

Pharmacotherapy Perspectives

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In this issue of *JPSW*, we present two installments of Pharmacotherapy Perspectives. The first article (below) is a comprehensive analysis of Wisconsin Act 77, which changes regulations governing asthma inhaler use in Wisconsin schools. In his editorial in the May/June issue of *JPSW*, Chris Decker noted that pharmacists are in a unique position to serve as expert resources in their communities, and challenged all of us to become more active in community service. The implementation of this new regulation provides Wisconsin pharmacists with a timely opportunity to do just that – by contributing to the health of asthmatic children. The following comprehensive summary of Act 77, written by Gretchen Manthei, includes a great deal of information that pharmacists can use to take an active role in the implementation of these new policies in their local school districts. A position statement issued by the University of Wisconsin Hospital and Clinics' Center for Drug Policy, supporting the full implementation of Act 77, is also included.

The second article in this issue (on page 33) is an update on the management of depression. A great deal of health care resources are currently being allocated to the management of mental health services, and specifically, to the treatment of

depression. In many managed care insurance organizations, the top pharmaceutical expenses are antidepressants, particularly those in the SSRI class. The focus of increasing health policy debate, access to mental health care (including pharmacotherapy) will likely increase in the future.

With these facts in mind, pharmacists have an opportunity to make contributions to the care of patients with depression in the same way we are improving the care of asthmatic and diabetic patients. As described in this summary, written by Nilay Shah, Tamara Eisner, Michelle Farrell, and Carla Raeder, pharmacists should be concerned about several aspects of antidepressant therapy, including the identification and management of drug-drug interactions and adverse drug reactions (including discontinuation syndrome), optimizing therapy through product selection, dosing adjustment, and length of therapy adjustment, and routine monitoring of specific treatment goals and outcomes. While disease management programs in mental health are not currently as popular as those in asthma or diabetes, the potential for pharmacists to make a substantial positive impact on the care of depressed patients is very similar. —Lee Vermeulen

Asthma Self-management in Wisconsin Schools

by Gretchen Manthei

Introduction

Asthma is a chronic, reversible lung disease that is characterized by inflammation, obstruction, and airway hyperresponsiveness.¹ An asthma attack commonly presents as wheezing, breathlessness, chest tightness, and coughing due to airway narrowing and inflammation from overreaction to a variety of triggers. Asthmatics' breathing problems are usually episodic; however, some degree of airway inflammation is usually continually present. Asthma attacks can be mild, moderate, or life-threatening. Proper treatment of asthma requires continuous medical care, which encompasses medications, measures of lung function, control of environmental triggers, and patient education. The two main classes of medications used to treat asthma are bronchodilators and anti-inflammatory agents, which are usually administered via inhalation. A patient whose asthma is properly managed will meet the five goals listed in table 1. An additional goal in the treatment of children with asthma is to foster emotional health so that the child thinks of himself as healthy, able to meet challenges, and able to succeed.²

The purpose of this article is to raise the awareness of

Table 1: Goals of Asthma Management

1. Maintain pulmonary function rates near normal
2. Maintain normal activity levels, including exercise
3. Prevent chronic symptoms (e.g., coughing or breathlessness)
4. Avoid adverse effects from asthma medications
5. Satisfaction with asthma care

Adapted from NHLBI Guidelines for the diagnosis and management of asthma: expert panel report 2. April 1997. U.S. Department of Health and Human Services, NIH Pub. No. 97-4051.

Wisconsin pharmacists to recent legislative actions that pertain to the use of asthma medications in schools. Included in this article is a summary of the legislative action, background information on the issues related to asthma self-management by school-age children, and a position statement encouraging pharmacists to take an active role in the implementation of the new regulations.

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The information given and views expressed herein do not necessarily reflect the opinions of PSW, its Board or members.

Epidemiology of Asthma in School-Age Children

Asthma is the leading chronic illness among children. In the United States nearly 5 million children (5 to 7% of the school-age population ages 5-18) have asthma.^{3,4} In Wisconsin, it has been estimated that 9% of school-age children have asthma.⁵ Exercise-induced asthma (EIA), a constriction of the airways induced *only* by physical activity, has been found to afflict nearly 100% of asthmatics, up to 35% of competitive athletes and 15% of other physically active children.^{6,7} The primary type of medications used to manage both asthma and EIA are bronchodilators administered by inhaler, thus greater than 5 to 7% of the school-age population require and use these medications to manage their disease.

Are Schools Asthma-Friendly?

For school-age children, treatment of asthma extends beyond home into school hours. In order for children to keep their asthma under control and yet lead active and normal lives, a supportive school environment is fundamental. The school asthma education subcommittee of the National Asthma Education and Prevention Program has created seven areas of concern to be raised when investigating whether a particular school is supportive of children managing their asthma (see table 2).⁸ Children may face obstacles to asthma management at school if any issues are identified in this checklist. If obstacles are noted, school boards, school staff, health professionals, and parents should work together to develop policies and procedures that make their schools more asthma-friendly, and to promote students' health. This discussion will focus on issue number four, student access to and use of medications in school.

Benefits of Optimizing Asthma Management in School-Aged Children

Poorly managed asthma in children has ramifications at school and beyond. Asthma is a leading cause of school absenteeism, accounting for 10 million lost school days annually.⁹ This is an average of 7.6 school days missed per year for an asthmatic child.¹⁰ In comparison, children without a current health condition are absent an average of just 2.5 days per year. Asthma also impedes students' participation and progress in school. In addition, asthma is the third-ranking cause of hospitalization among children under 15 years of age and accounts for almost 17% of pediatric emergency room visits.⁹ A severe asthma attack that is not treated can progress to a life-threatening attack in one hour.¹¹

Creating a positive and healthy learning environment at school requires the collaboration of the asthmatic child, family, health care providers, and school staff. The school staff, especially teachers and nurses, play an important role in the effective management of asthma at school. Effective asthma management at school has many benefits:^{12,13}

Table 2: How Asthma Friendly is Your School?

1. Is your school free of tobacco smoke all of the time, including during school-sponsored events?
2. Does the school maintain good indoor air quality? Does it reduce or eliminate allergens and irritants that can make asthma worse? Allergens and irritants include pets with fur or feathers; mold and dust mites found in carpets and upholstery; cockroaches; and strong odors or fumes from products such as pesticides, paint, perfumes, and cleaning chemicals.
3. Is a school nurse in your school all day, every day? If not, does the school have a regularly available nurse to help write plans and give guidance to students with asthma about medicines, physical education, and field trips?
4. Can children take medicines at school as recommended by their doctor and parents? May children carry their own asthma medicines?
5. Does your school have an emergency plan for taking care of a child with a severe asthma attack? Is it made clear what to do? Who to call? When to call?
6. Does someone teach school staff about asthma, asthma management plans, and asthma medicines? Does someone teach all students about asthma and how to help a classmate who has it?
7. Do students have good options for fully and safely participating in physical education class and recess? (For example, do students have access to their medicine before exercise? Can they choose modified or alternative activities when medically necessary?)

From: NHLBI National Asthma Education and Prevention Program: School Asthma Education Subcommittee. How asthma friendly is your school? *J Sch Health* 1998;68:167-8.

- Promotes a supportive learning environment for students with asthma;
 - Promotes optimal school performance by controlling symptoms, thereby reducing absences;
 - Reduces disruption in the classroom;
 - Provides the necessary support in the event of an emergency;
 - Permits students to achieve full participation in physical activities.
- Ways that schools can help students maintain control of their asthma have been identified:¹⁴
- Recognize asthma triggers for an individual student;
 - Avoid or control the recognized potential asthma triggers;
 - Follow an asthma management plan (including recognizing symptoms, taking medications, monitoring with a peak flow meter);
 - Ensure that students with asthma have convenient access to their medications;
 - Modify physical activities to match current asthma symptoms.

Self-Management of Asthma in Schools

To ensure the best possible health of asthmatics and their full participation in school, the American School Health Association has recommended that all school boards adopt asthma management policies centered on student self-management of asthma.¹⁵ A supportive school environment is necessary for successful self-management of asthma. Self-management of asthma includes knowing when to use medication, properly using medication, assessing lung function with peak flow readings, controlling exposure to known asthma attack triggers as best as possible, and having a good relationship with a health care provider.

Students need to begin taking an active role in the management of their asthma as early as possible. Since asthma is a chronic condition, the sooner one learns to self-manage it, the better. According to a survey by Slack et al., while students (specifically those aged 13-17) desire complete control of their asthma, they struggle through conflicts with authority figures who wish to control their ability to take medication when necessary.¹⁶ In the study, they indicated fear of having an asthma attack without immediate access to rescue medication. The teenagers studied indicated that they were unlikely to overuse their medication because of knowledge and concern about adverse effects.

The overriding benefit of asthma education and student self-management of asthma is a reduction in asthma morbidity and mortality. Self-management also increases independence, feeling of control over asthma, and healthy social and emotional development.¹⁷ Full self-management should allow and encourage capable students of administering their own inhaled medications. Authority figures, such as parents and teachers, can sometimes place barriers to effective self-management of asthma. Although parents often recognize that their children are capable of self-medicating appropriately and when necessary, they are reluctant to relinquish control.¹⁸ Authority figures must respect a student's report of his current asthma condition. Having medication stored in the school office or health office is also a barrier to effective self-management of asthma.

Students' Perceptions of Asthma Severity

A student's ability to perceive the severity of an asthma attack from symptoms and to have the motivation to carry out a plan based on the perception of an asthmatic state is essential to successful self-management of asthma.¹⁹ Accurate symptom perception leads to less morbidity from asthma by allowing children to appropriately change activity level, alter the surrounding environment, or initiate bronchodilator treatment promptly and early in the attack. Children's perceptual accuracy can be influenced by physiological, psychological, cognitive, and parental factors.

A wide range of perceptual ability of asthma attack severity has been found among children when actual peak expiratory flow values were compared with their best guesses based on how they felt.²⁰ Inaccurate perceptions of asthma activity occur in two directions: blunted perception or overperception.¹¹ Students with blunted perception consider themselves symptom-free in the midst of an asthma attack and are less motivated to take rescue medication; therefore they need education on using peak flow readings more frequently to gauge asthma status. Those with overperception have a high degree of breathlessness associated with asthma attacks and are more likely to overuse rescue medication, so education is best focused on selective perception. Those with accurate perception of asthma activity are less likely to take medication when they are feeling fine; consequently they need education about the reasons for prophylactic medication.

A study by Rietveld et al. found perception of compromised airways to be no better in asthmatics than children without asthma.²¹ Although counterintuitive, it is possible that in a disease like asthma with sometimes non-specific symptoms (e.g., cough), people may become less perceptive of symptoms over time.¹¹ Despite literature on children's varied perceptual abilities, practitioners who specialize in asthma have found with clinical experience that most children do have adequate perception of asthma activity to know when they need to use their rescue medication. According nurse practitioner Karen Allaire, a pediatric asthma specialist from the UW Health system, it is important to consider the developmental age of a child, and not simply their age, when determining whether he is ready and able to self-medicate. Children as young as 5 years have demonstrated the ability to properly self-medicate, while sometimes middle school students are not competent enough to self-medicate.¹⁸ It is more difficult for children with mild asthma compared to moderate-severe asthma to gauge the activity of the disease and manage it by themselves.

Asthma Self-Management Legislation

During the 1997-98 legislative session Act 77 was passed by the Wisconsin legislature and signed into law by Governor Tommy Thompson.²² Act 77 relates to the possession and use of inhalers by asthmatic students and goes into effect September 1, 1999. Specifically, the law states that asthmatic students "may possess and use a metered dose inhaler or dry powder inhaler while in school, at a school-sponsored activity or under the supervision of a school authority" if specific conditions have been met:

- 1) To use the inhaler to prevent onset of or to alleviate asthmatic symptoms.
- 2) To have written approval of his/her physician, and if a minor, written approval from his/her parent or guardian.
- 3) To provide the school principal with a copy of the physician and parent or guardian approvals.

Provisions of Act 77 offer protection for school districts, school boards, and school employees against civil liability in the event the application of this act results in a negative outcome for a particular student, provided good faith efforts are made to ensure that the conditions are met. As long as the requirements of the law are fulfilled, as of September 1, 1999, no school district in Wisconsin can require students to leave their inhalers in an administrative office, health room, or with an adult supervisor.

Although the law applies to Wisconsin school children of all ages, it is probable that for some of the youngest students, either the health care provider or parent will prefer that the student not carry an inhaler. While the act does not specifically exclude inhaled steroids, most steroid inhalers can be scheduled for administration outside of school hours. The goal of the act is to extend the rights of students to carry rescue bronchodilators such as albuterol.

Concerns Regarding Act 77

Concerns regarding Act 77 include overuse or inappropriate use of inhalers leading to manipulation out of physical activity (e.g., gym class) or toxicity from the drug. Toxicity from bronchodilators such as albuterol includes nervousness, insomnia, jitteriness, nausea, or tachycardia. Schools already allowing self-management of asthma with inhalers indicate these concerns have not been a problem. Nurse Ellen Simandl, president of the Wisconsin Association of School Nurses, emphasized that students should be reminded that carrying an inhaler requires responsible behavior. Although most health care providers believe that students will be responsible about carrying and using inhalers, privileges for carrying and using inhalers of students demonstrating irresponsible behavior should be amended. Another area of concern is sharing inhalers with other students; however, this has not become an issue in schools already allowing inhalers to be carried by students. In addition, there is no indication that the inhalers have an abuse potential by students without asthma.²³

Current Status of Asthma Self-Management in Schools

Some school districts in Wisconsin already allow children to carry and use inhalers, although this has not always been well publicized within those school districts. According to Madison Public School System nurse practitioner Freddie Adelson, students of all ages (although most often middle and high school students) in Madison have been allowed to carry inhalers for the past several years. The Milwaukee public school system has a well defined asthma management policy that involves both teachers and students, and is founded in the recognition of the importance of students being allowed to carry an asthma inhaler.²⁴ In Milwaukee, schools allow all

students to carry an inhaler; however those in grades K-5 may self-administer inhalers only under the supervision of school staff. Students who carry and self-administer inhalers need to complete a "Medical Release Form for Inhaler Use" which includes health care provider and parent signatures of approval, as required by Act 77 (see reference 25 for web site to access the Milwaukee form).

Support for Act 77

Prompt awareness of asthma symptoms and appropriate use of medication can be decisive in gaining control of an asthma attack and preventing extreme morbidity or mortality. This paper serves not only to support asthmatic and EIA students' carrying inhalers in schools, but also to encourage their appropriate use. The following guidelines should be followed for both on- and off-campus school sponsored activities. The approval of a student to carry and use an inhaler should be made on a case-by-case basis, meaning that the health care provider, and parent/guardian if the child is a minor, agree that the student is capable of, and motivated to self-manage his asthma or EIA. The use of inhalers at school is supported for scheduled preventive treatments, treatment of an asthma attack, or pre-medication before known triggers such as exercise. All asthmatics, including students in grades K-12, should carry their own rescue inhaler in case of an unexpected exposure to triggers or to relieve an exacerbation because rescue inhalers are most beneficial if they are immediately accessible.¹ Whether all students should be allowed to self-medicate depends on their maturity, knowledge of when to use the inhaler, and skill in using the inhaler. According to pharmacist Val Schend, an asthma specialist of the UW Health System, many children in grades K-5 know when they need to use a rescue inhaler; however, some do not have the fine motor skills to correctly use an inhaler all of the time. These students are best off with supervised administration of the inhaler by a school nurse or teacher. A child's ability to properly use an inhaler may change with the type of inhaler used. If it is determined that a student should not carry his own inhaler, the inhaler still needs to be kept accessible, not locked away.

Several associations and organizations have shown support for student self-management of asthma in schools. The Wisconsin chapter of the American Lung Association was supportive of the passage of Act 77.²⁶ The Allergy and Asthma Network Mothers of Asthmatics has created a bill of rights for children with asthma, which includes support for learning self-management skills and having full access to medications.²⁷ The American Academy of Pediatrics supports students' increasing responsibility for their own health care, including self-medication when both the health care provider and parent or guardian agree that the student is competent to self-medicate.²⁸ The American Academy of Pediatrics also advocates allowing

students with EIA to use their prescribed beta₂-agonist inhalers "before school-sponsored sports activities, including practices and competition, and physical education classes."⁷ The American Academy of Allergy, Asthma, and Immunology promotes using the insight of health care providers and parents to judge if a student is able to properly and responsibly self-manage his asthma.²⁵

Successful Implementation of Act 77

Requests from parents and students to carry and self-administer inhalers will likely increase this fall as more people become aware of Wisconsin Act 77, especially in school districts where students formerly did not have such privileges. School districts are encouraged to send district-wide mailings informing all parents and students of the new law and describing actions needed to allow a student to carry and use an inhaler in school. Successful implementation of Wisconsin Act 77 will be centered on a school district's ability to create a comprehensive, district-wide asthma management program. Since a policy regarding students' carrying and use of inhalers needs to be implemented in September, it is an ideal time to add or update policies regarding environmental control, asthma monitoring, emergency care, attendance, and physical and health education of asthma into a comprehensive program. Despite Act 77, some school districts may feel it is unnecessary to create a comprehensive asthma management program; however, asthma students who require assistance or modifications in school are assured such help per Section 504 of the Rehabilitation Act of 1973.¹³ A helpful resource for schools to refer to when creating a comprehensive asthma management program is the NIH

Table 3: Components of an Asthma Management Program for Consideration

1. Determine what resources are currently available in the school
2. Assess what resources will be needed during school hours
3. Address access to health services in the school
4. Identify policy or resource barriers to a healthy environment (minimal asthma triggers), monitoring peak flow, administering medications, participating in physical education, recess, or sports
5. Identifying who will be responsible for eliminating identified allergens and irritants, monitoring peak flow, administering or supervising medications, providing emergency care
6. Student asthma education and school staff development on asthma

Adapted from: Majer LS. Managing patients who have asthma: the pediatrician and the school. *Pediatr Rev* 1993;14:391-4.; American School Health Association Resolutions

Table 4: Essential Components of an Asthma Management Plan

1. Brief history of the student's asthma
2. Asthma symptoms
3. Information on how to contact the student's health care provider and parent/guardian
4. Health care provider and parent/guardian signature
5. List of triggers that make the student's asthma worse
6. The student's personal best peak flow reading
7. List of the student's asthma medications and which ones will be carried/used in school
8. Description of the student's treatment plan, based on symptoms or peak flow readings, including recommended actions for school personnel to help handle asthma episodes

Adapted from: NHLBI. Asthma & physical activity in the school: making a difference. September 1995. U.S. Department of Health and Human Services, NIH Pub. No. 95-3651.

publication *Managing Asthma: A Guide for Schools*.²⁹ In addition, table 3 highlights some issues to consider addressing in an asthma management program. The remainder of this paper will address selected issues.

Release Forms and Asthma Management Plans

School districts should create a release form for inhaler use and a general asthma management plan information form. This set of documents needs to be completed and put on file at the school for each asthmatic student desiring to carry and use inhalers at school. The release form should clearly indicate that the student has been judged competent in self-management of his asthma with an inhaler. For clarity, the form should make distinctions as to whether the student has both the knowledge and skills to carry and self-administer inhalers or whether he only has satisfactory knowledge of when to use an inhaler, therefore needing adult supervision during its use for skill reinforcement. An asthma management plan is a collaborative effort of the student, parent/guardian, school staff and health care provider.¹⁴ Depending on a student's needs, the plan may be a brief information card or an extensive individualized health plan. Table 4 lists the essential components of an asthma management plan (see reference 30 for the NIH example of an asthma management plan). The asthma management plan should be distributed to the teachers and coaches that the student has the most regular contact with.

School Nurse Involvement

Linda Olson, Wisconsin's Department of Public Instruction School Nurse Consultant, would like to see school nurses conduct their own assessment of an asthmatic student once the asthma management plan has been brought to the school. This additional assessment of competency would serve to ensure

that the student not only has proper self-administration skills, but also displays responsible inhaler use behavior in school. Another ideal role for the school nurse is to implement a system to monitor students' use of their inhalers.

Peak Flow Meters

Assessment by the school nurse would provide an ideal opportunity to take a baseline peak flow reading for the student's asthma management plan. Peak flow readings can help students gauge the severity of an asthma attack if they occasionally have difficulty perceiving asthma attack severity. Students should be encouraged to carry their own peak flow meters. If not, schools should have peak flow meters available for students or nurses to use to monitor airway status.

Medication Passes

Schools may consider developing a "medication pass."^{13,28} This is a pass that students could show any inquiring school employee to verify that he has permission on record with the school to be carrying and self-administering medication. These "medication passes" may especially be a good idea in schools with very strict "drug-free" policies to strengthen the delineation of a students' appropriateness in carrying an inhaler.

Spare Inhalers in School

In a school district's asthma management program, policies addressing the storage of spare inhalers in school should be addressed. Some parents may be concerned about their child misplacing his inhaler and therefore prefer to have a spare inhaler in a secure place in the school. The school should have pre-determined secure places such as the health office, keeping in mind the need for access in case of an emergent asthma attack.

Teacher Education on Asthma

Because asthma severity varies among students and with the season of the year, it is important for teachers to understand what asthma is and what the needs of an asthmatic are.¹⁴ Sessions on asthma during inservices can help teachers learn the warning signs of an asthma attack, be comfortable assisting a student having a asthma attack, learn how to use common types of inhalers and spacers properly, and understand the feelings that a child may experience after having an asthma attack. Teachers are also in the unique situation to notice signs of a child struggling with physical activity and suggest being evaluated for asthma or the need to make changes to medication regimens.²⁹

Student Education on Asthma

Often children with asthma desire to hide their need for medication.³¹ Accessing medications must be easy, convenient, and not embarrassing to students or they may not use the needed medication, causing unnecessary worsening of asthma. To curb the feeling of isolation from being sick, teachers should allow children to take inhaled medication without creating a scene. Teaching about asthma to all children can

help decrease asthmatics' feelings of anxiety and being different along with promoting acceptance by peers. Asthma awareness programs could be considered as part of a health education curriculum. In addition, asthma education could be incorporated into the traditional school curriculum, e.g., math class and peak flow meters.³² For asthmatics ages 8-11, management programs such as the American Lung Association's "Open Airways for School" program can help promote healthy self-management of asthma.³³

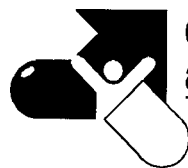
Conclusion

By carefully drafting an asthma management program, a school district can have a smooth transition to allowing students to carry and self-administer inhalers. A school district's asthma management program and each student's asthma management plan should be individually reviewed annually. By cooperative collaboration of students, parents or guardians, school staff, and health care providers, asthma can be controlled in a school environment. Nothing less should be expected. ■

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Center for Drug Policy and Clinical Economics

Position Statement

June 10, 1999

Asthma Self-Management in Wisconsin Schools

Asthma is a leading chronic illness among children, and is a leading cause of school absenteeism. In the United States nearly 5 million children (5 to 7% of the school-age population ages 5 to 18), have asthma. In Wisconsin, it has been estimated that approximately 9% of school-age children have asthma. The primary type of medications used to manage asthma are bronchodilators administered by inhaler. Approximately 5 to 7% of school-age children require these medications to manage their disease.

During the 1997-98 legislative session in Wisconsin, Act 77 was passed, allowing asthmatic students to "possess and use a metered dose inhaler or dry powder inhaler while in school, at a school-sponsored activity or under the supervision of a school authority," provided specific conditions have been met (the inhaler is only to be used to prevent onset of or to alleviate asthmatic symptoms, and written approval of the students physician, and parent or guardian must be provided to the school principal). Act 77 goes into effect on September 1, 1999.

Effective asthma management at school has many benefits:

- Promotes a supportive learning environment for students with asthma;
- Promotes optimal school performance by controlling symptoms, thereby reducing absences;
- Reduces disruption in the classroom;
- Provides the necessary support in the event of an emergency;
- Permits students to achieve full participation in physical activities.

The UWHC Center for Drug Policy and Clinical Economics **supports** the full implementation of Wisconsin Act 77 in schools throughout the State. Since the use of medications by children is inherently risky and requires particular attention to avoid medication misuse, the Center further encourages Wisconsin pharmacists to take an active role in the successful development of policies and procedures with individual Boards of Education in their communities as Act 77 is implemented.

This position statement was developed by the University of Wisconsin Hospitals and Clinics, Center for Drug Policy and Clinical Economics. For information regarding the Center or the position, please contact Lee Vermeulen, MS, Director, Center for Drug Policy and Clinical Economics, Department of Pharmacy, 600 Highland Avenue, Room F6/133, Madison, Wisconsin 53792, telephone 608/262-7537, telefax 608/263-9424, e-mail lc.vermeulen@hosp.wisc.edu.