Synopsis of the Patient Safety Work Group

RECOMMENDATIONS TO THE PATIENT SAFETY FORUM

November 16, 2000

EXECUTIVE SUMMARY

Representatives from a number of diverse organizations and health care professionals have been meeting since May 2000 to consider methods to improve patient safety and reduce medical errors in Wisconsin. Our initial discussions focused on patient safety initiatives in hospitals, extended care facilities, nursing homes and other health care facilities. However, it is the belief of the group that patient safety must be embraced in all settings and as a part of the "culture" of health care in Wisconsin.

As an outgrowth of a patient safety meeting on May 24, 2000, attended by more than 50 people (list attached), a smaller work group was established and has been meeting on a monthly basis to investigate, discuss and come to consensus on recommendations to improve patient safety. Representatives from the following organizations contributed to the final recommendations:

AARP
Dean Health Systems
Employer Health Care Alliance Cooperative
Marshfield Clinic
Medical College of Wisconsin
MetaStar
National Patient Safety Foundation
Pharmacy Society of Wisconsin
Rural Wisconsin Health Cooperative
State Medical Society of Wisconsin
WEA Trust
Wisconsin Association of Health Plans
Wisconsin Health & Hospital Association
Wisconsin Manufacturers & Commerce
Wisconsin Nurses Association

The work of this ad hoc group was prompted by a desire to proactively address the serious issue of patient safety and medical errors. A report recently released by the Institute of Medicine titled, "To Err is Human: Building a Safer Heath System," estimated that medication errors could be within the top 10 causes of death in the United States.

The group has spent the majority of its time evaluating medication errors as one type of medical error. Medication errors occur largely as a process function and can be categorized into the following process components: prescribing errors, dispensing errors, administration errors, and errors in consumer use. Steps are needed to reduce medication errors in both inpatient institutions, like hospitals and nursing homes, and outpatient environments, including physician practices and community pharmacies. Maintaining the status quo has been recognized as inadequate. Purchasers of health care must also work to create payment systems that reward quality and high levels of service.

Given the tight timetable the group imposed on itself in order to bring recommendations to the November 16th Patient Safety Forum, the group focused its discussion mostly on inpatient care at hospitals and other appropriate health care facilities. The following list is not to be considered an exhaustive one. In fact, there may be other means of achieving the same results. These recommendations are offered as areas warranting immediate attention by providers, purchasers and consumers of health care in Wisconsin.

In the months ahead, many groups will be bringing these recommendations to their respective governing bodies for review and endorsement.

1. Hospitals, extended care facilities, nursing homes and other health care facilities need to provide 24-hour pharmacy coverage either on-site or on-call (by telephone access to a staff pharmacist or contracted through a community pharmacist).

2. Hospitals, community pharmacies, ambulatory clinics, and any other health care facilities that dispense medication should utilize available computer software to provide clinical screening to maximize patient safety in the dispensing of all prescription medications.

3. Hospitals and other appropriate health care facilities should conduct an evaluation of an integrated computerized prescriber order entry (CPOE) system with clinical decision support for medications and other ordered services by January 1, 2002 with implementation by January 1, 2004.

4. Hospitals, extended care facilities, nursing homes and other appropriate health care facilities responsible for the administration of medications to patients should implement an oral and inhalant unit dose distribution system for all non-emergency medications administered within the facility by January 1, 2002.

5. Hospitals and ambulatory health care centers should utilize a pharmacy based and pharmacist managed process for the preparation of intravenous admixture solutions.

6. Pharmacies and physicians should include the generic name on the label of prescription medications dispensed to patients.

7. Hospitals and other appropriate health care facilities should investigate and evaluate the use of bar-coding systems for the packaging and administration of medications by January 1, 2002.

8. Hospitals and other appropriate health care facilities should prepare and maintain written policies and procedures for the use of select high-risk medications within the facility.

9. Prescribers should institute actions to eliminate the use of symbols and phrases that are commonly misinterpreted by pharmacists and other health care providers.

10. Prescribers and pharmacists should include the intended use on all prescription orders and prescription drug labels and packages for consumers.

MEDICATION SAFETY RECOMMENDATIONS FOR WISCONSIN HEALTH CARE PROVIDERS

1. **Hospitals, extended care facilities, nursing homes and other health care facilities need to provide 24-hour pharmacy coverage either on-site or on-call (by telephone access to a staff pharmacist or contracted through a community pharmacist).**

   Access to the clinical skill and knowledge of pharmacists is essential today given the complexity of therapies provided to hospitalized patients. Most of the larger and busier hospitals employ pharmacists on a 24-hour, 7-day per week basis. However, some hospitals and other health care facilities do not have the patient demand for full-time pharmacist services on a 24-hour basis. In those cases where a pharmacist is not physically present within the hospital and medication services are called for, it is recommended that the hospital staff follow written procedures to contact a pharmacist on-call for either a verbal consultation or to attend to the situation directly.

   Pharmacist review of prescription orders and the provision of information by pharmacists to prescribers have clearly resulted in a decrease in adverse drug events and medication errors. Literature consistently demonstrates patient safety and financial benefits when pharmacists work "decentrally" on patient care units with doctors and nurses to monitor patient drug therapy and provide drug information services. A 1999 JAMA article published by Leape, et al. showed a 66% decline in adverse drug events for patients in an intensive care unit when clinical pharmacist services were provided. Pharmacist services are also important in the preparation of intravenous and other injectable solutions commonly provided in a hospital.

2. **Hospitals, community pharmacies, ambulatory clinics, and any other health care facilities that dispense medication should utilize available computer software to provide clinical screening to maximize patient safety in the dispensing of all prescription medications.**

   The growing complexity of drug regimens coupled with the rapid influx of newly approved medications makes automated computerized screening imperative. The literature is replete with examples of adverse drug events that could have been prevented if appropriate computerized clinical screening was in place. By January 1, 2002, hospitals, community pharmacies, ambulatory clinics, and other health care facilities that dispense medication should have an implementation plan for such a system. The system itself should be in place by January 1, 2003. Drug allergy, drug-drug interaction, maximum dose alerts for high-risk drugs and therapeutic duplication alerts should be minimum requirements.

   Computerized prescriber order entry systems may include this type of computerized clinical support service. However, many pharmacy based software systems also are readily available and used to provide this function. Because the experience in the use of pharmacy-based systems is considerably greater than the prescriber order entry systems, implementation of a dispensing based software system is both less expensive and easier to accomplish from a systems standpoint. The use of such software, however, should not supplant the evaluation of a prescription/medication order by the responsible physician or pharmacist prior to the dispensing of the medication.

3. **Hospitals and other appropriate health care facilities should conduct an evaluation of an integrated computerized prescriber order entry (CPOE) system with clinical decision support for medications and other ordered services by January 1, 2002 with implementation by January 1, 2004.**

   Systematic approaches toward improving provider entry of prescription orders formally into the health care system are needed to reduce the prevalence of medication errors. Computer systems and approaches which may involve services through the Internet can enable prescribers to enter orders electronically, thereby, eliminating errors associated with transcription or miscommunication with other health care professionals and improving system response time. These systems also provide the ability to incorporate relevant information for the prescriber as an aid in his/her decision making process. Practical information regarding drug formularies, standard doses and dosing intervals, instructions for use of high-risk drugs, laboratory parameters, etc. can also be provided through sophisticated prescriber order entry systems.

   Prescription order legibility is a common and well-known problem within the traditional delivery system. Although systems are available to enable the entry of orders electronically which dramatically reduces the prevalence of error in the order process, it is estimated that less than 5% of hospitals and clinics have incorporated the use of such technology.

   One reason for the slow adoption of such technology is that it is extremely expensive and complex. Most hospital systems currently cost in excess of one million dollars. In addition, significant administrative, interfacing and training issues also must be addressed with the consideration and implementation of any prescriber order entry system.

   Although significant organizational issues must be addressed by Wisconsin's hospitals, prescribers and other health care providers, the elimination of handwritten prescriptions in both inpatient and ambulatory settings by January 1, 2004* is recommended as a universal goal. By January 1, 2002, hospitals, clinics and other appropriate health care facilities must evaluate the feasibility of adopting and implementing a CPOE system. This evaluation must address human resource, financial and technological needs as well as cultural and geographic issues specific to the individual facility.

   *Please note that it is explicitly recognized that the design and evaluation of these systems has focused on large hospitals and the appropriate adaptations for rural providers by the manufacturers and Internet providers may or may not be available in time to meet the January 2004 goal.

4. **Hospitals, extended care facilities, nursing homes and other appropriate health care facilities responsible for the administration of medications to patients should implement an oral and inhalant unit dose distribution system for all non-emergency medications administered within the facility by January 1, 2002.**

   The use of unit dose medication packaging and distribution systems has proven to reduce the incidence of medication errors in the administration process within health care facilities. The special packaging and labeling of medications individually assures that each dose is administered or accounted for. Unit dose systems have been successfully used in most Wisconsin hospitals since the 1970's. However, many hospitals do not regularly use unit dose containers for some liquid and injectable medications which creates a greater potential for error in the administration of the medication. For example, a common practice in some hospitals is to keep a bulk vial of an injectable drug in the hospital floor stock and then withdraw the necessary amount of medication into a syringe at the patient's bedside immediately prior to administration. This practice creates a greater potential for inaccuracy than a system that provides pre-drawn syringes. Comprehensive unit dose packaging should be provided in all Wisconsin facilities.

5. **Hospitals and ambulatory health care centers should utilize a pharmacy based and pharmacist managed process for the preparation of intravenous admixture solutions.**

All sterile medications should be prepared and labeled in a suitable sterile environment by appropriately trained personnel. Quality assurance procedures for the preparation of sterile products must exist. Pharmacists must be responsible for the correct preparation of sterile products in all practice settings. The increased rate of development of new drugs, and look-alike/sound-alike drug names has resulted in a dramatically increased rate of medication errors and adverse drug events if such products are prepared in the absence of a pharmacist. Patient morbidity and mortality have resulted from incorrectly prepared or contaminated sterile products. Recent ISMP publications and lay press articles (e.g. 9/00 Chicago Tribune nursing series) provide many specific examples in which sentinel events have occurred when nurses mistake one sterile product for another, as well as examples of patient infections resulting from poor aseptic technique. A comprehensive rule was recently passed by the Wisconsin Pharmacy Examining Board to assure safe and appropriate sterile product preparation in all Wisconsin pharmacies. This standard should be followed in all practice settings and by all health professionals involved in the preparation of sterile products.

Patient morbidity and mortality have resulted from incorrectly prepared or contaminated sterile products. By eliminating the need for nursing personnel and others to calculate, manipulate and mix intravenous medications, errors and adverse events can be reduced. Except in emergency situations, pharmacies should be responsible for the accurate preparation of sterile products and should follow standards established to ensure that products prepared are of the highest quality. In addition, written guidelines and standard concentrations should be used by the pharmacy to reduce adverse events associated with certain high-risk medication infusions such as heparin, insulin, concentrated electrolytes, opiate narcotics, and chemotherapy.

6. **Pharmacies and physicians should include the generic name on the label of prescription medications dispensed to patients.**

Countless examples of look-alike/sound-alike brand name products exist (e.g., Celebrex, Celexa, Cerebyx). Additionally, many generic drugs are multi-sourced which may result in patient confusion and therapeutic duplication if generic names are not used on prescription labels (e.g., generic drugs are often interchanged within pharmacies due to contracting and product availability reasons). Competing generic drugs may appear physically different yet be absolutely equivalent. The use of generic names should provide patients with information to avoid unintentional duplication, which may otherwise occur. Brand names may be recommended on a label, in addition to the generic name, if the brand name product is dispensed.

7. **Hospitals and other appropriate health care facilities should investigate and evaluate the use of bar-coding systems for the packaging and administration of medications by January 1, 2002.**

Multiple studies within the medical literature consistently demonstrate that more than 30% of medication errors and adverse drug events occur at the administration stage of the medication use process. Systems exist that utilize bar code technology to assure accurate medication selection and dispensation by the pharmacist. Other systems exist that utilize handheld personal digital assistants, barcode technology, and wireless communications to assure the safe administration of medications to patients by nurses and other health care professionals at the patient's bedside. These systems can drastically improve the accuracy of medication administration as well as automate the documentation process. Unfortunately, although many such systems are marketed, very few of these systems have been effectively implemented in hospitals to date.

8. Hospitals and other appropriate health care facilities should prepare and maintain written policies and procedures for the use of select high-risk medications within the facility.

The most serious and sometimes lethal medication errors have been attributed to medications in concentrated form or with narrow therapeutic indices. Health care facilities can minimize errors and adverse events with the implementation of written guidelines, checklists, dose limits, preprinted order forms and elimination of certain high-risk floor stock medications.

Select medications, as well as the route of administration, are frequently implicated in medication misadventures. Insulin, heparin, thrombolytics, potassium chloride, hypertonic saline, dextrose 50% solution, epidurals, opioids administered through patient controlled analgesia (PCA), and chemotherapeutic agents are some of the medications that are implicated in medication errors and/or adverse drug events. These medications can be problematic for a variety of reasons including: look-alike/sound-alike potential; narrow therapeutic index; side effect profile; confusing or multiple dosing regimens; and/or complex administration requirements. Policies and procedures can be drafted and implemented that minimize the potential for errors with these agents. Written policies for hospitals and other appropriate health care facilities should include special protocols for high-risk medications and should specify educational programs for training personnel. For instance, removing concentrated potassium chloride and hypertonic saline from patient care units prevents the inadvertent and unintended administration of these agents. Requiring double checks on pump programming for epidurals and PCAs as well as double checks for all chemotherapy administration can also minimize the likelihood of error.

9. Prescribers should institute actions to eliminate the use of symbols and phrases that are commonly misinterpreted by pharmacists and other health care providers.

Symbols and abbreviations are frequently used to save time and effort when writing prescriptions and documenting in patient charts. (See attachment A) However, some symbols and abbreviations have the potential for misinterpretation or confusion. Examples of especially problematic abbreviations include: U for units and μg for micrograms. When U is handwritten, it can often look like a zero. There are numerous case reports where the root cause of sentinel events related to insulin has been the interpretation of a U as a zero. Using the abbreviation μg instead of mcg has also been the source of errors because the symbol μ, when handwritten can look like a zero. The use of trailing zeros (e.g., 2.0 vs. 2) is another dangerous order writing practice. The decimal point is sometimes not seen when orders are handwritten using trailing zeros. Misinterpretation of such an order could lead to a 10-fold dosing error. To minimize the potential for error and to maximize patient safety, prescribers need to avoid select abbreviations and phrases.

10. Prescribers and pharmacists should include the intended use on all prescription orders and prescription drug labels and packages for consumers.

Incorporation of the indication for use of a medication on prescription orders has been demonstrated as an inexpensive and efficient method to enable enhanced patient education regarding their therapy and minimize errors associated with either misinterpreted prescription orders by pharmacists or sub-optimal ordering by a prescriber. The absence of indications on prescription orders and drug labels can be a barrier to providing appropriate and safe medication therapy. A large number of medications currently available are used for a variety of disease states. In many cases, a single agent can have many different indications. A patient's confidence can be severely undermined if they are educated that their medication is for one problem when the physician intended for the medication to be used for something completely different. For instance, a pharmacist counseling a patient on propranolol could easily assume that it is being used to treat hypertension when it was really intended to be used for migraine headache prophylaxis. Obviously, this could lead to significant confusion for the patient.

Including the indication on prescriptions can also assist the pharmacist in screening the medication order for proper dose, duration, and appropriateness. Having the indication on prescription orders minimizes the risk of confusion due to look-alike medications as well as the risk of misinterpretation due to poorly handwritten orders. Knowledge of the intended use may also enable pharmacists to intervene when multiple prescribers unknowingly order duplicative therapy for the same patient.

ITEMS FOR FUTURE DISCUSSION

The External Work Group's initial efforts were first directed at updating ourselves about the significant patient safety activities at the national level and identifying the applicable Wisconsin "best practice improvements" involving medication errors. The group only briefly considered the topic of regulatory reform. At this point in time, the work group felt regulatory initiatives would be premature. This did not, however, exclude possible regulatory initiatives in the future.

It is clear that the analysis of patient safety is a complex and evolving area, and that there is still a divergence of opinion at both the state and national level about what sort of regulation enhances or harms the efforts to achieve improved patient safety. The work group also believes it is crucial that state efforts complement, not conflict, with concurrent national efforts.

The External Work Group plans to continue meeting to address other methods and opportunities to improve patient safety. No specific meeting dates have been identified at this time. There is recognition that a budget may need to be pulled together to coordinate these meetings and subsequent follow-up activities. The work group is also aware other groups who wish to be more involved. Below is a partial list for future discussion (not listed in any order of importance).

1. Expand the scope of discussion from hospital and other appropriate health care facilities to include ambulatory care facilities.

2. Evaluate and recommend practices, which would assist health insurance purchasers and consumers to become actively involved in patient safety. Many reports mention the need for greater consumer involvement in this issue, but few make concrete recommendations about how best to involve consumers.

3. Evaluate steps needed to make prescription usage safer for patients at home.

4. Assess the need for educational programs for consumers related to their health care and assess whom best to plan and provide that education. Work with other groups to support an educational initiative.

5. Standardization of drug labeling and packaging.

6. Assess information about IV pump technology and improvement efforts related to safeguards and training of personnel allowing the group to make further recommendations that promote patient safety.

7. Other patient safety concerns for possible review are fall prevention, wrong site surgery and transfusion procedure error reduction.

ATTACHMENT A

Commonly Misinterpreted Abbreviations

Abbreviation	***Intended meaning***	***Common Error***
U	Units	Mistaken as zero or a four resulting in overdose. Also mistaken for “cc” (cubic centimeters) when poorly written.
µg	Micrograms	Mistaken for "mg" (milligrams) resulting in a ten-fold overdose
*Q.D.	Latin abbreviation for every Day	The period after the "Q" has sometimes been mistaken for an " I, " and the drug has been given "QID" (four times daily) rather than daily.
*Q.O.D.	Latin abbreviation for every other day	Misinterpreted as "QD" (daily) or "QID" (four times daily). If the "O" is poorly written, it looks like a period or "I." SC or SQ
Subcutaneous		Mistaken as "SL" (sublingual) when poorly written.
TIW	Three times a week	Misinterpreted as "three times a day" or "twice a week”
D/C	Discharge; also discontinue. Patient's medications have been prematurely discontinued when D/C, (intended to mean "discharge")	Misinterpreted as "discontinue," because it was followed by a list of drugs.
HS	Half strength	Misinterpreted as the Latin abbreviation "HS" (hour of sleep).
Trailing Zero	_____.0	Missing decimal point
cc	Cubic centimeters	Mistaken as “U”(units when poorly written.
AU, AS, AD	Latin abbreviation for both ears; left ear; right ear	Misinterpreted as the Latin abbreviation "OU" (both eyes); "OS" (left eye); "OD" (right eye)

*High Percentage of Errors