herbal medicines and dietary supplements. 75.3% allow selected students to self-carry; 87.5% required provider permission; 86.3% required parent permission; 10.2% required principal permission; 58.6% of school nurses were required to evaluate; and 67.4% required student demonstration prior to self-carry.</p>	<p>Medication policies National policies State policies</p>	<p>II</p>	<p>3</p>	<p>B</p>
---	---	---	---	--	---	-----------	----------	----------

				<p>Medications were stored in health office 84.9% and main office 10.7%. Others were stored in a variety of locations.</p> <p>Delegation to UAPs in 77.9% of schools, with in-service in 91.2%, competence measured in 80%, written test 39.7%).</p> <p>99.7% required documentation. 61.4% on a student specific page; 44.8% used EHR; 8.3% of medications were documented in a sequential multi-student log.</p> <p>46.7% had no policy for external chart audits.</p> <p>64.5% had medication policy for errors; 89.4% of those policies required a report. Policies for reporting of errors varied.</p> <p>15.3% reported errors in the last year: 58.4% being missed dose, wrong time 19%, wrong dose 18.3%, wrong medication 11.2%, not documented 10.6%, wrong student 9.9%, administered without authorization 8%. Mean errors for licensed staff was 1.5, 7.4 for UAPs.</p>				
--	--	--	--	--	--	--	--	--

				<p>School grade level, percentage of students with free and reduced lunch, level of nursing education, and number of schools statistically significant for errors. Nurses at each level of education reported more errors than those with less education. Nurse error rates were 11.1% of single schools, 19% for those responsible for two schools, 23.8% for those with three or more schools.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> -National guidelines -Alignment of district policies with state policies -Direct delivery of medications - Routine audits -Establishment of a culture of safety and reporting of errors -Except for rescue medication, medications should be locked. -Policies and practical approaches for accessible yet secure storage needed. -Training needs of UAPs must be reexamined. -UAPs must be regularly monitored by an RN. -Use documentation systems that do not require double documentation. 				
--	--	--	--	--	--	--	--	--

<p>10. McCarthy, A.M., Kelly, M.W., & Reed, D. (2000). Medication administration practices of school nurses. <i>Journal of School Health</i>, 70(9), 371-376. https://doi-org.proxy.cc.uic.edu/10.1111/j.1746-1561.2000.tb07277.x</p>	<p>Assess the current practices of nurses administering medication in schools.</p>	<p>Descriptive 1000 nurses from a random sample of NASN members; 649 participants.</p>	<p>(S) Seminal study</p> <p>(S) Medication Administration in the School Setting Instrument</p> <p>(64.9%) return rate</p> <p>(L) Sample of NASN members only</p> <p>(L) Self-report</p> <p>(L) Does not describe medication practices in schools without nurses</p>	<p>Results:</p> <p>98.1 % have written guidelines.</p> <p>91.9 have state guidelines.</p> <p>93.5% require a written provider order.</p> <p>70.9% require an order for OTC.</p> <p>23.9% accept the prescription label as an order.</p> <p>97.2% require parent authorization for prescription.</p> <p>95.9% require parent authorization for OTC.</p> <p>33.3% have a standing order for epinephrine autoinjector.</p> <p>In addition to nurses, others with access to medication include principals (62.2%), health aides (42.2%), and teachers (18.1 %).</p> <p>80% of respondents store medications in a locked cabinet in the health office.</p> <p>35.9% use refrigerated medication secure container.</p> <p>96.6% dispense medications directly from original, pharmacy-labeled container.</p>	<p>Medication policies</p> <p>Medication errors</p> <p>Delegation</p>	<p>II</p>	<p>5</p>	<p>B</p>
--	--	--	---	--	---	-----------	----------	----------

				<p>22.7% transfer medications from original container to another container, such as an envelope or a weekly medication dispenser.</p> <p>99.2% document each medication administration. Side effects are rarely documented (20.7%).</p> <p>24.3% dispense all medications. 75.6% use UAPs including secretaries (66.2%), health aides (39.7%), teachers (37.9%), others (37.7%), parents (17.7%), students (16.1%).</p> <p>76.9% provide training for UAP.</p> <p>42.5 are comfortable using UAPs, 33% are not comfortable. 15% report state nurse practice act does not allow medication delegation; 19.1% are not sure.</p> <p>76.3% of respondents' school systems allow students to self-administer. 33.7% self-administer unsupervised. 36.7% are allowed to self-carry.</p>				
--	--	--	--	---	--	--	--	--

				<p>79.7% of medication errors were missed doses.</p> <p>48.5% reported a medication error in the last year. A nurse with more education is more likely to report errors. The more students a nurse is responsible for, the more likely there are errors. UAPs were 3.1 times more likely to make medication errors than nurses.</p> <p>Recommendations:</p> <ul style="list-style-type: none"> -Examine expanding self-administration and self-carry. -Consult pharmacists on storage and “dispensing” of medication. -Clarify factors leading to medication errors. -National guidelines needed. 				
--	--	--	--	---	--	--	--	--

<p>11. Reutzel, T. J., & Holtorff, M. (2005). Community pharmacists' awareness of and involvement with medications intended for use in primary and secondary schools. <i>Journal of the American Pharmacists Association: JAPhA</i>, 45(2), 179-184. https://doi-org.proxy.cc.uic.edu/10.1331/1544345053623564 [Abstract only: electronic access unavailable]</p>	<p>Observe community pharmacists' awareness of and involvement in medications use in primary and secondary schools. Identify the interventions used to deal with medication issues.</p>	<p>Descriptive 569 licensed pharmacists with community pharmacy experience.</p>	<p>(S) Pharmacists (L) Illinois only</p>	<p>Results: -Almost all respondents reported that they dispensed medications for use in school. -2/3rds thought that taking medications at school creates the potential for special problems (e.g., missed dose, social stigma).</p> <p>Recommendations: -Increase pharmacist awareness of medication use in schools. -Additional labeled containers for use at school were the most common intervention reported.</p>	<p>Pharmacists</p>	<p>II</p>	<p>5</p>	<p>C</p>
--	---	---	--	--	--------------------	-----------	----------	----------

<p>12. Reutzell, T. J., & Patel, R. (2001). Medication management problems reported by subscribers to a school nurse listserv. <i>The Journal of School Nursing, 17</i>(3), 131-139. https://doi-org.proxy.cc.uic.edu/10.1177/10598405010170030401</p>	<p>Obtain a preliminary understanding of types of medication management problems school nurses face in primary and secondary schools and strategies used to solve those problems.</p>	<p>Content analysis of social media. An analysis of messages related to medication management that appeared on a 1,400-member discussion group for school nurses was performed. All messages sent to the listserv during a 5-month period were monitored.</p>	<p>(S) International sample</p> <p>(S) Listserv messages reflect candid, honest exchanges among members of a profession.</p> <p>(S) Not susceptible to survey biases, such as social desirability</p> <p>(S) Publicly available data</p> <p>(L) Internet connected subset of school nurses</p>	<p>Results: 71 threads on a wide array of medication management problems</p> <p>85% messages requested help. Pharmacies or pharmacists were mentioned in 14% of messages.</p> <p>Lengthy list of problems</p> <p>21% Administration 19% Therapeutic appropriateness 17% Use 10% Storage 9% Documentation 7.5% Transfer 7.5% Delegation 2% Liability Information</p> <p>Strategies for solving them Recommendations: Contribution from the pharmacy profession needed in this important and neglected area of drug therapy</p> <p>Nurses and pharmacists should collaborate to solve problems relating to medication administration.</p>	<p>Pharmacists</p>	<p>II</p>	<p>5</p>	<p>C</p>
---	---	---	--	---	--------------------	-----------	----------	----------

				<p>Policy makers at the state, school district, and individual school level also should be more proactive in the area of medication management in the schools.</p> <p>Pharmacists should provide advice, information, and packaging that would facilitate proper use in the school setting.</p> <p>Pharmacists should get involved directly with individual schools and at the aggregate level via their professional societies.</p> <p>Pharmacists should provide in-service medication management programs to schools, boards, administrators, teachers, staff, and school nurses.</p> <p>Pharmacy educators need to get involved via drug information and other consultative services, educational programming, and research.</p>				
--	--	--	--	--	--	--	--	--

<p>13. Reutzel, T. J., Patel, R., & Myers, M. A. (2001). Medication management in primary and secondary schools. <i>Journal of the American Pharmaceutical Association</i>, 41(1), 67-77. https://doi-org.proxy.cc.uic.edu/10.1016/s1086-5802(16)31207-4 [Abstract only; not available in electronic form]</p>	<p>Summarize medication management knowledge in primary and secondary schools.</p> <p>Place this knowledge in its drug use and organizational contexts.</p> <p>Provide a foundation for studying medication management.</p> <p>Develop policy- and practice-level interventions aimed at alleviating it.</p> <p>Offer recommendations for practitioners, policy makers, and health professions educators.</p>	<p>Literature review</p>	<p>(Not enough information)</p>	<p>Recommendations:</p> <p>Pharmacists and school nurses must cross professional borders if they wish to play a role in solving this important drug therapy problem.</p>	<p>Pharmacists</p>	<p>II</p>	<p>4</p>	<p>C</p>
--	---	--------------------------	---------------------------------	--	--------------------	-----------	----------	----------

<p>14. Reutzel, T. J., Rafinski, M., Dang, T., & Nithyanandam, L. (2009). Medication management in primary and secondary schools: Assessing the knowledge and opinions of parents. <i>Journal of the American Pharmacists Association</i>, 49(3), 417-422. https://doi-org.proxy.cc.uic.edu/10.1331/japha.2009.07161 [Abstract only; not available in electronic form]</p>	<p>Assess parents' knowledge and opinions of medication management in child's school and to evaluate roles for pharmacists.</p>	<p>Individuals caring for children 5 and 18 years of age who take prescription medications at 5 community pharmacies, one day care center, and one university.</p>	<p>(Not enough information)</p>	<p>Results: 86 parent surveys were collected. Of participants 89.5% reported the name of at least one prescription or OTC medication child taking at school.</p> <p>40.5% of children were taking medication for asthma and/or allergies.</p> <p>>45% of children were taking at least two medications.</p> <p>~27% of medications were taken at school.</p> <p>>60% of parents reported a nurse was present at their child's school every school day.</p> <p>28.2% and 38.8% did not know whether prescription and OTC products, respectively, were allowed on school premises.</p> <p>The most common relevant service reported to be offered at community pharmacies was an additional labeled prescription container (22.1%), which was also a service that many parents would like to have pharmacies offer (39.6%).</p>	<p>Pharmacists</p>	<p>II</p>	<p>4</p>	<p>C</p>
---	---	--	---------------------------------	---	--------------------	-----------	----------	----------

				<p>34.9% of parents desired to have a second inhaler for their child at school and 37.2% wanted the pharmacy to place label on the inhaler and not just box.</p> <p>These two services were less commonly reported as being offered at pharmacies (22.1% and 12.8%, respectively).</p> <p>Recommendation: Parents would benefit from services that community pharmacists could provide for medications taken in school.</p>				
<p>15. Reutzel, T., & Watkins, M. (2006). Medication management in primary and secondary schools. <i>American Journal of Pharmaceutical Education</i>, 70(1), 7. doi: https://doi-org.proxy.cc.uic.edu/10.5688/aj700107</p>	<p>Identify whether and how pharmacy faculty members address medication management in primary or secondary schools in their teaching, research, and service activities.</p> <p>Ascertain the extent to which they think the medication management in schools is important.</p>	<p>Descriptive499 faculty members completed a questionnaire inquiring about the research, teaching, and service activities in which they participated that related to medication management in schools.</p>	<p>(S) Pharmacy educators</p> <p>(L) Emails were blocked limiting sample or their e-mail addresses were no longer valid.</p> <p>(L) Summer launch many have yielded fewer faculty members due to vacations or 9-month contracts.</p> <p>(L) 10% response rate</p> <p>(L) Self report</p>	<p>Results:</p> <p>10.9% response rate.6.6% addressed medication management in schools in courses.</p> <p>2.6% conducted research on the topic.</p> <p>6% provided service in this area.</p> <p>On the other hand: 86.6% believed medication management in schools was either somewhat or extremely important.</p>	Pharmacists	II	5	C

		<p>(An e-mail was sent to the entire population of faculty members at US colleges of pharmacy (N 4,569).</p> <p>This population was operationally defined as individuals at US colleges of pharmacy with the word "professor" in their title as listed in the member directory on the American Association of Colleges of Pharmacy website (www.aacp.org).</p>		<p>Recommendations: Pharmacy colleges should include activities (research, teaching, and/or service) that contribute to medication management in schools.</p> <p>Essential medication management topics (1) medications brought to school and uses, side effects, and storage requirements;</p> <p>(2) common chronic diseases that school children have; (3) ways for school employees and parents to improve medication management; (4) extended release products for less-frequent dosing, making administration at school unnecessary; and (5) proper packaging/labeling.</p>				
--	--	--	--	---	--	--	--	--

<p>16. Ridling, D., Christensen, P., Harder, L. R., Gove, N., & Gore, S. (2016). Pediatric nurse performance on a medication dosage calculation assessment tool. <i>Journal of Pediatric Nursing, 31</i>(2), e133–e140. https://doi-org.proxy.cc.uic.edu/10.1016/j.pedn.2015.10.016</p>	<p>Describe and compare nurse performance on a medication dosage calculation assessment tool, considering work unit, years' experience, and certification status.</p>	<p>Descriptive</p> <p>Secondary analysis of data from 851 registered nurses (RN) at one 320-bed pediatric medical center</p>	<p>(S) Outcome measurement</p> <p>(S) Includes comprehensive literature review of nurse dosage calculations</p> <p>(L) One institution</p> <p>(L) Not specific to school setting</p> <p>(L) Reliability of the instrument was not estimated.</p> <p>(L) A calculation assessment cannot mimic work environment with noise, interruptions, etc.</p> <p>(L) References were not permitted as they would be in the work environment.</p>	<p>Results:</p> <p>The mean assessment tool score was 92.4 (47–100). 38% of the nurses received a score of 100%. One RN earned a 47%. The work unit and the interaction between certification status and experience were significant in relation to score on the calculation assessment.</p> <p>The emergency department nurses significantly outperformed all other nurses including ICU nurses.</p> <p>Only the group with 25+ years of experience had significantly different scores for certified nurses than nurses without certification.</p> <p>Recommendations: More must be done to ensure RNs have the skill and ability to calculate medication doses reliably.</p> <p>Medication calculation skill must be assessed through a valid method to ensure gaps in competency are being identified and addressed.</p>	<p>Medication dosage calculation</p>	<p>II</p>	<p>3</p>	<p>B</p>
--	---	--	---	---	--------------------------------------	-----------	----------	----------

				<p>Organizations need to determine effective methods of education and skill remediation to ensure RNs have knowledge to accurately perform medication dose calculations with every dose administered.</p> <p>Direct observation and real-time coaching may be a more appropriate assessment for some RNs.</p> <p>Utilization of certain technologies with imbedded safety features, such as barcode scanning (omitted due to acute setting) and pharmacy prepared unit doses may mitigate incorrect doses to reach the patient.</p> <p>A robust assessment of calculation skills should be conducted at the time of hire.</p> <p>Notes: Nurses who care for children must be competent to perform medication dosage calculations because most pediatric doses are weight based and obtained from adult formulations.</p>				
--	--	--	--	--	--	--	--	--

<p>17. Stegall-Zanation, J., & Sclaro, K. L. (2010). Medication management in North Carolina elementary schools: Are pharmacists involved? <i>Journal of the American Pharmacists Association</i>, 50(6), 720-722. https://doi-org.proxy.cc.uic.edu/10.1331/japha.2010.09180</p>	<p>Determine the extent of pharmacist use in medication management, roles of school nurses, and use of other healthcare providers at elementary schools in North Carolina.</p>	<p>153 (130 public and 23 private) elementary schools in four counties of North Carolina.</p> <p>Representatives from 29 schools participated in the survey (19% response rate).</p>	<p>(L) Four counties in North Carolina</p> <p>(L) Low response rate</p> <p>(L) Self report</p>	<p>Results:</p> <p>Parents/caregivers were required to check in their child's medications by 89.7% (26 of 29) of the schools, and 96.6% (28 of 29) required communication of the medication plan with the person overseeing medications at the school.</p> <p>Medication details most commonly required by the schools included dose (29 of 29), frequency (29 of 29), physicians' care plan (28 of 29), and drug name (28 of 29).</p> <p>(24 of 29) required the prescription, food interactions (23 of 29), adverse drug reactions (20 of 29), indication (17 of 29), adverse effects (16 of 29), length of therapy (15 of 29), and medical form/note (5 of 29).</p> <p>Most of the schools required medications to be kept in the administrative office (19 of 29).</p>	<p>Pharmacists</p> <p>School policy</p>	<p>III</p>	<p>5</p>	<p>C</p>
---	--	--	--	--	---	------------	----------	----------

				<p>Of the schools that responded, 96.3% (26 of 27) reported using directly observed therapy procedures to ensure children took medications.</p> <p>When asked who is primarily responsible for overseeing medications taken during school hours, 86.2% (25 of 29) used their administrative/office staff, 34.5% (10 of 29) used nurses, 13.8% (4 of 29) used teachers, 6.9% (2 of 29) used teacher assistants, and 3.4% (1 of 29) used anyone completing an online training program.</p> <p>Approximately 82.8% (24 of 29) of the schools provided training classes to their non-healthcare personnel concerning medications.</p> <p>Respondents reported using a variety of healthcare personnel at their schools, and 89.7% (26 of 29) reported having a nurse.</p> <p>None of the three private schools reported having a school nurse compared with 100% of public schools.</p>				
--	--	--	--	---	--	--	--	--

				<p>A pharmacist was consulted by only 1 of 28 schools, and the respondent from that school stated, "I regularly consult with pharmacists regarding specific medications, dosages, side effects, reactions with other meds, etc."</p> <p>41% (11 of 27) thought that a pharmacist could provide assistance concerning medication administration at their school. Of those who elaborated further, 50% (10 of 20) wanted drug information from pharmacists and 3 of 20 were unsure how a pharmacist could provide assistance.</p> <p>100% had school policy regarding medication administration during school hours.</p> <p>27 of 29 schools reported consulting with nurses on their policies.</p> <p>Only 1 of 27 respondents reported consulting with pharmacists on medication management policies.</p>				
--	--	--	--	---	--	--	--	--

				<p>93.1% reported administrative staff was responsible for medication administration at the schools.</p> <p>Recommendations</p> <p>Pharmacists need to be involved in the medication management process to ensure that school personnel are taught appropriate administration techniques (e.g., inhaler, subcutaneous injection, taking medication with or without food), adverse effects of common drugs, and interactions (e.g., drug–drug, drug–food, drug–disease) that require intervention.</p> <p>Pharmacists are also crucial in the fight against medication misuse in schools.</p> <p>Pharmacists and student pharmacists can help provide education about drug misuse to school personnel, students, and parents.</p>				
--	--	--	--	--	--	--	--	--

				<p>Reviews of prescription refills for overuse, increased presence in nonprescription or OTC aisles, and increased adult patient counseling on storage and disposal of medications are also ways community pharmacists and student pharmacists can help ensure proper medication use in children and adolescents.</p> <p>Pharmacists should proactively approach school administrators about drug information programs for staff, reviewing medication administration policies and procedures, strategies to minimize missed doses, and drug abuse and poison prevention programs.</p> <p>Unlicensed personnel need regular training programs and boosters to reinforce learning, especially since sentinel events are not regular occurrences in the school setting.</p> <p>Written policies, protocols, and emergency treatment plans along with training programs for UAP are needed.</p>				
--	--	--	--	--	--	--	--	--

<p>18. Stillwater A. R. (2018). Medication errors: The school nurse as Second Victim. <i>NASN School Nurse</i>, 33(3), 163–166. https://doi-org.proxy.cc.uic.edu/10.1177/1942602X17747294</p>	<p>Presents three cases of school nurse medication errors and second victim phenomena.</p>	<p>Case studies</p>	<p>(S) Literature summarized on medication errors in schools and second victim phenomena</p> <p>(L) Limited to three cases: nurses are reluctant to come forward and share their errors.</p>	<p>Recommendations</p> <ul style="list-style-type: none"> - Change culture to break the silence, decrease stigma - Standardized definitions for medication errors in school setting - Create a standard non-punitive reporting system for medication errors in schools using a common data set. - Create school nurse second victim support groups. 	<p>Medication errors Second victimData collection</p>	<p>III</p>	<p>5</p>	<p>C</p>
<p>19. Yin, H.S., Parker, R.M., Sanders, ...Wolf, M.S. (2016). Liquid medications errors and dosing tools: A randomized controlled experiment. <i>Pediatrics</i>, 138(4) e20160357. doi: https://doi.org/10.1542/peds.2016-0357</p>	<p>To identify attributes of labels and dosing tools that could be improved</p>	<p>Randomized controlled experiment in 3 urban pediatric clinics. English- or Spanish-speaking parents (n = 2110) of children ≤8 years old were randomly assigned to 1 of 5 study arms.</p>	<p>(S) RCT</p> <p>(S) Observed behavior administering medication</p> <p>(L) Parents were the subjects, not school employees</p>	<p>Results</p> <p>84.4% of parents made ≥1 dosing error (21.0% ≥1 large error).</p> <p>More errors were seen with cups than syringes.</p> <p>No differences in error rates were seen between the 2 syringe types.</p> <p>Use of a teaspoon-only label (with a milliliter and teaspoon tool) was associated with more errors than when milliliter-only labels and tools were used.</p> <p>Recommendation</p> <p>Oral syringes over cups, particularly for smaller doses, should be part of a comprehensive pediatric labeling and dosing strategy to reduce medication errors.</p>	<p>Medication administration</p>	<p>I</p>	<p>2</p>	<p>B</p>

OTHER EBP RESOURCES (Non-Research Sources)

Reference (Author, year, title)	Purpose	Description (Literature review, guideline, practice/policy, etc.)	Major Strengths (S) and Limitations (L)	Summary of Findings and Recommendations	Theme(s)	Quality / Level / Strength of Evidence		
<p>20. American Academy of Pediatrics Council on School Health (2009). Policy statement-guidance for the administration of medication in school. <i>Pediatrics</i>, 124(4), 1244-1251. https://doi-org.proxy.cc.uic.edu/10.1542/peds.2009-1953</p>	<p>This policy statement to guide prescribing healthcare professionals, school physicians, and school health councils on administration of medications to children at school.</p>	<p>Expert opinion Guideline</p>	<p>(S) AAP Council on School Health (S) Endorsed by ASHA (S) Cites 25 research articles (L) Few research articles specific to schools (L) Evidence is weak (L) Guidance is 11 years old (L) COSH members are 11 MDs, with liaisons of one RN and three additional MDs.</p>	<p>Recommended: -RNs should administer medications in school. -LPNs “when RN not available”. -Using UAPs is risky. -State laws, regulations, or standards establish policies for administration of medications for state’s school districts. -Liability coverage - Confidential, timely, accurate records - Identify the accountable person who is a health office employee for medication administration - Quality improvement systematic review of medication administration -IHCPs support medication. -Signed prescribing form with diagnosis / reason -Written parent approval OTC -Long-term OTC requires prescriber. - RN or physician train, supervise and delegate to UAPs.</p>	<p>State policies and regulations Delegation Medication policies</p>	<p>II</p>	<p>4</p>	<p>B</p>

				<ul style="list-style-type: none"> -Permit self-carry and self-administration by responsible students. -Parent should supply spare health office emergency medication for students who self-carry. -Secure immediate access to emergency medications at all times. -Requests for non-standard medications do not need to be honored. -Medications should be in original containers. -Medications should be stored per manufacturer. -Controlled substances double locked -Return or dispose medication at year's end. -Controlled substances or drugs with abuse risk should not be self-carry. -Medications, including self-carry, should not be unattended. -Cold and cough OTC should not be administered without a prescriber order for children under 6. -Alternative medications are administered and should require a provider order. 				
--	--	--	--	--	--	--	--	--

<p>21. Barnsteiner, J.H. (2008). Medication reconciliation. In R.G. Hughes, (Ed). <i>Patient safety and quality: An evidence-based handbook for nurses</i>. Agency for Healthcare Research and Quality, Chapter 38. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2648/</p>			<p>(S) AHRQ</p> <p>(L) Does not specifically address schools</p>	<p>Medication reconciliation is a formal process for creating the most complete and accurate list possible of a patient’s current medications and comparing the list to those in the patient record or medication orders.</p> <p>This reconciliation is done to avoid medication errors such as omissions, duplications, dosing errors, or drug interactions.</p> <p>Recommendations</p> <p>Reconciliation should be conducted at every transition of care in which new medications are ordered or existing orders are rewritten. Transitions in care include changes in setting, service, practitioner, or level of care.</p> <p>Reconciliation comprises five steps: (1) Develop a list of current medications; (2) Develop a list of medications to be prescribed; (3) Compare the medications on the two lists;</p>	Reconciliation	I	4	B
---	--	--	--	---	----------------	---	---	---

				(4) Make clinical decisions based on the comparison; and (5) Communicate the new list to appropriate caregivers and to the patient. In order to recognize vulnerabilities for medication errors, numerous efforts are underway to encourage all healthcare providers and organizations to perform a medication reconciliation process at various patient care transitions.				
<p>22. Butler, S. M., Boucher, E. A., Tobison, J., & Phan, H. (2020). Medication use in schools: Current trends, challenges, and best practices. <i>The Journal of Pediatric Pharmacology and P-Therapeutics</i>, 25(1), 7–24. https://doi-org.proxy.cc.uic.edu/10.5863/1551-6776-25.1.7</p>	Discusses current legislation and best practices	Review	<p>(S) Comprehensive</p> <p>(L) Diagnosis specific</p> <p>(L) No school nursing studies are cited – did not mention an exclusion of older articles – did not describe search strategy</p> <p>(L) Reiterates AAP statement</p>	<p>Recommendations</p> <p>Schools have policies for prescription and OTC medications.</p> <p>Schools should maintain “whenever possible” an updated list of all medications to screen for drug-drug interactions.</p> <p>Provide comprehensive and ongoing training by a registered nurse (AAP, ANA, NASN) for all school staff outlining signs and symptoms of common pediatric emergencies, location of individual student action plans and general school Emergency Action Plans, and school policies on emergency medication administration.</p>	Medication policies	III	5	C

				<p>Delegation should be outlined in school policies and should follow state and local practice regulations.</p> <p>504 for students who require services and accommodations</p> <p>Medications should be in a secure location in original containers with an accurate up-to-date prescription label at the temperature per instructions.</p> <p>Controlled substances should be double locked.</p> <p>Staff should provide guidance on documentation and medication supplies needed for parents and caretakers at informational sessions at the start of school year and with intermittent reminders.</p> <p>At the end of the year, medications should be returned to parents or disposed of per laws and regulations.</p>				
--	--	--	--	---	--	--	--	--

				<p>Documentation should be on file: up-to-date medication list, up-to-date list of allergies, current weight, Individual Action Plans, 504 plans, permission for self-administration of medication, physician order and parent consent forms.</p> <p>Medication administration policies apply to field trips, e.g. secure storage, original containers, prescription labels that include accurate instructions for use, current medication lists, actions plans and documents to complete after medication is administered.</p> <p>Controlled substances should not be self-carried. Children must be determined by nurse/ school staff, parent and prescriber to be old enough to safely self-administer and should be trained in administration and use.</p> <p>Medications that children self-administer should be on their person at all times and not left unattended including when off campus. Designated staff may carry medications if policies and regulations allow.</p>				
--	--	--	--	---	--	--	--	--

<p>23. Davis–Alldritt, L. & Patterson, B. (2017). Medication administration in the school setting. (pp. 381–407). In C. Resha & V. Taliaferro (Eds.). <i>Legal resource for school health services</i>. SchoolNurse.com.</p>	<p>Reference book</p>	<p>Expert opinion</p>	<p>(S) School specific (L) Evidence to support is weak</p>	<p>Recommendations District policy recommendations: –Must be aligned with state law and address what medication may be delivered at school and by whom; all medication must be delivered by parent or designated adult in original container labeled with name, dosage, route; when to administer; name of prescriber, pharmacy contact information and expiration date.</p> <p>All medications required a written authorized prescriber order and signed parental authorization to exchange information with the healthcare provider.</p> <p>Specify that school personnel are permitted to assume parental consent is given for emergency medications.</p> <p>Changes in medication orders must be made in writing by the prescriber. Immediate changes are acceptable via phone or email if district policy and federal and state laws and healthcare standards allow. District policy must specify who may accept a verbal order.</p>	<p>School district policies</p>	<p>II</p>	<p>5</p>	<p>C</p>
---	-----------------------	-----------------------	---	---	---------------------------------	-----------	----------	----------

				<p>Medication is counted and documented upon receipt and signed by the school staff member and adult delivering medication.</p> <p>Controlled medication is counted upon receipt and with each dose. Counts by two personnel should occur no less than weekly.</p> <p>The first dose of a medication should not be administered at school.</p> <p>Before administering any medication, documentation is reviewed for correct medication, correct / safe dose., correct amount, administration directions, expected outcomes and benefits.</p> <p>Medications should be included in Individual Care Plan, Section 504 accommodation plans and Individualized Education Plans for IDEA eligible students. All students with emergency medications should have an Emergency Action Plan.</p>				
--	--	--	--	---	--	--	--	--

				<p>Safe medications practices are followed by responsible staff including the six rights: Right: individual, medication, dose, time, route, documentation.</p> <p>All medication is securely stored in locked storage and refrigerators. Plan for quick access for emergency medication is in place.</p> <p>Access to medication is restricted to the school nurse and staff trained to administer medications.</p> <p>All OTC and stock medications require a provider order and parent permission. If administered, parent is notified.</p> <p>Medication cannot be pre-poured for later administration or be administered by another person.</p> <p>Medication administration is documented promptly and includes notation of errors made during the administration process.</p>				
--	--	--	--	---	--	--	--	--

				<p>All medication errors, including missed doses, failure to adhere to one or more of the six rights not being called to the office to receive medication, lost, wasted, dropped or stolen medication, are recorded on incident forms and reported to the parent, school nurse, school principal, and the district's risk management department.</p> <p>Initial and ongoing training and supervision of the UAP by the nurse is required and documents. Training includes general standards of safe administration of medication, student specific instructions and health needs. It will include legal and practice standards, when to call the nurse, medication administration process, and the need to observe the student swallow oral medication. The UAP will sign that they were trained and a successful skill checklist was maintained.</p>				
--	--	--	--	---	--	--	--	--

				<p>Supervision of LPNs and UAPs assigned to administer medication is conducted by the nurse. School nurse staffing must be adequate to support this function.</p> <p>The nurse decides whether or not to delegate medication administration to a specific student, a specific situation, or to a specific UAP.</p> <p>Self-administration procedures are appropriate when supported by state law, parents, and school nurse.</p> <p>All medication is returned to parent at the end of the school year, when expired or when discontinued. After notifying parents, medication may be destroyed per state laws, regulations and local ordinances.</p> <p>Medication disposal must be witnessed by another school employee, documented, and signed by both parties.</p> <p>All student medication is confidential, per FERPA and students are entitled to privacy during administration.</p>				
--	--	--	--	---	--	--	--	--

				<p>Parents do not delegate nursing tasks, including medication to school personnel.</p> <p>Parents may not change prescribed medication dosages or pharmacist labels.</p> <p>Parents are informed annually of their rights and responsibilities regarding medication administration in school.</p> <p>The school nurse or other qualified staff conducts periodic reviews of procedures of medication management.</p> <p>Off-label and non-FDA approved medication should be administered by a licensed nurse or healthcare provider per state laws and regulations. Information should be provided to the school on the purpose, side effects, allergy potential, administration schedule and consideration, proper dosage, storage requirements, and intended benefit to the student. Product information should be provided to the school nurse.</p>				
--	--	--	--	---	--	--	--	--

				<p>School nurses are not required to honor requests for nonstandard medication; dosages that exceed manufacturer recommendations; alternative, homeopathic, off-label, experimental medications; nor nutritional supplements. The request must be documented with the resolution with the parent, prescriber or school physician.</p> <p>Alternative and homeopathic medications require an authorized prescriber's order. Due to the risks and inability to verify safe dosages, they should be administered outside of the school.</p>				
<p>24. Donoghue, E.A. & Kraft, C.A. (2019). Managing chronic health needs in child care and schools. <i>American Academy of Pediatrics</i>.</p>	<p>Quick reference that addresses barriers to care of children with chronic healthcare needs at school.</p>	<p>Reference</p>	<p>(S) Follows AAP Guidelines</p> <p>(L) Does not assume a nurse is present</p>	<p>Recommendations in addition to AAP</p> <p>If there is no licensed healthcare provider in school, a licensed health consultant should support the program and conduct medication administration training and periodic review of medication administration practices and policies.</p>				

				<p>5 rights</p> <p>Child and person administering should wash hands.</p> <p>Training should require return demonstration and a written post-test. Many states have developed training programs. If they do not have one, they can use the online training program developed by AAP: Medication Administration in Early Education and Child Care Settings. https://www.aap.org/en-us/advocacy-and-policy/aap-health-initiatives/healthy-child-care/Pages/Medication-Administration.aspx</p> <p>Parents and guardians should always inform program staff whether children were given medications during the evening or the morning before attending the program.</p> <p>Sample Medication Incident Report page 241</p>		
--	--	--	--	---	--	--

<p>25. Emergency Nurses Association. (2021). Weighing all patients in kilograms [Position Statement]. ENA. https://www.ena.org/docs/default-source/resource-library/practice-resources/position-statements/weighingallpatientsinkilograms.pdf?sfvrsn=9c0709e_6</p>	<p>Position statement</p>	<p>Expert opinion</p>	<p>(S) Endorsed by AAP, ISMP, SPN</p> <p>(S) Echoed by 2020 JCI summit on weighting all patients in kilograms https://www.jointcommission.org/resources/news-and-multimedia/blogs/deline-tjc/2020/06/17/a-best-practice-in-kilograms/</p> <p>(S) Considered a best practice since 2014</p> <p>(S) Conversion from pounds to kilograms is error prone</p> <p>(S) Errors for using pounds instead of kilograms results in doses twice the dose intended</p> <p>(S) Errors for dosing in children have greater consequences than adults and are potentially fatal.</p>	<p>Recommendations</p> <p>Weights should be recorded only in kilograms.</p> <p>Scales should be configured to kilograms only with a conversion chart near the scale for reference.</p> <p>Electronic records should be designed to accept only kilogram weights.</p> <p>Medication forms should be designed to prompt weights in kilograms.</p> <p>Recorded weights should always be weights that are measured, as opposed to parent or child report.</p> <p>Add "wrong weight" category to reasons for medication error.</p>	<p>Medication errors</p> <p>Weighing in kilograms</p>	<p>I</p>	<p>4</p>	<p>C</p>
---	---------------------------	-----------------------	---	---	---	----------	----------	----------

<p>26. Hootman, J., Schwab, N. C., Gelfman, M. B., Gregory, E. K., and Pohlman, K. J. (2005). School nursing practice: Clinical performance issues. In N. C. Schwab & M. H. Gelfman (Eds.), Legal issues in school health services: A resource for school administrators, school attorneys, school nurses. Sunrise River Press.</p>	Reference book	Expert opinion (cited in Mazur-Mosiewicz, Pierson & McIntosh 2009)	(S) School specific (L) Expert opinion	<p>Recommendations</p> <ol style="list-style-type: none"> 1. Administration of any medications requires a written authorization signed by parents or individuals with parental rights and a statement from the physician that provides the name of the drug, the dose, the approximate time it is to be taken and the diagnosis or reason the medication is needed (some states allow for the use of the prescription label as the provider's written directions). 2. All medications should be delivered to the school by the parent or another responsible adult. Medications should be delivered and stored in the original pharmacy-labeled or manufacturer's package. 3. The storage of medication should comply with the manufacturer's specifications for temperature and climate for the medication. 	School district policies	II	5	C
--	----------------	---	---	---	--------------------------	----	---	---

				<p>4. The prescribed medication dosage should be checked with a drug handbook to determine if it falls within the recommended daily dosage. If it does not, the parent(s) should be contacted to check the dosage with the prescribing physician.</p> <p>5. School staff should measure, count, and then document, the initial quantity of medication delivered to the school. Preferably, the count of medication should be witnessed and signed off by the parent.</p> <p>6. If the medication involves any type of controlled drug, the count should be performed daily by the individual administering the drug and at least weekly with a witness (i.e. trained teacher or school nurse). All counts should be signed and documented by a person witnessing the count.</p>				
--	--	--	--	---	--	--	--	--

				<p>7. The school nurse should review each medication order, check whether the order matches the delivered drug, and check the correct dosage, administration directions, and compatibility with other medical treatments of the student. Based on the review, the nurse should create an individualized medication plan.</p> <p>8. When administering medications, the six right steps should be followed: the right student, the right medication, the right dosage, at the right time, at the right route, and by the right technique.</p> <p>9. Medication should be stored according to both state and federal regulations in locked and secured cabinets. Schools also should develop a plan for quick retrieval of medication in crisis situations. Controlled drugs have to be stored in double-locked cabinets, which should be additionally securely bolted to a closet wall or similar surface.</p>				
--	--	--	--	---	--	--	--	--

				<p>10. Access to medications needs to be limited to the school nurse and trained personnel selected to be responsible for the medication administration.</p> <p>11. Keys to the medication storage must be secured from general access with only the school nurse and trained, designated personnel having access.</p> <p>12. Medication must never be left out on counters when waiting for the student's arrival.</p> <p>13. Applicable initial and refresher training should be required and documented for unlicensed personnel designated to administer medications to students. Training should include standards of safe administration of medication, directions related to student-specific medications and needs, and basic legal standards of nursing practice (i.e., to call the school nurse and the need to observe students placing the medications in their mouths and swallowing them).</p>				
--	--	--	--	--	--	--	--	--

				<p>14. Professional school nurses should provide ongoing direction and supervision of UAPs assigned to administer medication.</p> <p>15. School district policy must support the school nurse decision regarding the option to delegate administration of medication to UAPs for particular students. The decision of the school nurse should be based on professional health and safety criteria and communicated to the family, healthcare provider, and school team. Moreover, the school nurse's selection of UAPs is essential for supervisory reasons regardless of state law that may permit the principal or an administrator to delegate the task.</p> <p>16. Documentation related to medication administration should be completed promptly, including errors occurring during the administration.</p> <p>17. Errors in administration of medication, which includes errors in timing (longer than 30 minutes before or after the scheduled time),</p>				
--	--	--	--	---	--	--	--	--

				<p>and missed administrations must be recorded on incident forms and reported to the parents, school nurse, building administrator, and risk management department.</p> <p>18. Medications not collected by parents at the end of the course treatment or the school year should be destroyed according to state health, environmental safety, or consumer protection agency (controlled drug division) requirements. A witness should be present during the disposal of the medication, especially any psychoactive substance.</p> <p>19. School policies and practices for medication administration must ensure that student confidentiality is protected. As all information related to health status is confidential, unlicensed personnel administering medication cannot discuss the student's health status with anyone except the delegating school nurse and, when appropriate, the school principal.</p>				
--	--	--	--	---	--	--	--	--

<p>27. Joint Commission International. (2020). Home care: Medication. <i>Home care: 2021 National Patient Safety Goals</i>. https://www.jointcommission.org/-/media/tjc/documents/standards/national-patient-safety-goals/2021/ome_npsg_jan2021.pdf</p>	<p>Standards for evaluation process that help healthcare organizations measure, assess and improve performance.</p>	<p>Accreditation standards</p>	<p>(S) Joint Commission International</p> <p>(L) Specific to home care, not schools</p>	<p>MM.07.01.03: The organization responds to actual or potential adverse drug events, significant adverse drug reactions, and medication errors.</p> <p>1. The organization follows a written process to respond to actual or potential adverse drug events, significant adverse drug reactions, and medication errors.</p> <p>2. The organization follows a written process addressing prescriber notification in the event of an adverse drug event, significant adverse drug reaction, or medication error.</p> <p>3. The organization complies with internal and external reporting requirements for actual or potential adverse drug events, significant adverse drug reactions, and medication errors.</p>	<p>Medication error reporting</p> <p>Medication reconciliation</p>	<p>I</p>	<p>5</p>	<p>C</p>
--	---	--------------------------------	---	--	--	----------	----------	----------

				<p>Notes: The Joint Commission recognizes that organizations face challenges with medication reconciliation. The best medication reconciliation requires a complete understanding of what the patient was prescribed and what medications the patient is actually taking. It can be difficult to obtain a complete list from every patient in an encounter, and accuracy is dependent on the patient's ability and willingness to provide this information. A good faith effort to collect this information is recognized as meeting the intent of the requirement.</p> <p>In settings where medications are not routinely prescribed or administered, this NPSG provides organizations with the flexibility to decide what medication information they need to collect based on the services they provide to patients. It is often important for clinicians to know what medications the patient is taking when planning care, treatment, or services, even in situations where medications are not used.</p>				
--	--	--	--	--	--	--	--	--

<p>28. Kahn, S., & Abramson, E. L. (2019). What is new in paediatric medication safety? <i>Archives of Disease in Childhood</i>, 104(6), 596–599. https://doi-org.proxy.cc.uic.edu/10.1136/archdischild-2018-315175</p>	<p>Summarizes what is new in medication safety across medication process, identifying promising innovations, gaps, directions for future efforts.</p>	<p>Review article</p>	<p>(S) Elaborates on risk of harm in community settings due to multiple care givers and school nurses. Highlights that it is often the parents providing instructions for the school nurses and other caregivers.</p> <p>(L) Focuses on hospital</p> <p>(L) Metanalysis not possible due to non-uniform studies</p> <p>Notes Highlights specific risks of child medication administration: -Weight-based dosing, dilution of small amounts of medication, immature renal and hepatic systems, limited self-administration and limited communication of children. -Heterogeneity of child medication limits use of adult medication strategies -Potential for serious harm greater in children</p>	<p>Recommended (limiting to administration recommendations, deleted infusion recommendations):</p> <ul style="list-style-type: none"> - Barcoded medication administration - Follow the six important safety processes: <ol style="list-style-type: none"> 1. Compare medication to administration record twice. 2. Minimize distractions. 3. Keep medication labeled through the process. 4. Two patient identifier checks. 5. Explain medication to patient. 6. Chart immediately. <ul style="list-style-type: none"> - Use standard dosing instruments. - Clarify prescribers' terms of tablespoons and teaspoons. - Use pictograms (does not elaborate). 	<p>Medication safety</p> <p>Medication administration processes</p>	<p>II</p>	<p>4</p>	<p>C</p>
--	---	-----------------------	---	--	---	-----------	----------	----------

<p>29. Levine, SR, Cohen, MR, Blanchard, NR et al. (2001). Guidelines for preventing medication errors in pediatrics <i>Journal of Pediatric Pharmacology and Therapeutics</i>, 6, 426-442. [in Taketomo, C.K., Hodding, J.H., & Kraus, D.M. (2018). Lexicomp Pediatric & neonatal drug handbook [American Pharmacists Association, Wolters]</p>	<p>Institute for Safe Medication Practices</p>	<p>Reference</p>	<p>(S) Drug reference manual (S) ISMP (S) American Pharmacists Association (S) Child specific (L) Prescriber and pharmacy oriented; does not include administration errors</p>	<p>Recommendations: A Complete Outpatient Prescription -Patient full name -Medication indications -Allergies -Prescriber name, phone number or pager number -Children (birthdate or age and current weight) -Drug name, dose, strength -Number of, amount to be dispensed -Complete instructions for the patient or caregiver, including purpose for the drug, directions for use (including dose), dosing frequency, route of administration, duration of therapy and the number of refills -Dosage should be expressed in convenient units of measure.</p> <p>Pharmacists should ensure the patient or caregiver demonstrates appropriate medication technique.</p> <p>Household teaspoons or tablespoons should not be used to measure liquid medication; medication administration syringes should be used.</p>	<p>Medication prescription</p>	<p>II</p>	<p>5</p>	<p>C</p>
---	--	------------------	--	---	--------------------------------	-----------	----------	----------

<p>30. Mazur-Mosiewicz, A., Pierson, E. E., & McIntosh, D. E. (2009). Legal issues in school health services and school psychology: Guidelines for the administration of medication. <i>Psychology in the Schools</i>, 46(9), 813–819. https://doi.org/10.1002/pits.20421</p>	<p>To provide guidelines necessary for safe medication administration and monitoring in schools.</p>	<p>Expert opinion</p>	<p>(S) Legal aspects (S) Emphasis on psychotropic medication</p>	<p>Recommendations: Policies should be created and revised with a medical advisor or professional school nurse.</p> <p>Medication policies and procedures for unexpected medical emergencies should be sent to parents annually.</p> <p>Delegation decisions should be made in collaboration with student, family, medical professional, and school team members.</p> <p>Delegation must align with state law.</p> <p>Delegating injectable, intravenous, or rectal medications is often prohibited, unless for life-saving situations.</p> <p>Cannot delegate if nursing assessment required before administration of a medicine.</p> <p>Delegation should be based on factors including the stability of the student’s health condition, complexity of medication administration, potential side effects of the medication, competency of the UAP, and availability of the school nurse for direction and supervision.</p>	<p>School district policies Delegation</p>	<p>II</p>	<p>5</p>	<p>C</p>
--	--	-----------------------	---	--	---	-----------	----------	----------

<p>31. McClanahan, R., Shannon, R.A., & Kahn, P. (2019). School health office management (pp. 888-908). In J. Selekman, R.A. Shannon, & C.F. Yonkaitis (Eds). School Nursing: A comprehensive text. F.A.Davis.</p>	<p>Reference book</p>	<p>Expert opinion</p>	<p>(S) School nurse specific</p> <p>(S) Provides exemplar forms</p> <p>(L) Evidence limited</p> <p>(L) Cites AAP, 2009; Maughan et al., 2017; and Davis-Alldritt et al. extensively.</p> <p>Notes: I suggest using the primary sources.</p>	<p>Recommendations: Medication administration policies should include confidentiality; medication orders; doses that exceed manufacturer guidelines; proper labeling; storage disposal and transportation of medication to and from school; documentation of administration; rescue and emergency medications; off-label and investigational drugs; prescription and OTC medication; Complementary and alternative medications; psychotropic and controlled substances.</p> <p>The rights must be upheld in schools: right student, medication, dose, time, route and documentation, assessment and evaluation of response, and health teaching for medication.</p> <p>Students may refuse medications if using sound judgment.</p> <p>Medications require written orders specifying name of student, medication, indication, dose, route and time from an authorized prescriber. If needed, information about safe administration should be included, such as adverse reactions, student disposition after administration.</p>	<p>School district policies</p>	<p>II</p>	<p>5</p>	<p>C</p>
---	-----------------------	-----------------------	---	---	---------------------------------	-----------	----------	----------

				<p>School nurses must contact the prescriber for clarification of needed information or changes in status.</p> <p>Parent written authorization should be required for any medication administration.</p> <p>Medication orders should be provided annually and with any changes.</p> <p>Stock medications if allowed by state regulations require provider standing orders and signed parent permission. Parents must be notified when stock medication is administered.</p> <p>Changes in medication orders may be allowed verbally if district policies and state regulations allow. Written orders must be provided within 48 hours.</p> <p>Medications should be delivered to the school by the parent in the original container labeled with the student's name, drug name, drug dosage, rout of administration, directions and interval for the drug, name of licensed prescriber, and pharmacy contact information and expiration date.</p>				
--	--	--	--	---	--	--	--	--

				<p>Only medications that must be given during the school day should be administered at school.</p> <p>Medication orders must be reviewed prior to each administration to insure the rights of medication administration. Medication should not be pre-poured for later administration or pre-poured for another to administer.</p> <p>Medication should be completed "on time" and documented promptly.</p> <p>Students should not receive the first dose of a medication at school.</p> <p>All medications except emergency rescue medications should be locked and restricted to specific school personnel. Cabinets should be securely mounted to a solid surface. Medication cabinets should have solid doors to prevent breaking and protect privacy.</p> <p>The temperature of refrigerators storing medication should be monitored. Refrigerators with medication should be locked. Medications should not be stored with food.</p>				
--	--	--	--	--	--	--	--	--

				<p>A system of tracking and counting medications should be established. Liquid medications should document number of doses and amount removed. Controlled medication should be counted upon receipt and after each dose. Use a two person medication count twice weekly.</p> <p>A system to prevent, minimize and remediate medication errors should be in place to promote a culture of safety. All medication errors should be reported and documented.</p> <p>Delegation to a UAP is a nursing decision if allowed by school district policy and state laws and regulations.</p> <p>The person who medication administration is delegated must agree to the task.</p> <p>UAPs require school nurse training and evaluation. School nurse provides ongoing monitoring of UAP performance. Use of skills checklists reduces risks of delegation.</p> <p>OTC policies must be aligned with state laws and regulations. Policies for prescribed medication apply to OTCs.</p>				
--	--	--	--	--	--	--	--	--

				<p>School physicians may write standing orders for OTCs if state laws and regulations allow. Parent authorization is required.</p> <p>School districts need clear policies on non-FDA approved medication for children and off-label uses or doses. Homeopathic and naturopathic complementary and alternative medications, oils, salves, and dietary supplements are not FDA approved. State law and school policy would determine if provider orders from homeopathic or naturopathic practitioners are accepted. Nurses must be able to determine the active ingredients, dose ranges, actions, therapeutic value and side effects of any medication administered. If that is not available, nurses may refuse to administer.</p> <p>Off-label medication if allowed by state law and school policy must be accompanied by drug information that supports clinical decision making. Experimental medication for students in clinical trials requires communication with administrators, providers and parents to assure the nurse has the information needed to administer safely.</p>				
--	--	--	--	---	--	--	--	--

				<p>District policy and state laws must be consulted before administering medical marijuana at school. At this time, research is needed to determine safety in children.</p> <p>Life saving and rescue medications must be accompanied by an Emergency Action Plan. Adequate supplies of emergency medication must be available and accessible. Standing orders are required for stock emergency medications. Policies and procedures are needed for stock emergency medication to specify who may administer and when they are used.</p> <p>Self-administration of medication is guided by state laws and regulations and school policies. Responsible students should be allowed to carry rescue and emergency medication. Controlled substances and those at risk for abuse are not appropriate for self-carrying. The school nurse should assess competency and perform periodic monitoring.</p>				
--	--	--	--	---	--	--	--	--

				<p>If an unlicensed person is giving medication on a field trip, the nurse assures that the person has the medication, the schedule, training on administration, and a documentation method.</p> <p>Self-carry may be an option if the student is responsible and demonstrates proper use.</p> <p>Errors must be reported and non-punitive culture of safety should be fostered. Students who do not report to the office for medication should be located. Reminders should be instituted by partnering with teachers and other personnel.</p> <p>Medications ordered every 4 hours or less are to be given within 30 minutes of scheduled time. If they are less frequent than every four hours, medication may be administered within an hour of scheduled time (ISMP, 2011).</p> <p>Unused medication should be returned to parents at the end of year, upon transfer to another school or if medication is discontinued. The return should be documented, dated, timed and signed by the nurse and the parent.</p>				
--	--	--	--	---	--	--	--	--

				<p>If they cannot be returned to the parents, communities (police, pharmacies, hospitals, clinics) run “take-back” programs to collect medications to be disposed.</p> <p>If take back programs are not available, discard medication with a witness by count, and record the number or volume of drug. Destroy the medication by placing in a sealable container and mix with water and coffee grounds or cat litter. Seal container and dispose in trash. Remove the label from the pharmacy drug container and discard. Document in the record that the medication was discarded. (ANA, 2010; UDDEA, 2018)</p>				
<p>32. National Association of School Nurses. (2017). Medication administration in schools (Position Statement). https://nasn.org/advocacy/professional-practice-documents/position-statements/ps-medication</p>	Position statement	Expert opinion	<p>(S) Developed by school nurse leaders</p> <p>(L) Evidence limited</p>	<p>Recommendations: -Provides a prescriptive list of policies (delegation, confidentiality, medication orders, dosages exceeding recommended dose, labeling, storage, disposal and transportation of medication, documentation of administration, rescue and emergency medications, off-label and investigative drugs, OTC, complementary and alternative medications, psychotropic and controlled substances)</p>	Medication policies	II	5	C

				<p>-Reviews of medication documentation and medication administration audits</p> <p>-School nurses should lead development, implementation, evaluation of medication policies and procedures at the school and district level; and train and supervise UAPs.</p>				
<p>33. National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2015a). Recommendations to enhance accuracy of administration of medications. Author. https://www.nccmerp.org/recommendations-enhance-accuracy-administration-medications</p>	<p>To enhance the accuracy of medication administration through technology</p>	<p>Expert Opinion</p>	<p>(S) NCCMERP is a multi-sector interdisciplinary non-profit dedicated to the prevention of medication errors and promoting medication safety.</p> <p>(L) Very hospital specific</p>	<p>Recommendations: Any order that is incomplete, illegible, or poses any concern should be clarified before administration by using an established process for resolving issues.</p> <p>The following checks are to be performed immediately before medication administration: the right medication, in the right dose, to the right person, by the right route, using the right dosage form, at the right time, for the right reason, with the right response, with both desired effect and potential adverse effects in mind, and with the right patient education and documentation.</p>	<p>Medication policies</p>	<p>II</p>	<p>4</p>	<p>C</p>

				<p>Provide employees with adequate training regarding medication administration devices and routinely monitor or verify that users of such devices demonstrate competency regarding the device's proper operation and limitations.</p> <p>All persons who administer medications have adequate and appropriate access to patient information— which includes medical history, known allergies, patient weight, diagnoses, list of current medications, laboratory data and treatment plan—as close to the point of use as possible to assess the appropriateness of administering the medication.</p> <p>A complete and accurate listing of all current medications and dosages is available during all transitions of care (e.g., admission into hospital, change in level of care, discharge, transfer of patients to new sites of care).</p> <p>All persons who administer medications have easily accessible product information as close to the point of use as possible and are knowledgeable about the following:</p>				
--	--	--	--	--	--	--	--	--

				<ul style="list-style-type: none"> -Indications for use of the medication as well as precautions and contraindications -The expected outcome from its use -Potential adverse drug effects and interactions with food or other medications -Actions to take when adverse drug effects or interactions occur -Storage requirements -Drug preparation requirements -Patient specific dosing guidelines <p>Healthcare professionals only administer medications that are properly labeled, and labels should be read during the following 3 steps in the administration process:</p> <ul style="list-style-type: none"> -When reaching for or preparing the medication -Immediately before administering the medication -When discarding the container or replacing unused medication it into its storage location. <p>-Ongoing patient monitoring should occur for the desired therapeutic effect(s) and for potential adverse drug effects.</p> <p>The role of the work environment is considered when assessing safety of</p>				
--	--	--	--	--	--	--	--	--

				<p>the drug administration process. Factors such as lighting, temperature control, noise level, and potential for distractions (e.g., telephone and personal interruptions, performance of unrelated tasks, and others) should be examined. Sufficient staffing and other resources must be provided for the given workload.</p> <p>Data regarding the actual and potential errors of administration should be collected and analyzed for the purpose of continuous quality improvement.</p> <p>Conduct both initial and ongoing training of staff—including licensed staff, support/non-licensed staff, and relief staff—on accepted standards of practice related to accurate medication administration with the ultimate goal of medication error reduction.</p> <p>Every organization shall establish policies and procedures for the medication administration process. This will ensure that all personnel—including licensed staff, support/non-licensed staff, and relief staff—are informed of all possible outcomes related to the medication administration process.</p>				
--	--	--	--	---	--	--	--	--

<p>34. National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2015b). Recommendations to reduce medication errors associated with verbal medication orders and prescriptions. Author. https://www.nccmerp.org/recommendations-reduce-medication-errors-associated-verbal-medication-orders-and-prescriptions</p>	<p>To suggest recommendations to reduce errors associated with verbal prescription medication orders</p>	<p>Expert opinion</p>	<p>(S) Specific language suggested for policies</p> <p>(L) Not specific to school settings</p>	<p>Verbal communication of prescription or medication orders should be limited to urgent situations where immediate written or electronic communication is not feasible.</p> <p>Policies and procedures should</p> <ul style="list-style-type: none"> - Describe limitations or prohibitions on use of verbal orders. -Provide a mechanism to ensure validity/authenticity of the prescriber. -List the elements required for inclusion in a complete verbal order. -Describe situations in which verbal orders may be used. -List and define the individuals who may send and receive verbal orders. -Provide guidelines for clear and effective communication of verbal orders. -Employ read-back techniques for clarifying verbal orders. -Questions about verbal orders should be resolved before the preparation, dispensing, or administration of the medication. 	<p>Medication policies</p>	<p>II</p>	<p>4</p>	<p>C</p>
---	--	-----------------------	--	---	----------------------------	-----------	----------	----------

				<p>Information that should be given in a verbal order include the following:</p> <ul style="list-style-type: none"> -Name of student -Age and weight of patient, when appropriate -Drug name -Dosage form (e.g., tablets, capsules, inhalants) -Exact strength, dose or concentration -Dose, frequency, and route (including the dose basis for pediatric patients) -Quantity and/or duration -Purpose or indication (unless disclosure is considered inappropriate by the prescriber) -Specific instructions for use -Name of prescriber—and telephone number, when appropriate -Name of individual transmitting the order, if different from the prescriber <p>The content of verbal orders should be clearly communicated:</p> <ul style="list-style-type: none"> -Name of the drug should be confirmed by one or more of the following: -Spelling -Providing both the brand and generic names of the medication 				
--	--	--	--	---	--	--	--	--

				<p>-Providing the indication for use</p> <p>-To avoid confusion with spoken numbers, a dose such as 50 mg should be dictated as “fifty milligrams...five zero milligrams” to distinguish from “fifteen milligrams...one five milligrams.”</p> <p>-To avoid confusion with drug-name modifiers, such as prefixes and suffixes, additional spelling-assistance methods should be used (e.g. S as in Sam, X as in X-ray).</p> <p>-Instructions for use should be provided without abbreviations. For example, “1 tab tid” should be communicated as, “Take/ give one tablet three times daily.”</p> <p>-The receiver of the order should write down the complete order, then read it back, and receive confirmation from the individual who gave the order except in situations such as a sterile environment and/ or emergencies when stating back the order (without writing the order down first) with subsequent confirmation is acceptable.</p> <p>-All verbal orders should be immediately written and signed by the individual receiving the order indicating the author of the order.</p>				
--	--	--	--	--	--	--	--	--

				-Verbal orders should be documented in the patient's medical record, reviewed, and countersigned or authenticated by the prescriber in accordance with organizational policy.				
35. National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP). (2007). Recommendations to reduce medication errors in non-health care settings. Author. https://www.nccmerp.org/recommendations-reduce-medication-errors-non-health-care-settings	National recommendations	Expert Opinion	(S) Specific to community settings, specifically includes schools (L) Evidence is limited.	<p>Recommendations:</p> <p>Where medications are stored and administered to individuals, written policies and procedures should address the following:</p> <p>Acquisition of medications (e.g., from parents, caregivers, pharmacies)</p> <p>Documentation of medication order from licensed practitioner when applicable</p> <p>Specification of which personnel are allowed access to medications and allowed to administer medications to students, clients or residents</p> <p>Labeling and packaging of medications managed for students, clients or residents</p> <p>Storage of medications, including medications that may require refrigeration</p> <p>Secure storage and accountability of controlled drugs</p>	School district policies	II	5	C

				<p>Limitations on the type(s) of medications permissible for use or storage in the organization</p> <p>Administration of medications (including double-checking by another staff person when feasible)</p> <p>Documentation of medication administration</p> <p>Documentation and reporting of medication errors and adverse drug reactions</p> <p>Disposition of medications that are no longer needed or in use</p> <p>Where medications are stored and administered, training should be provided to personnel with responsibilities related to medication management. The training should correspond to the written policies and procedures, and the person's scope of duties associated with medications.</p> <p>Where controlled medications are stored and/or administered, safeguards should be in place to prevent and detect theft and diversion of controlled drugs.</p>				
--	--	--	--	--	--	--	--	--

				<p>Encourage the reporting of medication errors to appropriate state and national medication error reporting programs. These medication error reports may be used to identify significant trends or patterns that can lead to improved quality and safety of health care, and to teach others how to prevent similar errors.</p> <p>When a medication error occurs, evaluate possible causes in order to improve the facility's system for medication management and to prevent future errors.</p>				
<p>36. National Council for Prescription Drug Programs (NCPDP). (2014). NCPDP recommendations and guidance for standardizing dosing recommendations on prescription container labels or oral liquid medications. Author. https://www.ncpdp.org/NCPDP/media/pdf/WhitePaper/DosingDesignations-OralLiquid-MedicationLabels_1.pdf?ext=.pdf</p>	<p>To provide recommendations and guidance for standardizing dosage designations (amount and volume) used on prescription container labels for oral liquid medications dispensed by community pharmacies</p>	<p>White paper</p>	<p>(S) Cited by the CDC</p> <p>(L) Specific to home administration and prescribers</p>	<p>Recommendations relevant to school administration: When transcribing the dose to the medication administration record, always use leading zeros before a decimal amount of less than one, and do not use trailing zeros after a decimal.</p>		<p>II</p>	<p>4</p>	<p>C</p>

<p>37. Phan, H., Butler, S. M., Tobison, J., Boucher, E. A., & Advocacy Committee of behalf of the Pediatric Pharmacy Association (2020). Medication use in schools. [Position statement]. <i>The Journal of Pediatric Pharmacology and Therapeutics</i>, 25(2), 163–166. https://doi-org.proxy.cc.uic.edu/10.5863/1551-6776-25.2.163</p>	<p>To support safe and effective medication in schools</p>	<p>Pediatric Pharmacy Association Position Statement</p>	<p>(S) Pediatric Pharmacy Association endorsement</p> <p>(L) Literature review is limited.</p>	<p>Recommendations: Comprehensive district policy that covers prescription, OTC, complementary and alternative, emergency, and off-label medications</p> <p>Policies should describe self-carry requirements.</p> <p>Policies should describe safe medication storage and disposal.</p> <p>There should be a timetable for Periodic review of medication administration records, effective communication of IHPs, school policies, and maintaining updated allergy and medications lists.</p> <p>Standardize documentation including consent forms from parents and guardians, forms for prescribers and the medication administration logs</p> <p>Individualized care plans should be completed for each student who requires medication. Schools should develop general action plans for common emergencies, anaphylaxis, asthma, hypoglycemia, opioid overdose and seizures.</p>	<p>Medication policies</p>	<p>II</p>	<p>5</p>	<p>C</p>
--	--	--	--	---	----------------------------	-----------	----------	----------

				<p>School administration should provide continuing education and competency evaluation for personnel who administer medication and who respond to emergencies. Training should be a collaboration of the school health staff and parent guardians. Training should include state delegation laws and scope of practice, school specific policies and procedures, general knowledge of common health conditions and pediatric emergencies. Continuing education and renewed competency recommended.</p> <p>Schools, parents/ caregivers, and healthcare professionals should establish partnerships with effective communication for safe and effective medication use in schools.</p> <p>Pharmacists should be familiar with laws and legislations regarding medication in school and advocate for safe and effective medication use in school policies and practices in local communities.</p>				
--	--	--	--	---	--	--	--	--

				School administrators should seek professional guidance from professional organizations, pediatric hospitals or colleges of medicine, pharmacy and nursing.				
38. Potter, P.A., Perry, A.G., Stockert, P. & Hall, A. (2020). <i>Fundamentals of Nursing</i> . Elsevier. (p.79)	Fundamentals of Nursing	Reference	(S) Standard fundamentals nursing text (L) Limited evidence	Standards for pediatric medication administration: - Many child dosages are based on mg/kg. Weigh the child using a kg scale to avoid miscalculations converting pounds to kg. -Estimate the dose prior to calculating. Compare the calculation to the estimate. -To determine the safe dose, calculate the doses over 24 hours.	Pediatric dosage calculation	I	5	B
39. Ryan, J.B., Katsiyannis, A., Losinski, M., Reed, R., & Ellis, C. (2014). Review of state medication policies/guidelines regarding psychotropic medications in public schools. <i>Journal of Child and Family Studies</i> , 23(4), 704–715. doi: 10.1007/s10826-013-9805-3	Determine currently established state medication policies or guidelines Determine whether these policies contained key elements	Review	(S) Thorough review (L) Limited to psychotropic medications (L) Not in standard searchable databases	Results: Results showed 48 states provided guidance related to the administration of medications to students, with slightly fewer (44) states discussing required documentation procedures. More than two-thirds (42) of the states addressed requirements for the safe and proper storage of medications, while slightly more than half of all states (31) provided guidance regarding training of unlicensed assistive personnel (e.g., secretaries) who administer medications to students.	School district policies	II	5	C

				<p>The least addressed component of state medication policies/ guidelines related to monitoring students for side effects. Only 15 states discussed procedures for monitoring and providing feedback to prescribing physicians regarding potential side effects.</p> <p>Results showed the vast majority of states (48) provided guidance related to the administration of medications to students, with slightly fewer (44) states discussing required documentation procedures. More than two-thirds (42) of the states addressed requirements for the safe and proper storage of medications, while slightly more than half of all states (31) provided guidance regarding training of unlicensed assistive personnel (e.g., secretaries) who administer medications to students. The least addressed component of state medication policies/ guidelines related to monitoring students for side effects. Only 15 states discussed procedures for monitoring and providing feedback to prescribing physicians regarding potential side effects.</p>				
--	--	--	--	--	--	--	--	--

				<p>Recommendations</p> <p>School personnel should share classroom-based observations with parents or guardians regarding a student's academic and functional performance, or behavior in the classroom or school related to the effects of prescription medication.</p> <p>Effective procedures require schools to determine student's need for administration of medication, supervise administration of medication, train designated school personnel to administer medication, and communicate with the health professional who prescribed the medication.</p> <p>Staff should be trained in documentation requirements, administering and storing medication, and monitoring for adverse side effects.</p> <p>Medications should be safely maintained and accounted for.</p> <p>Recommended (a) medications are delivered to the school in their original container by the parent with the insert containing medication guidelines included;</p>				
--	--	--	--	--	--	--	--	--

				<p>(b) medications are stored in a locked cabinet; (c) school nurse or physician reviews medication orders to ensure that the medication is appropriate for the student and dosages are within recommended ranges; (d) students received medication as prescribed; (e) established procedures for errors; (f) administration is documented; g) parents notified to renew supplies of medication.</p> <p>Students should not carry or self-administer psychotropic medications.</p> <p>The school should ensure that lines of communication are established with the provider.</p>				
<p>40. Toups, M.M., Press, V.G., & Volerman, A. (2018). National analysis of state health policies on students' right to self-carry and self-administer asthma inhalers at school. <i>Journal of School Health, 88</i>(10), 776-784. https://doi-org.proxy.cc.uic.edu/10.1111/josh.12681</p>	<p>Comprehensive review of 50 states and District of Columbia's laws and policies for the self-carry and administration of quick-relief asthma inhalers among children in prekindergarten through 12th grade</p>	<p>Policy Paper</p>	<p>(S) Comprehensive review</p>	<p>Results: All states permit students to carry and administer their inhalers at school.</p> <p>States differ in development and implementation of policies for asthma self-management at school.</p> <p>States' laws have nuances that create gray areas, increasing the potential of misinterpreted or incorrectly implemented policies for asthma self-management at school.</p>	<p>State level policies</p>	<p>I</p>	<p>3</p>	<p>C</p>

				<p>Children may not have immediate access to their inhaler for symptom management or in an emergency.</p> <p>Recommendations: State policymakers should reform current laws to remove barriers for students to carry and use inhalers at school.</p>				
<p>41. Walsh, K. E., Kaushal, R., & Chessare, J. B. (2005). How to avoid paediatric medication errors: A user's guide to the literature. <i>Archives of Disease in Childhood</i>, 90(7), 698–702. https://doi-org.proxy.cc.uic.edu/10.1136/adc.2003.048827</p>	<p>Understanding of medication errors and familiarity of the most common errors and prevention strategies</p>	<p>Literature review</p>	<p>(L) Paucity of studies of child medication errors</p> <p>Notes: Highlights children vulnerable to errors due to weight-based dosing and many concentrations of medications. Children cannot talk about side effects.</p>	<p>Results:</p> <ul style="list-style-type: none"> - Most common errors: under- and overdosing - Chart reviews find more errors in ordering than incident reports, but not good at detecting administration errors. - Administration errors are best detected by direct observation. - Direct observation is expensive. - Rates of prescribing errors range from 10–25% in the paucity of studies. - Death and injury more common in drugs with long half-lives: e.g. chloral hydrate, pentobarbital, chlorpromazine. - 60% of errors made by nurse. However, another study suggested nurses apt to report errors. Nurses catch errors made by pharmacists and prescribers – no one intercepted nurse errors before administration. 	<p>Medication errors</p> <p>Direct observation</p>	<p>II</p>	<p>4</p>	<p>B</p>

				<ul style="list-style-type: none"> - Half of at home overdosing deaths due to chronic paracetamol overdose - Physicians and nurses are unsure about what constitutes a medication error. <p>Recommendations (omitted hospital specific):</p> <ul style="list-style-type: none"> - Bar coding reduces wrong medication. Errors, in one study by 76%; missed dose errors by 70%. - Electronic medication records (no details) - Nurse double check provider orders and pharmacy dispensing (reduce the holes in the Swiss Cheese) - Education about what constitutes a medication error - Formalized medication training for error prevention - Change culture from blaming to vigilance. 				
--	--	--	--	---	--	--	--	--

<p>42. Wilt, L., & Foley, M. (2011). Delegation of glucagon(r) in the school setting: A comparison of state legislation. <i>The Journal of School Nursing, 27</i>(3), 185-196. https://doi-org.proxy.cc.uic.edu/10.1177/1059840511398240</p>	<p>This article explores Glucagon (®) Review of US delegation laws.</p> <p>Presents an argument against such delegation in states where nurse practice acts do not allow for delegation of medication to unlicensed assistive personnel</p>	<p>Policy paper</p>	<p>(S) National review</p> <p>(S) Comprehensive</p>	<p>Results:</p> <p>State boards of nursing and individual state legislatures differ greatly in the intricate wording of statutes, rules, and regulations, creating difficulty establishing an understanding of the laws and whether they violate state NPAs.</p> <p>Great deal of variation among the 50 states and the District of Columbia in what may be delegated and under what circumstances.</p> <p>Recommendations: School districts must develop policies and procedures related not only to routine medication administration in the school setting but especially related to delegating administration of emergency medications which are compliant with state laws and NPAs.</p> <p>Individuals who compose legislation and policies have no education, understanding of jurisdiction related to nursing practice and the laws governing practice.</p>	<p>State policies</p>	<p>I</p>	<p>4</p>	<p>C</p>
---	---	---------------------	---	--	-----------------------	----------	----------	----------

				<p>School nurses should serve as resources and be sought as consultants during the development of policies and legislations affecting practice.</p> <p>School nurses should be a member of the team to design, implement, and evaluate training programs.</p>				
--	--	--	--	---	--	--	--	--

**Grading the QUALITY of Evidence for
School Nursing EBP Clinical Guidelines**

<i>Quality</i>	<i>Descriptor</i>
I	Acceptable quality: No concerns
II	Limitations in quality: Minor flaws and inconsistencies in the evidence
III*	Major limitations in quality: Many flaws in the evidence
IV*	Not acceptable: Major flaws in the evidence

**Do not include sources of quality levels III and IV in the synthesis.*

**Grading the LEVEL of Evidence for
School Nursing EBP Clinical Guidelines**

<i>Level</i>	<i>Descriptor</i>
1	Evidence from systematic reviews, meta-analysis, evidence guidelines, and evidence summaries (expert panel recommendations)
2	Evidence obtained from well-designed RCTs
3	Evidence from well-designed, case-control and cohort studies and systematic reviews of descriptive and qualitative studies
4	Evidence from clinical research critiques, integrative literature reviews, practice guidelines, clinical reference texts, and legal mandates
5	Evidence from expert opinion, case reports, professional policy, or position paper

**Grading the STRENGTH of Recommendations for
School Nursing EBP Clinical Guidelines**

	<i>Strength</i>	<i>Descriptor</i>
A	Strong Evidence	Based on consistent and good quality evidence; has relevance and applicability to school nursing practice
B	Moderate Evidence	Based on evidence of moderate rigor or with minor inconsistencies in quality; has relevance and applicability to school nursing practice
C	Limited Evidence	Based on evidence that is limited, low level, or has major inconsistencies in quality; has relevance and applicability to school nursing practice
D	Insufficient Evidence	Insufficient or no evidence upon which to make a recommendation; based on traditional practice alone

**Do not include sources of Strength Level D in CPG Recommendations.*