

1998

## Medication Administration in Schools

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MEDICATION ADMINISTRATION IN SCHOOLS

By

Stephanie A. Painter

A THESIS

Submitted to  
Grand Valley State University  
in partial fulfillment to the requirements for the  
degree of

MASTER OF SCIENCE IN NURSING

Kirkhof School of Nursing

1998

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## ABSTRACT

### MEDICATION ADMINISTRATION IN SCHOOLS

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The purpose of this study was to describe current practice of medication administration to children during school attendance in a district in Michigan. Information was collected by an audit of the policy and procedure manuals and medication records to assess a number of variables. It was found that 213 doses of medications were administered in 8 schools (enrollment 6,000) on the day of the study. Most of these were administered by nurses (40.8%) and secretaries (12.2%). While 25 different medications were administered, the medication most frequently administered was methylphenidate (60%). Medications were administered orally, per inhaler, nebulizer, topically or injected. They were administered to 189 students ages 5-23 with a mean age of 10.81 years and a mode of 9 years.

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**Dedication**

**To Michael, Jonathan. Jordan. Taylor. Sam**

**Mom and Dad**

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## Acknowledgments

Thank you Cindy Coviak and Linda Scott for your assistance in this project. I have truly appreciated the time and ideas you have given to me as I wrote my thesis. Thank you for investing in me. Your advice and insight has been extremely valuable. I have learned a great deal. I have a tremendous amount of respect for both of you. You have been great mentors. Thank you for pressing me, provoking thought and providing resources to improve this research project. Thank you for encouraging me and advocating for me during some of the rough spots.

Thank you Mel Karnehm for your participation in this research project as an educator and administrator. Thank you also for your encouragement and support and commitment to care for children.

Thank you Laurene Venneman who provided expertise with the literature search. I have really appreciated your willingness to be helpful and admire you for your extensive knowledge of library science and computer searches.

A special thanks to Michael, my mom and Barb Goodsell for everything. I could not have done it alone.

Last but not least, thanks be to God for all He has done. I am truly thankful.

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## CHAPTER I

### INTRODUCTION

Every day children receive prescriptions from their licensed health care provider. Because these children typically spend almost half of their waking hours at school, this means that school personnel are often responsible for the administration of many of these medications. How significant is this request and are schools prepared to meet it? Three major forces impact medication administration in schools in Michigan. First, there is an increase in chronic diseases in children. Second, medical treatment plans have increased complexity, and there is an increase in the number and types of medications in use. Third, Michigan does not require schools to employ nurses, therefore medications are administered by various school personnel without any mandatory training or supervision by health professionals.

Reports of illnesses in children suggest that “the percentage of children with severe long term illnesses has approximately doubled in the past 2 decades” (Behrman, 1992, p. 91) and it is estimated that “10-15% of school aged children in the United States have chronic health conditions and 10% of those have complex or severe illnesses” (National Nursing Coalition for School Health, 1995. p. 374). “New technologies will probably improve the longevity of children who today die in the first 2

decades of life and significantly increase the total number of children with chronic conditions.” (Behrman, 1992, p. 91-92). Various chronic conditions have been reported in children (Behrman, 1992) and are reportedly encountered by school personnel caring for them at school (Bradford, Heald & Petrie, 1994, Graff & Ault, 1993, Williams & McCarthy, 1995). These chronic conditions are summarized in Table 1.

Table 1

Conditions in Children Reported by Various Authors

Condition	Behrman, 1992	Williams & McCarthy, 1995	Graff & Ault, 1993	Bradford, et al, 1994
Asthma	X	X	X	X
Heart disease	X	X	X	X
Seizures	X	X	X	X
Arthritis	X	X		X
Diabetes	X	X		X
Downs Syndrome	X			
Spina Bifida	X	X	X	X
Sickle cell	X	X	X	
Cystic fibrosis	X	X	X	X
Hemophilia	X	X		X
Cancers/leukemias	X		X	X
Renal failure/disease	X	X		X
Muscular dystrophy	X			X
Cerebral palsy		X	X	X
HIV/CMV		X	X	X
Herpes			X	
Brain/spinal cord injury			X	X
ADD		X		X
Mental illness				X

Note. Table compiled by reviewing those articles cited for conditions reported in children.

Medical treatment plans for children with chronic or episodic illnesses have increasing complexity. Medical regimens for children with asthma, diabetes, seizures, severe allergic reactions, and migraine headaches now include nebulizers, use of multiple inhalers based on peak flow measurement, insulin injections two to four times daily based on monitoring of blood glucose, and injections for migraine headaches or allergic reactions. Administration of medications by various routes is common. Some authors (National Association of State School Nurse Consultants, 1996; Michigan Nurses Association, 1993) have reported that changes in the health care system have allowed children, who had been cared for in the hospital because of complex medical problems or in institutions for the mentally ill, to live at home and attend school.

A plethora of medications are used in medical treatment. In 1987, a report by the Illinois Department of Public Health revealed that fifty-eight types of medication were administered to students attending school (Igoe, 1990). That study was reported ten years ago and more recent investigations are scarce. In addition, there is an increased use of medications to treat behavior and emotional problems. Some report that “the use of Ritalin and other prescription drugs for hyperactivity and attention deficit has more than doubled in the 1980s” (Weiss, 1989, p. 10). This increased utilization will likely continue as some physicians report that “stimulant medications ....remains by far the most effective therapy for treatment for ADHD at present” (Baren, 1994, p. 40) and “more than 65% of regular and special education teachers believed stimulants were useful.” (Niebuhr & Smith, 1993, p. 112).

The Rehabilitation Act of 1973, Section 504 mandates that individuals with handicaps in the United States must not be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance (Rehabilitation Act, 1973). Medications must be administered to children at school to comply with this act (Katsiyannis, 1994, p. 8). However, there are no federal requirements or a regulatory agency which defines standards for medication administration or which monitors medication administration to children at school. Different state departments have addressed this problem and have published guidelines for medication administration.

Guidelines and training manuals for administration of medications from various states were reviewed (Alabama State Department of Education & Alabama Department of Public Health, 1995; Colorado State Board of Nursing, 1997; Iowa Department of Education, 1995; Maryland State Department of Education & Department of Health and Mental Hygiene, 1995; Massachusetts Department of Public Health Bureau of Family and Community Health School Health Unit, 1994; Michigan Department of Education, 1996; National MCH Resource Center for Ensuring Adequate Preparation of Providers of Care, undated). These training manuals are used to provide the framework for educating school personnel to administer medications safely. Guidelines for administration of medications in Michigan were included in a November 1996 memo which was sent to local and intermediate school district superintendents by the Michigan Department of Education (Michigan Department of Education, 1996). These guidelines were not meant to be regulatory or mandatory, but were offered as recommendations. "About

half of all states require schools to offer school health nurse services” (Kolbe et al., 1995, p.342) but Michigan does not have this requirement. The Michigan State Board of Education rules mandate services to students but they do not require school districts in Michigan to employ a nurse to provide services. Surprisingly, they do not even mention nursing services in the rules for physically or otherwise health impaired students except to state that “paraprofessionals may be employed to serve the program and may be assigned by the teacher to assist a nurse in a supportive capacity” (Michigan State Board of Education, 1997, p. 32). The rules simply state a registered nurse shall be “reasonably available” for severely mentally impaired programs (Michigan State Board of Education, 1997, p. 30). They do not define what the nurses are to be available to do or who they should be available to. The Michigan School Code addresses the administration of medication to a pupil only in regard to liability of school employees (Michigan School Code, Section 380.1178). Because most schools do not have nurses on staff, the Public Health Code which regulates nursing practice in hospitals and clinics in Michigan, is not specifically applied.

Although the state of Michigan does not have established standards for school nursing care or medication supervision, various professional organizations including the American Academy of Pediatrics (1993), the National Association of School Nurses (1993), and a collaborative of the American Federation of Teachers, the Council for Exceptional Children, the National Association of School Nurses, and the National Education Association (1990), have developed guidelines and/or written position statements for medication administration. National guidelines for administration of

medications in schools were published in 1990 (Igoe, 1990). The American Nurses Association published Standards of School Nursing Practice last in 1983 and in Standard II: Program Management, the school nurse is charged to “consult with school administration to establish, review and revise policy and procedures for a comprehensive school health program: medication administration protocols” (American Nurses Association, 1983, p.4). This study reviewed policy and procedures in one district in compliance with this standard.

The purpose of this study was to describe current practice of medication administration to children during school attendance in a large urban school district in Michigan. Information collected from this large district gave a limited description of administration of medications to students at school in Michigan. It was essential to understand the frequency of medication administration and its complexity in order to estimate the magnitude of this task. Does it occur frequently enough to be considered further or be defined as a problem to be addressed by nurses and school administration? This study provided a cursory assessment of present practice in one district by evaluating policy, procedure, documentation, frequency of administration, and who was administering medications. This descriptive study provided basic information that was not presently available.



## CHAPTER 2

### CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW

#### Conceptual Framework

Imogene King's conceptual framework was used to guide this study. It is important to understand the goal of this framework and definitions of concepts related to health, health needs, and nursing in the context of systems. The goal of this systems framework for nursing is to help individuals or groups attain, maintain, and restore their health so they can function in their roles (King, 1981; Elberson, 1989). Health is defined as "dynamic life experiences of a human being, which implies continuous adjustment to stressors in the internal and external environment through optimum use of one's resources to achieve maximum potential for daily living" (King, 1981, p. 5). King described three fundamental health needs of human beings: (1) usable health information, (2) preventive care, and (3) care when they cannot help themselves (King, 1981).

Nursing is defined "as a process of action, reaction and interaction whereby nurse and client share information about their perceptions in the nursing situation. Through purposeful communication they identify specific goals, problems, or concerns. They explore means to achieve a goal and agree to means to the goal." (King, 1981, p.2) King also describes nurses as partners with physicians, families, and paramedical groups

in the coordination of a plan of health care for individuals and groups (King, 1981) and used a systems framework to explain the relationships.

King described three related systems: (a) personal systems, (b) interpersonal systems and (c) social systems. Individuals are called personal systems and need to be understood in terms of perception, self, body image, growth and development, time, and space (King, 1981). Two or more interacting individuals form an interacting system or interpersonal system. Concepts that help one understand interactions of human beings are (1) role, (2) interaction, (3) communication, (4) transaction, and (5) stress (King, 1981). Social systems are groups with common interests and goals. Concepts related to social system include organization, power, authority, status, decision making, and role (King, 1981). A social system utilizes structure to organize individuals, objects, and things to attain goals. "Structure provides for the allocation of resources to individuals in specific positions to enable them to perform functions in specific roles. Structure provides for information flow through communication channels for decision making" (King, 1989, p. 38-39).

King's (1981) conceptual framework was selected because it best described the role of the nurse within the school (social system). The school nurse assists children (personal system) to attain, maintain, and restore health in order to function in their roles. The nurse is to identify problems and concerns and partner with physicians, families, and paramedical groups (interpersonal systems) to coordinate a plan of health care for children. The nurse shares a common goal with the school (social system) and interacts

with others (interpersonal) within the social system to organize resources to enable children to achieve their maximum for daily living.

### Application of King's Conceptual Framework

King's conceptual framework for nursing was easily applied to the study of medication administration in schools. Some children require medications to function or achieve their "maximum potential for daily living" (King, 1981, p.5). They must fulfill their role as student and if they are unable to administer their own medications, they need "care when they cannot help themselves" (King, 1981, p. 8). Nurses must collect accurate information regarding medication administration to students in school. In this study data were collected that quantified the problems or concerns regarding medication administration. These valuable data were necessary to validate or disregard speculated problems with medication administration to students at school. This information will facilitate discussion with physicians, families, and school administrators that will enable them to set goals and coordinate a plan for health care which includes safe medication administration to students in school. King might conceptualize this as the social system providing the structure to accomplish the goal of safe administration of medications to students.

This study explored the three systems: personal, interpersonal, and social involved in medication administration to students at school. Variables studied that described the personal system included the name, route, and frequency of the medication to be administered, and the age of the person who is to receive the medication. These variables are critical in determining if the personal system (the child) is probably capable

of caring for themselves or if they are dependent upon the system (interpersonal and social) for their care. The interpersonal system which functions to help people attain, maintain, and restore their health, according to King's (1981) conceptual framework, is usually the person and the nurse. Because nurses are not necessarily administering medications, this study sought to discover who has assumed this "role" in schools. This study assessed the frequency of the need for administration of medication to students each day, the routes of administration and names of medications that are administered. These variables indicated the expectations of the time and knowledge required to administer medications. Are those who have assumed this duty likely to experience "stress" because the time and knowledge required are beyond their ability, therefore are unable to perform this function safely?

The school is a social system whose primary goal is to educate children. The social system (school district) provides the structure for allocation of resources and directs by written policies, procedures, and job descriptions which are used to communicate with those employed within the school district. The school district will be evaluated by examination of what is communicated in policies and procedures and what is documented related to medication administration.

## Literature Review

The need for medication administration and lack of school nurse services is widely reported by parents, students, teachers, pharmacists, school nurses, physicians, and health administrators. Various articles in Detroit News and Free Press (Guttman, October 1995), The MEA Voice (Needham, 1994), NEA Today (Thompson & West, 1996), and the Michigan Pharmacist (Mezwicki, 1997) reported concern related to administration of medications to students. Other articles in the Redbook (Boodman, 1995), USA Today (Ornstein, 1997), and The Journal of School Health (National Nursing Coalition for School Health, 1995; Passarelli, 1994) reported the need for school nurse services. An author in a journal for school principals questioned whether we were meeting the needs of disabled students in inclusive education (Westberg, 1996). This also related closely to administration of medications and the need for school nurse services.

Surveys of parents, students (Weathersby, Lobo & Williamson, 1995), school nurses, school health administrators (Davis, Freyer, White, & Iggoe, 1995), and hospital departments (Koenning, Benjamin, Todaro, Warren & Burns, 1995), reported the need for administration of medications to students at school. Yet, a study of public policy decisions for children with disabilities did not mention medication administration (Oberg, Bryant, & Bach, 1994). Nor did a report to create an agenda for school-based health promotion (Lavin, Shapiro, & Weill, 1992). Articles which described current health programs (Hacker, Fried, Babiouzan, & Roeber, 1994) or surveyed state

guidelines for school based health centers (Schlitt, Ricket, Montgomery, & Lear, 1995) did not mention the need for medications to be dispensed in schools. While parents, students, school nurses, and school health administrators seem to be aware of the need for medication administration, it appeared that those involved in the study and planning of public policy and school health programming may not be aware of this issue.

The need for medication administration and the lack of school nurse services has not been sufficiently examined by research. A review of the literature was done to locate previous research on medication administration. Very few studies of medication administration to students at school were found, and none of them addressed all the variables that were addressed in this study. A review of articles or previous research was reported in relation to the specific variables to be studied using Imogene King's (1981) conceptual framework.

### Personal System

A review of the literature was done to determine what others have learned about the characteristics of the child receiving the medications, such as age, name of medication, its frequency and route of administration. Only one study (Francis, Hemmat, Treloar & Yarandi, 1996) was located that described the characteristics of the child receiving medications. A survey was completed by the person who administered medication to children at 36 public schools and 6 private schools. Total enrollment for the schools was 28,134 students (Francis et. al., 1996). The authors reported that public school students received medications contained within 31 categories that included anesthetics, antacids, antiemetics, anticholinergics, antidiarrheals,

antiemetics/gastrointestinal stimulants, antifungals, antihistamines, antihypertensives, anti-infectives, antipsychotics, analgesics, antipyretics, bronchodilators, calcium channel blockers, antitussives/expectorants/decongestants, central nervous system stimulants, diuretics, electrolytes, vitamins, glucocorticoids, histamine antagonist, nonsteroidal anti-inflammatory, sedative hypnotics, antispasmodics, enzymes, aminoacid derivatives, hormonal agents, methylphenidate, other/unknown, and narcotic analgesics. Students in private schools received medications from 13 of these categories. The medication most frequently administered was methylphenidate, which is most frequently used to treat attention deficit disorder. Five hundred fifty-six children received 3,362 total doses of methylphenidate during one week. This constituted 53.9% of medications administered in the public schools and 56.8% of those in private schools (Francis et. al., 1996).

The study by Francis (1996) reported the distribution of those students receiving medications by school classification, (elementary, middle and high school). These were in contrast to those reported by the Illinois Department of Public Health in Igoe (1990). See Table 2.

Table 2

Percentages of Children Receiving Medications by School Levels

	Igoe, 1990	Francis et al. 1996	Francis et al. 1996
		Public Schools	Private Schools
Elementary students	25.0%	66.8%	75.5%
Middle school students	15.0%	21.5%	16.0%
High school students	55.0%	4.1%	6.8%

Note. Table compiled to present data collected in studies by Francis et al. (1996) and Igoe (1990)

Various routes of administration which might be utilized include oral, injected, Epi-pen, allergy kits, inhalation, rectal, bladder installation, and eye/ear drops (American Federation of Teachers et al., 1990). A study in which a 15 item questionnaire was mailed to all school nurses in Pennsylvania (N=1,934) with 964 returned (50%) reported different routes of administration (Bradford, Heald, & Petrie, 1994) that are summarized in Table 3. This study suggested that medications that are dispensed at school are often via oral or inhaled routes, but may also be administered through intramuscular injections, central lines or bladder instillation.



Table 3

Routes of Administration Reported by School Nurses

Route	Percent of Nurses Reporting this Activity
Inhalation therapy/treatment	89%
Oral medications	67%
Intramuscular medications	4%
Central venous line	2%
Catheter irrigation	1%

Note. Table compiled to present data from Bradford, Heald & Petrie, 1994.

It is a legal requirement that students must have access to their medications and care by reliable school personnel (Goldberg, 1990). A review of the literature revealed that various authors agreed that students may administer their own medications if it is established that the student is competent to do so (American Academy of Pediatrics, 1993; Igoe, 1990). Other authors (Goldberg, 1990 & Kemp, 1991) suggested that the nurse, physician or parent judge them to have the maturity to do so or require written parental consent and physician consent if it is a prescription medication (American Academy of Pediatrics, 1993).

Therefore, the child receiving medications may be any age. He/she is probably taking Ritalin, but may be taking any one of 31 different types of medications. The medication will most likely be administered orally or by inhalation, but may need to be delivered by another route, such as injection, bladder installation or intravenously.

Children may be able to self administer if competent to do so, but most children depend on persons within the school to administer their medications to them.

### Interpersonal System

Role. Various professional groups have published guidelines for medication administration and have made recommendations regarding who should administer medications and under what conditions. These recommendations were reviewed and studies were examined to ascertain who had been reported to administer medications to students.

Some authors stated that “the ideal situation, of course is to have all medication given by registered nurses” but acknowledged that “medications are often given by non-health professionals” (Francis et al., 1996, p. 358). The National Guidelines for Administration of Medications described who may administer medications and under what circumstance. They recommended that medications be dispensed by “a designated person who is trained and with ongoing supervision by an registered nurse” (Igoe, 1990, p. 40.) The Guidelines for Delineation of Roles and Responsibilities for Safe Delivery of Specialized Health Care in the School Setting also agreed that other school personnel may administer medications but suggested who may administer be determined by which route of administration is needed and then it must be under the supervision of a registered nurse. (American Federation of Teachers, Council for Exceptional Children, National Association of School Nurses, & National Education Association, 1990). The National Guidelines also suggested that medications which are to be administered intravenously, intramuscularly (except severe allergic reactions) and any medication which requires

blood pressure, pulse or clinical nursing judgment to determine medication dosage, should be administered by a registered nurse only (Igoe, 1990). The American Academy of Pediatrics recommended that “the administration of parenteral medications should always be supervised by appropriately trained health professionals” (American Academy of Pediatrics, 1993, p. 293.) but did not specify that these should be nurses.

A few recent studies (Bradford et al., 1994; Davis et. al., 1995; Fryer & Igoe, 1996; Jones & Clark, 1993) have reported who was administering medications in school. All of these used a survey or questionnaire to obtain information. These studies will be described in more detail in the next few paragraphs.

In addition to examining routes of medication administration, Bradford et. al. (1994) assessed who administered scheduled and emergency medications in the school nurse’s absence. The findings indicated that it is often the principal, secretary or health aide who administer medications in the school nurse’s absence (See Table 4).

Table 4

Persons Who Administer Medications in School Nurse’s Absence

	Scheduled medication	Emergency medication
Secretary	51%	16%
Principal	38%	28%
Health Aide	26%	18%
Teacher	14%	14%
Self administer	3%	4%

(Bradford et al., 1994)

Davis et al. (1995) performed a national survey of school nurses and school health administrators in 1,677 districts to provide information and insight into the functioning of the school health programs, as well as personnel and practices in local school systems. A systematic random sample of 10% of the nearly 16,000 school districts across the United States were surveyed. A total of 482 districts from 45 states responded, for a response rate of 28.8% . The authors reported 97.1% of districts were administering medications (Davis et al., 1995), but did not directly report who was providing this service. Administering medications were included in descriptions of services provided by school based health centers and school health assistants. Eighteen of the districts had school based health centers and 67% of school based health centers reported that they dispensed medications to students. Twenty-nine percent of districts reported that they had health assistants and 25.1% of them administered medications. This study did not report who was dispensing medications in the majority of these districts.

The Center for Disease Control performed a study of School Health Policies and Programs (SHPPS) in 1994 to “measure policies and programs at the state, district, school and classroom levels across multiple components of the school health program” (Kann et al., 1995, p.292). In this cross-sectional study, questionnaires were sent to the superintendent’s office of each state to survey policies and programs at the state level. Fifty-one state education agencies responded. Five-hundred-two districts were contacted by phone and they identified a contact person who served as the SHPPS coordinator for

data collection. The questionnaire was returned by 413 districts. A variety of staff administered medications (See Table 5.) These results indicated that medications were administered by non-health personnel about 50% of the time.

Table 5

SHHPS Report of Persons Administering Medications to Students at School

	Middle School	High School
School Nurses	44.0%	46.9%
Secretaries	63.4%	46.3%
Teachers	19.0%	13.8%
Self Administer	13.7%	23.0%

(Small et al., 1995, p.323)

Fryer and Igoe (1996) mailed a questionnaire to 16,667 districts in 45 states to study functions of school nurses and health assistants. They obtained responses from 482 school health service administrators. They reported that 85.9% of school nurses and 52.1% of health assistants/ clerks/paraprofessionals administer medications.

Jones (1993) studied one school district in a metropolitan area in the southwest which had 23,267 students in 27 schools and employed 12 nurses. A data collection sheet was filled out by the school nurse on every child seen in the nurses' office. A coded list was used to categorize activities. The school nurse reported administration of medication as an activity but the study did not report the frequency.

A one week study of whoever dispensed medication to children at the school in 36 public schools and 6 private schools was done by Francis et al. (1996). Principals located through county administrative personnel and the yellow pages were contacted individually and invited to participate in the study. The survey form collected demographic information (child's name, age, grade, gender, ethnicity) and medication information (name, dosage, days and times the medication was given). Copies of the survey were "distributed to all participating schools" (Francis et al., 1996, p. 356) and the person assigned to give medications to children was asked to fill in the survey form each time a child presented to receive medication. They reported that "school nurses in the county studied were not responsible for administration of medications to students outside of schools which served the special education population" (Francis et al., 1996, p.356.) and that "most medications were dispensed by non-health professionals assigned to that service by the school principal." (Francis et al., 1996, p.356). It was not at all clear how this conclusion was reached, since they did not collect or report data regarding who dispensed medications.

It has been proposed that it is ideal for medications to be delivered by a registered nurse (especially those intravenous or intramuscular medications or those requiring nursing judgment) but it appeared from this literature review that various school personnel are administering medications. These included school nurses, secretaries, principals, health aides/clerks or paraprofessionals, teachers, "self," and those working in school based health clinics. It was not possible to determine who is most often responsible for medication administration based on this review of the literature. Those

who reportedly administered medications to students may do it once a semester or a hundred times a day.

Time. The person administering the medication and the student receiving the medication must meet briefly each time a medication is dispensed. Measuring the frequency of these interactions will enable one to understand the time demanded of those who assume this task as part of their role. One author stated that “an elementary school of 500 will typically have 20-25 children receiving medications each day...in 1973, the number would have been 0-5” (Newton, 1996, p. 59). These 20-25 children could also need medications more than once during the day.

A review of published articles and research was completed to investigate the frequency of medication administration to students in school. Only one recent research project (Jones & Clark, 1993) was located that described the frequency of medication administration to students in school. It was reported that in one week there were 2,300 student visits to the nurse and 1,379 of those were for medications (Jones & Clark, 1993).

The frequency of medication administration is an important factor that has not been researched adequately and impacts the person who has been asked to perform this task. This task can be a significant stress if it requires a large amount of time and stress is increased if this task requires increased knowledge.

Stress-cognition. Persons administering medications to students need to be knowledgeable regarding administration of medications but the amount of knowledge required is yet to be determined. The American Federation of Teachers (1992) recommended that staff should be trained in appropriate procedures and that a routine

assessment be performed to determine an individual's ability to perform procedures safely. The national guidelines for safe administration of medications suggested that training should "provide the participants in this course with the basic knowledge of pharmacology and medication administration, in order to safely administer medications in school or monitor the student in self-administration of oral, topical and inhalant medications" (Igoe, 1990, p. 44). The Office of Civil Rights requires schools to provide personnel to assist students in receiving medications who are trained regarding the district policy and procedures for administration of medications (Zaiger, undated).

Michigan does not require training and no training manual has been published at this time. However, manuals for training school personnel in administration of medications have been published by various states, including Louisiana (National Maternal Child Health Resource Center for Ensuring Adequate Preparation of Providers of Care, Undated), Colorado (Colorado State Board of Nursing, 1997), and Iowa (Iowa Department of Education, 1995). The content of training required in these states was remarkably similar. (See Table 6).



Table 6

Content of State Required Training to Administer Medications to Students in School

	Louisiana Training	Colorado Training	Iowa Training
Legal Information	X	X	X
Role/responsibility	X	X	X
Purpose of medications		X	X
Documentation	X	X	X
Guidelines-Rights	X	X	X
How to administer -including routes	X	X	X
Written Test		X	X
Skills checklist	X		X

Note. Table compiled by reviewing the content of training manuals. These are included in Reference list.

These state training manuals suggested that persons administering medications need a knowledge of procedures, pharmacology, and purpose of medications. They also need to know how to administer medications via oral, topical, and inhaled routes. Persons administering medications need to understand the legal parameters and document medication administration properly. This training was subscribed by some states who may also require a written or skills test. Unfortunately, no research was found related to training or education of non-nurses to administer medications to students or to

the outcomes of such training. Training is an important issue to be considered if medications are administered by non-nurses, and in terms of the application of the concepts of King's (1981) framework, is related to policy, procedure, and documentation requirements of the social system.

### Social System

Communication. Policies, procedures, and documentation are used to communicate within a social system. Policies should guide administration of medications. Several articles and a limited number of research studies were located which addressed the issue of school policies related to administration of medications to children at school. The task force for the medically fragile child in the school setting from the American Federation of Teachers (1992) recommended that there be a policy/procedure manual that is updated regularly. The purpose suggested for clear, comprehensive, non-restrictive policies and procedures was to provide protection to both the child receiving the medication and the individual (and by extension, the school) giving the medication (Francis et. al., 1996).

Different authors suggested content for policies (American Academy of Pediatrics, 1993; Igoe, 1990; Zaiger, undated) and these are compared in Table 7. These recommendations by nurses and physicians were remarkably similar. They all suggested written authority by a legal prescriber should contain the name of the drug, the dosage, the time interval, and possible reactions to the medication. In addition, all recommended that documentation should include the student's name, the medication dose, and time to be administered. Furthermore, medications should be locked up for storage and should

be brought to school in the original prescription bottle. The American Academy of Pediatrics (AAP) recommended in addition that a written consent from the parent should be required and that documentation should require the students' birthdate, medical diagnosis, handling instructions, the physician's address, and how to contact him/her. The AAP also recommended that the policy or procedure contain information on transportation of medication and directions for self administration.

Few studies were found which assessed the presence and content of state and local district policies related to administration of medication to students in school. In a national study, 1,677 school districts were surveyed and 482 respondents (school nurses and school health administrators) from 45 states replied. The researchers reported that 99.1% of the responding districts had a policy for administration of prescription medication and 93.6% had a policy for administering over the counter medication (Davis et. al., 1995).

Table 7

Recommendations for Medication Policy and Procedure by Different Authors.

	Igoe, 1990	American Academy of Pediatrics, 1993	Zaiger, undated
Written authority requirements			
By legal prescriber	X	X	X
Parent request/consent		X	
Contains Name of drug	X	X	X
Contains Dosage	X	X	X
Contains route to be given	X		
Prescribes time interval	X	X	X
States reason for medication	X	X	
Lists possible medicine reactions or side effects	X	X	X
Designates activity limits	X		
Informs of date to begin/end.		X	X
Documentation			
Contains student name	X	X	X
Contains student birthdate		X	
States medical diagnosis		X	
Records medication name		X	
Records medication dose	X	X	X
Records time administered	X	X	X
Records name of person administering	X		X
Gives handling instructions		X	
Gives physician address		X	
Method to reach physician		X	
Store locked	X	X	X
Original prescription bottle	X	X	X
Transportation of medication		X	X
Self administration		X	X
Training student and staff			X
Medication errors			X

A second study examining policies related to medication administration was the SHPPS study (1995). Information regarding state, district and school policies or procedures related to administration of medications at school was compiled and reported in Table 8.

Table 8

Policies Related to Administration of Medications as Reported in School Health Policies and Programs Study

Data collected in SHPPS	States	Districts	Schools
Require documentation before medication may be given to students.	60.8%	97.2%	89.4%
Require Medication administration direction records to be kept on file.	21.6%	69.0%	83.3%
Require written request from parents/guardians		90.2%	81.0 % * 71.7% **
Require written instructions about the medication from a physician or other authorized prescriber.		81.7%	74.0% * 68.1% **
Have a policy regarding medicines students are permitted to carry in school.	31.4%	88.5%	79.0%***

Note. Table compiled using data reported in SHHP study. (Small et al, 1995, p.321-324.) \*Middle School \*\* High School \*\*\*May carry own medications.

This review suggested that the vast majority of states and districts have a policy and procedure for medication administration which follows the AAP recommendations. They require written authority from a parent/guardian and physician. They also require

documentation of medication administration. The content of these records should include the student name, birthdate, medical diagnosis, name of medication, dosage, time to be administered and should record the name of the person administering. They might also include handling instructions, the physician's address and how to reach the doctor if needed.

Authority. Delegation is the transfer of responsibility for the performance of an activity from one individual to another while retaining accountability for the outcome (American Nurses Association, 1994). The National Guidelines for Administration of Medications suggested that medication administration should be done with ongoing supervision by a registered nurse (Igoe, 1990). This position is supported by several professional organizations (American Federation of Teachers Council for Exceptional Children, National Association of School Nurses, & National Education Association, 1990; National Association of State School Nurse Consultants, 1996; Newton, 1996). The American Academy of Pediatrics, Committee on School Health (1993) suggested that "designated personnel must be available to administer medications" and that "alternate personnel must know that they have been designated as responsible for supervising the administration of medication and must receive appropriate preparation and determination of capability" ( p. 293.) They caution that "the school should consider the frequency of administration and the degree of risk associated with medications in order to require a school nurse on location to supervise the administration of the medication" (American Academy of Pediatrics, 1993, p.293.) Despite these

recommendations, one author suggested that it was actually the school principal who was often the one who assigns medication administration to school staff (Francis et al., 1996).

### Summary and Implications for Study

It is a legal requirement that students will have access to their medications during school. This review of the literature revealed that there was a concern related to administration of medications to students at school and lack of nursing services, but limited research in this area has been reported. The child receiving medications may be any age and may receive medications from various routes. Most medications were dispensed orally or per inhalation. Ritalin was the medication that was required the most often.

The frequency of the request for medications to be administered has not been studied and is unknown. The person administering medications may be a nurse, secretary, principal, health aide/clerk, teacher paraprofessional, person employed in a school based health center or self. Some states required persons administering medications to be trained and various states or professional organizations have published similar guidelines or training to guide this procedure. The Center for Disease Control has done an extensive study which included questions related to policies and procedures. This study revealed that most states and districts have policies and procedures for medication administration (Small et al., 1995). These may designate authority for medication administration and often require documentation.

There were very few research studies which adequately described this problem. Most studies have been done using a survey or questionnaire and none of them addressed

all the variables which were assessed in this study. This study described the current practice of medication administration in schools by assessing variables using an audit of the policy and procedure and medication records. The focus was to assess the frequency and complexity of the need for medication administration to students and determine who has been assigned this role. The variables to be studied are defined in detail in the following section.

### Definition of Terms

Student. Person aged 5-26 years old enrolled in school. The student receiving medications was assigned an identification number to preserve anonymity.

Frequency. The number of times per day a medication was scheduled to be administered at school.

Routes of administration. The modes by which medications may be administered. This was one of the following (a) oral (b) inhaled (c) nebulized (d) otically (e) optically (f) topically (g) intramuscular or subcutaneous injection (h) intravenously (i) rectally (j) gastrostomy or feeding tube.

Name of medication. The accepted generic name for medications that students receive were listed from auditing medication records.

Age of student. Age in years as of last birthday. Age in years was calculated from the birth date located on the medication record.

Who is administering medications. The person logged as the individual responsible for medication to be delivered to student.



Job classification. Role of persons administering medications as classified by job designation.

Policies for medication administration. A written plan or course of action for medication administration by school district.

Procedures for medication administration. A written description of how medications were to be administered and documented.

Training. To educate about medication administration.

School classification. Schools were classified as either elementary, middle or high school as determined by level of instruction at a school based on student age and development.

Documentation of medication administration. Written records of medication administration.

### Research Questions

The associated research questions were: (a) Does the district have policies and procedures to direct who administers medications? (b) Does the policy or procedure prescribe how medications are to be administered and documented? (c) Do the records contain essential information, such as the medications' name, route of the medication, and the time and identity of the person who administered the medication? (d) How frequently does medication administration occur? (e) What are the names and routes of medications that are given? (f) Who is administering them? and (g) How many and what age of students are receiving medications?

## CHAPTER 3

### METHODS

#### Design

This study described current practice of medication administration to children in kindergarten through twelfth grade, in regular education sites during school attendance, in a large urban school district in Michigan. Information was collected by an audit of the policy and procedure manuals and medication records to assess a number of variables. The variables studied included: (a) the presence of district policies and procedures which direct medication administration and its documentation; (b) the presence of documentation of name, route, time and initials of person administering medication; (c) the frequency of medication administration per day (per student, per person administering, per building, per 100 students); (d) the names of medications that are given; (e) the job classification of persons who administered medications to students; (f) the routes of administration of medications prescribed; and (g) the number and ages of students who were to receive medications.

This retrospective study used a non-experimental design. This design was selected in order to describe medication administration as it naturally occurs. None of the variables or factors were controlled. A review of policies using categorical questions and an audit of medication documentation provided a structure that was objective and specific. Previous studies of medication administration used questionnaires or surveys, but an audit of medication records enabled a more structured method to collect data. It

was objectively collected and subjects were unable to qualify their answers. Data were collected unobtrusively and could be quantified.

A concern was that this study may underreport the scope of the problem as medications were not consistently documented. Medications may not have been documented for students who just took them intermittently or if students “self-administered” and failed to inform the school. A few copies of medication records may have been missing from the file in the student services office, so these may not have been retrievable for data collection. If an entire file of records were missing, another school was to be selected for review but this was not necessary. Concerns with documentation are not limited to this study. It’s an issue common to retrospective studies in general.

### Sample and Setting

This urban district had a total enrollment of approximately 25,000 students in 73 schools. There were 52 elementary schools with approximately 16,000 students enrolled. There were five middle schools with approximately 3,500 students and four high schools with approximately 5,000 students enrolled. There were twelve other sites which house unique programs but were not included in this study because of their small student enrollment and nonrepresentation of the district.

Factors that influenced the occurrence of medication requests were not known but because ethnicity and socioeconomic status may affect the frequency of the request for medication administration, the demographic characteristics of the buildings studied were

reported with the results of this study. The district's ethnic make up and percentage of students from low income backgrounds are reported in Table 9.

Table 9.

Demographic Summary of the District.

	Native American	African American	Asian	White	Hispanic	Percent from low income
Elementary	1%	41%	2%	40%	16%	65%
Middle	1%	43%	2%	38%	15%	65%
High School	1%	42%	2%	44%	11%	42%

Note. These were compiled from a profile of the district published by the district in 1996-1997.

Data were collected using a convenience sample. The population included 6,200 students in eight schools. Schools were separated into strata based on school type (elementary, middle school, or high school). Four elementary schools, two middle schools and two high schools were selected. To increase the sample size, the largest schools in each strata were selected for the audit of medication records. If medication records for buildings selected for study were missing then, the next largest school in the strata was selected for audit. The demographic summary of each school selected is reported in Appendix A.

The level of nursing services for administration of medications varied depending on funding. All schools in the district received the equivalent to one day per month of nursing time to organize administration of medications. Some schools received

additional services which were funded through grants or site-based budgets and the amount of services varied considerably. Some schools simply had the minimum, while others had budgeted for a full-time professional nurse. A grant provided funding for one school-based health center that was located in one building. Another grant provided funding for a health aide under the supervision of a registered nurse to be in five elementary schools.

### Instruments

Two methods were used to collect data by the reviewer. A form was used to audit the district policy and procedure. The parameters assessed are listed in Appendix B. Another form was used to record information garnered from medication records (Appendix C).

Reliability of the auditor in obtaining the data from school records was assessed through interrater reliability procedures. Data from ten records were collected and recorded on the appropriate records by the researcher. A second reviewer then audited these same records. There was a 100% reliability in transcription of data collected by the researcher. Reliability was also confirmed by test-retest procedures in which data from ten records were collected by the researcher and then collected again a week later. Again, there was a 100% reliability in transcription of data.

### Procedure

The district policy and procedure manual was reviewed to evaluate the presence of policies and procedures related to medication administration. A form was used to assess the policy (see Appendix B).

A copy of medication sheets on all students who received medications from September 1997 to June 1998 were submitted to the School Health Programming office by the school nurse responsible for supervision of medication administration. Medication sheets were stored in a file by school year and by school building. Medication sheets were retrieved for those schools selected for the study. Identification numbers were assigned to each student, school, persons signing medication forms, and names of medications. The age of the student was calculated from the birth date listed on medication record. Numeric codes were used to explain school classification, route of administration, and job classification of persons administering. After the codes were entered, the name of the student, the school name and the name of the person administering medications were deleted to assure confidentiality. Information from these records using the appropriate numeric codes was transferred into the Statistical Package for the Social Sciences (SPSS) for analysis and reporting. All forms used for data collection were then destroyed.

### Human Subjects

This was considered expedited research as it involved collection of existing data and was recorded in such a manner that subjects, the student, the person administering the medication, the school, and the district could not be identified. The district was asked for written permission to do the research utilizing the appropriate procedures they prescribed. The required procedures included: (a) the provision of the research design and instruments to the Director of Educational Research and Development Center; (b) a report of findings for the data obtained in an acceptable format to the Director of Educational Research and Development; (c) no data, articles or reports on this study were to be released by the researcher to parties internal or external to the district without prior written approval of the Director; (d) all activities of the researcher were in accordance with all federal, state and local school district guidelines for handling student data and protection of the rights and privacy of parents and students; and (e) the terms of this agreement were not modified except by mutual written agreement between the Educational Research and Development Center and the investigator. The researcher and the district signed a written contract which bound them to those procedures described previously. The agreement could have been terminated by either party upon thirty days of written notice to the other party. The research proposal was also reviewed by the human subjects committee at the university.

## CHAPTER 4

### RESULTS

Different methods for analysis were used to answer the research questions. The review of the policy and procedure manual was done and reported to answer the research questions related to medication policies and procedures. These questions were asked to ascertain the presence of policies and procedures related to medication administration. Descriptive statistical analyses were used using SPSS to answer the research questions. They were: (a) Do the records contain basic information like the name, and route of the medication, the time of administration, and who administered the medication? (b) How many and what age of children are receiving medications? (c) How frequently (per student, per person administering, per school, per school classification, per 100 students) does medication administration occur? (d) What are the names and routes of medications which are given? and (e) Who is administering them?

#### Policy Manual Review

The policy manual was reviewed. The manual contained a policy for administration of oral medications which was dated June 6, 1988. The policy required a written consent from the parent or guardian which contained instructions for administration of the medication. There were no procedures in the policy manual for administration of medications. The policy allowed students to carry medications with them at school if they had written permission from a parent or guardian. It did not limit what medications may be carried except that they could only carry one dose. The policy gave the principal the authority to administer medications or designate who was to



administer them. Unlicensed persons administering medications were not required to be trained.

#### Documentation Review

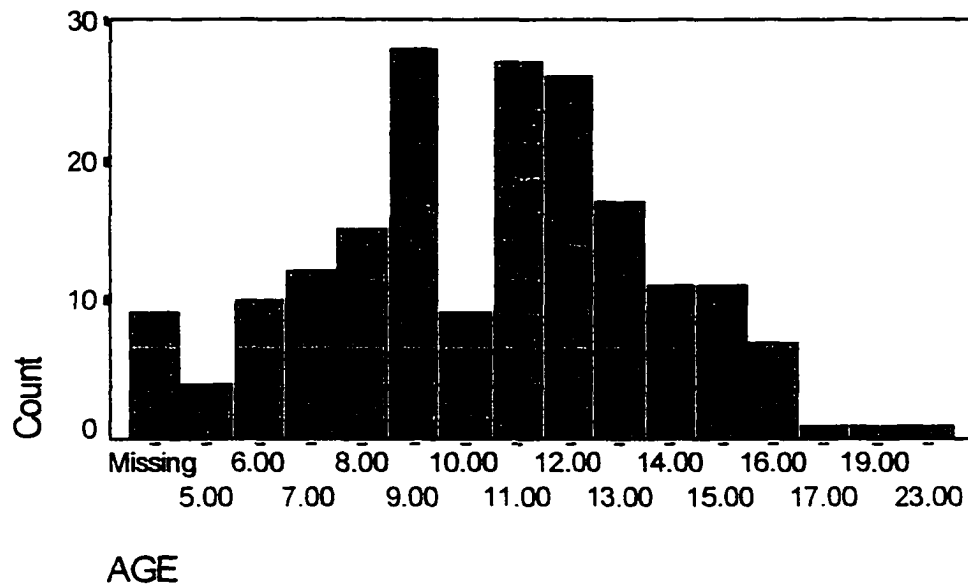
The total enrollment for the eight schools selected was 6,156 students. One hundred eighty nine student medication records from 8 schools (4 elementary, 2 middle schools, and 2 high schools) were located for audit for November 4, 1997. This date was selected because student enrollment was complete and most medications have been brought in by November. Two hundred thirteen doses were requested that day. An additional 54 medications were to be administered if needed. Documentation included the name of the medication and the time to be administered on those medications requested on a daily basis. The route to be administered was not consistently noted on the medication log but could be easily determined. One hundred sixty-five doses were documented as having been given. Eighty-three records (43.9%) did not report who administered the medication. Twenty-eight doses (13%) were documented with check marks as having been given, but the person who administered the medication was unidentifiable. There was nothing documented 55 times (25%) medications were to be administered.

#### Age of Students Taking Medications.

The ages of students receiving medications at school ranged from 5 to 23. The mean age of students receiving medications was 10.81 years (SD=3.01). The mode was 9 years of age. See Figure 1.

Figure 1

Age Distribution of Students Receiving Medications



Frequencies.

Totals. The percentage of students who needed medications during school hours ranged from 1 to 7% among elementary, middle and high schools (mean = 3.8%). Two hundred sixty-seven doses of medication were requested to be administered to 189 students. On a daily basis, 213 doses were requested, while 54 medications were to be administered if needed. On the date examined for this study, 7 of these “as needed” medications were actually administered. At least 17 staff participated in dispensing medications to students on the day of the study. See Table 10 for a summary of these frequencies.

School. Schools administered 16 to 61 doses (mean =33.3) of medication on the day reviewed. There were 10 to 44 students in each school who required medications. Each school had 2 to 5 staff who administered medications.

Table 10.

Summary of Medication Administration Frequencies by Building.

	Percent of enrollment on medications	Number of students taking medication/day.	Number of doses of medication dispensed/day.	Number of staff administering medications/day.
Elementary	2	10	16	2+
Elementary	7	29	36	2+
Elementary	7	44	61	2+
Elementary	3	12	17	2+
Middle School	5	37	54	5+
Middle School	3	26	41	2
High School	1	13	16	2
High School	1	18	26	Unknown
Totals	3.8 (mean)	189	267	17+

Note. Symbol (+) means that there were others who administered medications but they were unidentifiable on the record.

School classification. The frequency of the medications administered by school personnel to students during school hours was generally less for older students. Two to 7% of elementary students required this service. Three to 5% of middle school students

required medications and only 1% of high school students request this. For elementary students, 130 doses were administered to 95 elementary students. Ninety-five doses were administered to 63 middle school students and 42 doses were administered to 31 high school students. The distribution of students who required medications administered to them by school classification was that 50.3 % were elementary students, 33.3 % were middle school students and 16.4 % were high school students.

Student. One hundred twenty-three (65.1%) of students were to take one medication per day. Fifty-eight (30.7%) were to take two doses of a medication per day. Six (3.2%) were to take four doses of a medication per day and two (1.1%) were to take five doses of a medication per day.

Person administering. One person dispensed 65 doses to students in 2 schools in close proximity. Five staff members administered medications 5 to 10 times each and 9 staff administered medications once or twice on the day of review.

#### Medications Administered.

Twenty-five different medications were administered. The majority of medications requested included methylphenidate, albuterol, adderall, ibuprofen, cromolyn, epinephrine, valproic acid, and acetamenophen. Bupropion, pyridostigmine bromide, pancrelipase, pirbuterol, imipramine, clonidine, dextroamphetamine, triamcinolone, loratadine, beclamethasone, pemoline, mupirocin, diphenhydramine, prednisone, flunoxolide, propranolol and amlodipine besylate made up the remaining 14% of medications administered. See Table 11.

Table 11.

Medications Administered to Students.

Medication	By Percent
Methylphenidate	60.0%
Albuterol	13.0%
Adderall	6.0%
Ibuprofen	3.0%
Cromolyn	1.8%
Epinephrine	1.5%
Acetamenophen	1.0%
Valproic acid	1.0%
Bupropion	<1.0%
Pyridostigmine bromide	<1.0%
Pancrelipase	<1.0%
Pirbuterol	<1.0%
Imipramine	<1.0%
Clonidine	<1.0%
Dextroamphetamine	<1.0%
Triamcinolone	<1.0%
Loratadine	<1.0%
Beclamethasone	<1.0%
Pemoline	<1.0%
Mupirocin	<1.0%
Diphenhydramine	<1.0%
Prednisone	<1.0%
Flunoxolide	<1.0%
Propranolol	<1.0%
Amlodipine besylate	<1.0%

Some staff administered medication to only one student while others administered medications to all students in their building. One school had requests for 14 different medications while another site only administered 2 types of medication.

### Routes of Administration

Medications were requested to be administered via 5 different routes. Oral medications comprised 80% of those. Fifteen percent were inhaled via a multiple dose inhaler or rotocaps, with 2% delivered via nebulizer. Emergency medications to be administered via injection comprised 2% of needed medications. Less than 1% were to be administered topically.

Most (178) students required medications to be administered by one route. Ten students were to take medications by 2 routes. One student was to take medications using 3 different routes.

Medications were requested that had to be administered orally, per inhalation, topically, or per injection. Most schools were asked to administer medications via three different routes. See Table 12 for a summary of routes requested in each building.

Table 12.

Routes of Medications Administered.

	Oral	Inhaled	Nebulized	Topical	Injected
Elementary	X	X	X		
Elementary	X	X			X
Elementary	X	X			X
Elementary	X	X			
Middle School	X	X		X	
Middle school	X	X	X		
High School	X				
High School	X				

School Personnel Administering Medications.

Sixteen people were identified who administered these medications. Two to five staff members administered medications in each school. Various school personnel administered medications. Nurses administered medications most (40.8%), followed by secretaries (12.2%). Occasionally medications were administered by health aides (5.6%), teachers (1.4%), and paraprofessionals (.9%). Eighty-three records (38.9%) did not report who administered the medication. See Table 13.

Table 13.

School Personnel Administering Medications.

Personnel Administering Medications	Number of doses administered	Percent
Nurses	87	40.8
Secretaries	26	12.2
Health Aides	12	5.6
Teachers	3	1.4
Paraprofessionals	2	.9
Not recorded	83	38.9



## CHAPTER 5

### DISCUSSION AND IMPLICATIONS

This study provided additional insight that described the status of the practice of administration of medications to students at school. The characteristics of the child receiving the medications were reported. The job classification of those most often administering medications was identified. The knowledge required of the person administering the medication and time required of them was studied. The district policies and procedures were evaluated to ascertain what is communicated to guide those administering medications. This information will enable health professionals and school personnel to evaluate resources and organize them to assure that medications are administered safely.

#### Personal System

The child requiring medications at school was described. This study described the child receiving medications at school as between 5 and 23 years of age but most often 9 to 12 years of age. The child was probably taking methylphenidate, but may have been taking any of 25 different medications. Medication was most often administered orally (80%), but may have been delivered via inhaler (15 %) or nebulizer (2 %). Epinephrine may have been required via injection (2%) in an emergency. Most children (65.1%) needed to take medication once a day but some (1.1%) may have needed 5 doses of medication per day at school.

These results were similar to those reported by Francis et al. (1996). In both of these studies two to three percent of the enrollment needed various medications. Medications from several categories were administered but the predominant medication administered was methylphenidate. The distribution of students to receive medications by school classification (elementary, middle, high school) varied from what Francis et al. reported. Table 14 compares results for this study with those reported by Francis et al. Table 14.

Students Receiving Medication.

	Students on medications per enrollment	Medications	Distribution by school classification.	Predominant medication
Francis et al., 1996	556 of 28,134	31 categories	Elementary 66.8%* 75.5%**  Middle School 21.5%* 16%**  High School 4.1%* 6.8% **	Methylphenidate 53.9% * 56.8% **
Painter, 1998	189 of 6,156	21 categories	Elementary 50.3%  Middle School 33.3%  High School 16.4%	Methylphenidate 60%

Note. \*Public schools. \*\*Private schools.

According to King, the goal of nursing is to help individuals or groups attain, maintain and restore their health so they can function in their roles (Elberson, 1989; King, 1981) and they need care when they cannot help themselves (King, 1981). Children who are under 12 years of age, who are taking methylphenidate, using an inhaler or emergency injection, and expected to take medication more than once a day are probably not able to independently administer their own medication. They need these medications in order to maintain their health and to function in their roles educationally and socially. Therefore, they are dependent upon others to administer it to them while they are attending school.

#### Interpersonal System

Role. The job classification of those administering medications to students was not entirely clear from evaluating medication records. Eighty-three records (38.9%) did not report who administered the medication. This missing information could be explained in various ways. Some (28 doses of the 83) were documented with check marks as having been given but the person who administered them was unidentifiable. The remaining medications (55 doses) may have been administered but not documented. If these medications were actually administered but not documented, then a significant portion (30.9%) of the data are missing. It is also possible that medications may not have been administered. This could explain why no one could be identified who administered them. Medications would not be administered at school if the student was absent or would not be documented if the dose was missed. Of those documented, it appears that the majority of them have been administered by a nurse (40.8%), while some medications

may be administered by the secretary (12.2%), the health aide (5.6%), the teacher (1.4%), or a paraprofessional (0.9%).

This study supported existing research (Francis et al, 1996; Freyer & Igoe, 1996; & Small et al., 1995) which reported that various school personnel were administering medications. It also supported the study by Bradford et al (1994), that surveyed school nurses in Pennsylvania. As in that study, a major finding was that it is often the secretary who administers medications to students in the school nurse's absence, but others may also dispense medications. Bradford et al. reported that when the nurse is absent, scheduled medications may also be administered by the principal (38%), the health aide (26%), the teacher (14%) or the student may self-administer (3%). In this study, there were no records of medication administration by principals, and self-administration was not documented.

Various professional groups (American Federation of Teachers et al, 1990; American Federation of Teachers, 1992; & Igoe, 1990) suggest and some states (Colorado State Board of Nursing, 1997; Iowa Department of Education, 1995; & National Maternal Child Health Resource Center for Ensuring Adequate Preparation of Providers of Care, Undated), require that those administering medications should be trained to administer medications. This district did not require those administering medications to be trained.

There were 54 medications which were to be given to students "as needed." On the date of the study only 7 of them were administered. Those who administer these medications need to understand how to assess a child to determine if a medication is

needed and evaluate the action of the medication to determine its effectiveness. The National Guidelines for Administration of Medications suggest that medications which require clinical nursing judgement should be administered by a registered nurse only (Igoe, 1990). Since these persons administering medications were not required to be trained, it is difficult to understand how they knew whether medications were “needed.”

It can be assumed that the primary role of secretaries, principals, and teachers is not administering medications and that this task is in addition to many other responsibilities. The time required for this additional responsibility therefore needs to be considered.

Time. The time needed to dispense medications was measured by assessing the number of doses a person administered in a day. This measure made it difficult to relate to the study by Jones & Clark (1993) but the number of students in need of medication administration each day is close to Newton’s (1996) estimation of students receiving medications. Newton (1996) proposed that 20-25 students in an elementary school of 500 would receive medications each day. In this study it was discovered that in an elementary school of 400-600 students, 10-44 students (mean= 23.75) took 16-61 doses of medication per day (mean =32.5).

The time required for each person administering medications varied depending upon the number of persons per school who were sharing this task. At least seventeen people dispensed medications in eight schools on the date studied. Two to five people per building administered medications. Each interaction to administer medication took time. Each school organized resources differently to accomplish this task. Some

allocated one or two staff persons to administer medications to all students taking medications in their school. This meant that administering medications was a significant part of their responsibility and took a large part of their time. Others schools chose to have various staff administer medications to students. This meant that several staff had to spend little time and dispensing medications was a small portion of their responsibility.

There was nothing documented 55 times (25%) medications were to be administered. These scheduled interactions may not have occurred. It is possible that these doses were missed because someone forgot this job, lacked sufficient time to administer a medication or document it or that the student was absent and did not get the medication. Missing documentation creates additional problems if several people are administering medications. A medication could be administered by several staff to a student because they did not know it had already been administered.

Stress-cognition. Igoe (1990) recommends, and the Office of Civil Rights requires personnel who administer medications to be trained to administer medications. It has been suggested by Igoe (1990) that training include a basic knowledge of pharmacology and how to administer medications by different routes (oral, topical and inhalant). The Office of Civil Rights requires schools to train those administering medications regarding district policy and procedures. Various states have included pharmacology, legal information, role and responsibility of those administering medication, purpose of medications, documentation, and how to administer medications

in manuals they have published to train school personnel about medication administration. They also recommend a written test and skills checklist.

This study provided new insight into the variety of medications that are administered. Persons administering medications need pharmacology information about these medications and their purpose. They need to know how to administer them and properly document their administration. They need to know the state law and guidelines. According to this study, a person who administers medication in this district needs pharmacology information on one to fourteen (of twenty five) different medications and instruction on how to administer medications orally, inhaled per inhaler or nebulizer, topically, and per injection. This training was not required in the policy and procedure manual for the district studied.

#### Social System

Communication. Various authors (Igoe, 1990; Zaiger, undated) and professional organizations (American Academy of Pediatrics, 1993) suggested that school policy and procedure manuals require written authority by a legal prescriber, and that documentation should include the student's name, the medication dosage, and time to be administered. The SHPPS study (1995) reported that most states and districts have policies and procedures which follow these recommendations. This district had a medication policy, but it was written for administration of oral medications only. The policy required a written consent from the parent or guardian that also included instructions for administration of the medication. The medication was to be brought to school in the original container. The label on the container was considered the physician order

(direction) but the policy did not require medication administration directions to be kept on file. There were no procedures in the policy manual for administration of medications. The policy did require documentation of medication administration. The policy did not require unlicensed persons administering medications to be trained. The policy allowed students to carry medications with them at school and did not limit what medications may be carried. It required students to carry medication in labeled container and only allowed them to carry one days supply.

Authority. Various guidelines (Igoe, 1990) and professional organizations (American Federation of Teachers Council for Exceptional Children, National Association of School Nurses, & National Education Association, 1990; National Association of State School Nurse Consultants, 1996; Newton, 1996) have recommended that administration of medications be done under the supervision of a school nurse. Francis et al (1996) suggested that in actual practice, it was usually the school principal who assigned medication administration to school staff. This district policy gave the principal the authority to administer medications or designate who was to administer them. However, on the date of this study no principal administered medications.

#### Application to Practice

Information obtained from this study can be applied to nursing practice. The information regarding the personal system (the student), the interpersonal system (the student and the person administering the medication) and the social system (the district



and the state government) can assist in making recommendations specific to these systems.

These students, especially those 10-12 years of age need to be educated about the medications they are taking. Students need assistance in understanding why they are taking medications and how their medications work. The eventual goal is to educate students to be able to self-administer as soon as they are able. Since the majority of medications are being prescribed to treat attention deficit disorder and asthma, education programs can target these students with appropriate information.

School personnel who most frequently administer medications are the nurse, the secretary, the health aide and the teacher. Persons administering medications need training that assists them in developing a knowledge of procedures, pharmacology, and purpose of medications. They also need to be able to administer medications via oral, topical and inhaled routes. They should understand how and when to administer emergency medications via injection. Persons administering medications need to understand the legal parameters and document properly. This training should be evaluated by a written and/or skills test. Universities preparing nurses for practice should include practica in the schools and educate to prepare them for school nursing practice.

Districts like this one have chosen to assign this responsibility to the principal, but it is likely that the principal has never taken courses in pharmacology or medication administration. The Public Health Code which contains the nurse practice act should be applied to schools. If this code was applied to schools as it is to hospitals and nursing

homes, a principal would not be given this responsibility. Yet, there is an expectation principals and secretaries should function in schools as nurses do in other institutions. Administration of medications to children in schools is clearly nursing practice. A nurse is more knowledgeable about medications and their side effects and is most able to train and supervise those administering medications to perform this task safely.

The district policy needs to require those administering medications to be trained. It needs to be written to include a policy and procedure for administration of medications different routes. The policy or procedure should prescribe specific documentation for medications that are given regularly and in emergencies. The documentation should clearly report that a dose was missed and the reason for the omission (ie. absent or out of medications). Since several people are administering medications, it is possible that a student could be medicated twice if a dose was not documented.

Medications are administered frequently. This is an important task. There are safety and liability concerns. It would seem prudent to decide who will be administering medications and include this in their job description and evaluation. This would encourage those administering medications to recognize the importance of this responsibility.

It was recommended in the literature review that nurses administer medications or delegate this procedure. In this district, nurses did administer most of the medications. The policy did not require training for those administering medications. This would be most desirable. Those administering medications also need ongoing

supervision and assistance of a nurse to ensure that as needs and questions arise, they have support to do this safely. Nurses are also capable of providing quality assurance to assure that medications are administered safely and documented properly. As treatment modalities change, nurses are then ready to make modifications and educate staff about this as it occurs. Nurses can also develop methods to improve the quality of medication administration and its documentation.

The request for administration of medications occurs frequently enough to suggest that school nurses, physicians, parents, school administrators and those in state government need to develop a goal and a plan for safe administration of medication to students at school. This district had school nurses who assisted with administration of medications and coordination of this service. Michigan does not require school nursing services and therefore, many other districts do not have nurses to assist them in planning for safe dispensing of medications. The safety of administration of medication at school should be evaluated in these districts where nurses are not employed.

### Limitations

Information obtained in this study was collected by audits of documentation. Several medication logs had missing information and therefore these data could not be collected. A continued concern was that this study may have underreported the scope of the problem as medications were not consistently documented. Medications may not have been documented for students who took them intermittently. The need for the Epi-pen was not listed on the medication log but was documented on a separate sheet by the

nurse serving two schools. The other six schools did not have a list of students who might need emergency medications and there were no emergency medications listed on medication logs. These schools may have had students that needed emergency adrenalin or glucagon but did not document it since it was not given on a regular basis. Students who self-administered were not documented. Copies of medication records may have been missing from the file in the student services office, so these may not have been retrievable for data collection. Even if the results under-report the problem, this study gleaned valuable information.

#### Further Research

Replication or extension of this study is recommended. It would be helpful to compare it to another district in Michigan that does not employ nurses. It would also be interesting to complete a similar study in smaller schools (200-300) or in a district that is suburban or rural. Districts with students of a higher socioeconomic status would also be an interesting comparison regarding how many students are on medications and who is administering their medications.

Further research that measures the knowledge, perception, beliefs or function of the student receiving the medication would be interesting information. Do these affect administration of medications? A study of students taking methylphenidate which compared their functioning before and after medication would be helpful. Is there a relationship between missed doses and behavior referrals or school suspensions? Is there improved school performance if medications are administered as ordered?

Additional studies could measure the training, knowledge, beliefs, and perception of stress in those administering medications. Studies could evaluate the communication, interaction and transactions that occur between the student and the person administering medications.

Questions that districts might ask include: (1) What is the frequency of missed doses? (2) Why are doses missed? (3) What structure organizes resources to administer medications? (4) Is there a relationship between missed doses and the organization of resources to administer medications? (i.e. two staff administer medications to all students vs. many staff administer medications to one student.) (4) What factors influence the structure that organizes resources to administer medications? (5) How much time does it take to dispense a medication? (6) What are the other duties of the person administering medications? (7) Is administration of medications part of their job description? (8) Does the principal have the knowledge needed to assign and supervise those administering medications? Many relevant questions such as these could be answered by future research of medication administration since few studies have been done.

### Conclusion

The request for medications to be administered to children at school is significant and schools need to be better prepared to meet it. This study found that 3.8% of all students need medications administered to them during the day at school. Each school administered medications an average of 33.3 times per day. Twenty-five different medications were administered by 5 different routes. Some medications required the person administering them to determine if the medication was needed. This was true

with asthma or severe allergies. The child who needed medication was usually under 12 years of age and therefore was probably not capable of self-administration.

Schools need a clear and complete policy for medication administration. Resources need to be allocated to accomplish this task. Personnel administering medications need training and adequate supervision and support by school nurses. Since the request for various medications and routes vary and change intermittently, nurses need to be available to either administer the medications or inservice staff on new medication as they are requested.

“Achievement of organizational goals may require planning for change. This planning requires communication, collaboration and mutual goal setting to assure successful, satisfying change” (Elberson, 1989, p. 50). A school’s mission is to educate children to achieve their potential. Some of these children need medications in order to function in their role as student. This research provided information which is needed to plan for change to assure that medications are administered to students in a safe manner while they are attending school. Safe medication administration must be achieved. School districts, health care professionals and parents must take this information and develop a plan which utilizes appropriate resources to meet this demand.

## Appendix A

### Demographic Summary of each School

Type of School (ID)	Enrolled (nearest 100.)	Percent Native Amer.	Percent African Amer.	Percent Asian	Percent White	Percent Hispanic	Percent Low income
EL	500	2	15	1	8	75	85
EL	400	2	38	2	47	12	41
EL	600	4	6	1	73	17	70
EL*	500		92	1	2	6	90
MS	700	1	75	3	15	7	64
MS	800	2	12	2	52	31	70
HS	1200	1	67	2	27	4	34
HS	1500	1	15	2	61	20	44

Note. This school receives grant for health services.

## Appendix B

### Form to Audit Policy and Procedure Manual

	yes or no
1. Is there a policy for medication administration?	
2. Does the policy require documentation before medications may be given to students?	
3. Does the policy or procedure require medication administration directions be kept on file?	
4. Does the policy or procedure require a written request from parent or guardian?	
5. Does the policy or procedure define who administers medications?	
6. Does the procedure describe how medications are to be administered?	
7. Is there a procedure for administration of oral medications?	
8. Is there a procedure for administration of medications per MDI?	
9. Is there a procedure for administration of medications per nebulizer?	
10. Is there a procedure for administration of medications per otic?	
11. Is there a procedure for administration of medications per optic?	
12. Is there a procedure for administration of medications topically?	
13. Is there a procedure for administration of medications IM?	
14. Is there a procedure for administration of medications IV?	
15. Is there a procedure for administration of medications rectally?	
16. Is there a procedure for administration of medications via gastrostomy or feeding tube?	
17. Does the policy or procedure require unlicensed persons administering medications be trained?	
18. Does the policy or procedure allow students to carry medications with them at school?	
19. Does it limit what medications they may carry?	



Appendix C

Medication Record Audit Instrument.

Building Name \_\_\_\_\_ Building Classification \_\_\_\_\_

Name	BD	Med Name	Time	Route	Who	Job

Note. If a student takes more than one medication a day then it will be listed in next row.

## Appendix D

### Codes for Entry

ID. The student receiving medications will be assigned an identification number to preserve anonymity. Numbering will begin with one and extend until all students to receive medication are assigned.

Age. Age in years of student.

Building Code- Number assigned to a school site to maintain confidentiality

School classification. Schools will be classified as either 1-elementary, 2-middle or 3-high school.

Medication. Generic name for medications student receives will be listed from auditing medication records. As medications are encountered they will be assigned an identification number. If no name is recorded or is illegible, then it will be entered as 0.

Route. The ways medications may be administered. This will be recorded as one of the following 1. oral 2. inhaled 3. nebulizer 4. otic 5. optic 6. topical 7.IM/Sub Q 8. IV 9. rectal 10. gastrostomy or feeding tube 11. other 12. not recorded.

Time The time a medication is to be administered.

Who. The person administering the medication will be assigned an identification number.

Job. Persons administering medications will be classified by job designation. This may be designated as 1-School nurse, 2-principal, 3-secretary, 4-health aide, 5-teacher, 6-paraprofessional or non-certified, 7-self, 8-school based health center, 9-unknown.

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