Parenteral to Oral Switch for Gatifloxacin (Tequin®) and Other Fluoroquinolines:

Several studies have shown equivalent therapeutic efficacy and outcomes when intravenous antibiotics are switched to an equipotent equivalent oral dosage form. In addition, these studies also demonstrated significant cost savings. Practice Guidelines for treating community-acquired pneumonia published by the Infectious Diseases Society of America promotes changing from IV to oral therapy and sites economic, health care, and social benefits. A number of antibiotics, including the fluoroquinolones, metronidazole (Flagyl®), fluconazole (Diflucan®) and azithromycin (Zithromax®) achieve similar serum drug levels when administered orally or intravenously. For these reasons and with the success of the IV to oral switch of famotidine (Pepcid®) and pantoprazole (Protonix®), the P&T Committee has approved guidelines for a pharmacist-implemented IV to oral gatifloxacin (and all other fluoroquinolones) conversion. All pediatric, ICU and neutropenic patients are excluded from this protocol. Pharmacists will ensure adult patients have a functioning GI tract, a resolution of abnormal vital signs, and a decreasing WBC before the conversion occurs. Physicians will know a conversion occurred by the presence of a signed protocol order form in the medical record. This program will begin in January.

Formulary Additions:

Two newer drugs used to treat attention deficit hyperactive disorder have been added to the Formulary. Extended-release methylphenidate (Concerta®) can be initiated with 18mg daily in the morning. The other drug is an extended-release combination of amphetamine and dextroamphetamine (Adderall XR®) which may be initiated with 5mg daily.

Topical lidocaine 4% cream (LMX4®, Elamax®) was approved onto the Formulary and will replace lidocaine/prilocaine cream (Emla®). An autosubstitution was also approved by the P&T Committee which will allow pharmacists to switch to the Elamax® product whenever the Emla® is ordered.

Drug Shortages and Re-supply:

- Methylprednisolone injection (SoludMedrol®) continues to be in short supply until the middle of 2004. Parenteral dexamethasone and hydrocortisone are possible alternatives, as well as oral methylprednisolone.

- A shortage of cartridges used in the preparation of hydromorphone (Dilaudid®) and fentanyl for PCA pumps has been resolved. Both of these products may now be ordered for patient therapy.

- Availability of parenteral erythromycin has improved and is available for prescribing.

- The manufacturer of injectable betamethasone suspension has restricted distribution of this drug to hospitals with neonatal intensive care units. Based on the current supply and history of utilization, it was decided to make this drug available once again, but restricted to antepartum administration.
Reminder: Include Dictation Numbers When Writing Orders:

Dictation numbers are more easily read, help identify prescribers and assist in quickly resolving questions about written orders.

**Adverse Drug Events Hotline – 655-6805**
Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)
Pneumococcal Immunizations – Compliance with Joint Commission Standard:
On January 5th, the piloting of a new form for the screening and administration of the pneumococcal immunization began on 2700, 3700, and 4500. This form was developed in order to increase our compliance to a JCAHO Practice Standard. Prior to this our compliance was 1% in screening and administration of the vaccine. Our goal is to be 90% compliant within 6 months of the kick off date. The form is multidisciplinary for all adult patients; with the nurse completing the screening portion, the physician completing the order section, and the nurse finalizing the administration section if the vaccine is ordered.

Entacapone (Comtan®) Added to the Formulary:
The Pharmacy and Therapeutics Committee has added entacapone to the Formulary. Entacapone is indicated as an adjunct to levodopa/carbidopa to treat patients with idiopathic parkinsonism who experience signs and symptoms of end-of-dose “wearing-off”. Entacapone has no antiparkinson effect of its own.

Autosubstitutions Approved by P&T:
- Hydrochlorothiazide doses greater than 25mg (including combination products such as Maxzide-50) will be converted to 25mg hydrochlorothiazide. The reason for this autosubstitution is the lack of documented benefit with daily hydrochlorothiazide doses greater than 25 mg and the potential for more side effects.
- Mesna injectable solution will be used in place of the oral tablet dosage form. This procedure has well documented efficacy and will result in considerable cost savings. When given orally the mesna injection should be diluted with either a carbonated beverage, orange juice or apple juice.
- Valdecoxib (Bextra®), a newer COX-2 inhibitor, will be substituted with a therapeutically equivalent dose of rofecoxib (Vioxx®) when ordered for inpatient use.

Watch Out for Drug Names with Suffixes:
The list of drug names with suffixes such as LA, CR, SR, XT continues to grow. Potential life-threatening reactions can occur when drug orders do not include the suffix. One example is if the immediate-release formulation of nifedipine (Procardia® or Adalat®) is ordered in place of the sustained-released (Procardia XL® or Adalat CC®) dosage form. Other examples are listed below.
Aspirin EC
Cardizem CD
Depakote ER
Catapres-TTS-1
Bicillin LA
Detrol LA
Wellbutrin XL
Norpace CR
Tegretol XR
Sinemet CR
Augmentin XR

Antiemetic Preprinted Physician Order Forms Available Now:
In order to simplify product selection, provide some guidance to the treatment of nausea and vomiting and to promote rational prescribing, an Antiemetic Preprinted Order form (Form number 113-3112) is now available on all patient care units excluding pediatrics and ante-partum.
Visit the Pharmacy Website for Back Issues of the *PharmaGram*:
You can search for back issues of the *PharmaGram* at: http://library.osfsaintfrancis.org/druginfo.asp

ADE (Adverse Drug Event) Hotline: 655-6805

Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)
Parenteral Prochlorperazine (Compazine®) Now Available:
For about 2 years the parenteral form of prochlorperazine has been unavailable due to material shortages and production problems. During this interim period the Pharmacy and Therapeutics Committee had authorized an auto-substitution to promethazine (Phenergan®). Since prochlorperazine injection is now available again, this auto-substitution will now be abandoned.

Linezolid (Zyvox®) Interactions Associated with Monoamine Oxidase Inhibition:
Linezolid is an oxazolidinone class antibiotic usually reserved for use in treating infections caused by vancomycin-resistant *E faecium* or methicillin-resistant *S aureus*. Linezolid is also a reversible, nonselective inhibitor of monoamine oxidase and therefore has the potential for interactions with adrenergic and serotonergic agents. Some individuals receiving linezolid may experience a reversible enhancement of the pressor response to indirect-acting sympathomimetic agents, vasopressor or dopaminergic agents. Initial doses of adrenergic agents, such as dopamine or epinephrine, should be reduced and titrated to achieve the desired response. Over the past 3 years there have been at least 7 reports in the literature and one documented case here at SFMC of serotonin syndrome associated with the concomitant use of linezolid and a serotonin reuptake inhibitor (i.e. citalopram (Celexa®), sertraline (Zoloft®), paroxetine (Paxil®), fluoxetine (Prozac®)). Physicians should be alert to the possibility of signs and symptoms of serotonin syndrome (e.g. myoclonus, hyperreflexia, diaphoresis, shivering, tremor, diarrhea, incoordination hyperpyrexia, and cognitive dysfunction) in patients receiving such concomitant therapy.

Formulary Deletions and Autosubstitutions Approved:
- Mumps, trichophyton and candida antigens were deleted from the Formulary. Mumps antigen is no longer available and the other agents are rarely used.
- Oral ganciclovir (Cytovene®), used in the treatment of cytomegalovirus, was removed from the Formulary. This product has been unavailable and valganciclovir (Valcyte®), which has the same indications, is on the Formulary and offers better oral absorption. Ganciclovir for injection is still available and will remain on the Formulary.
- Griseofulvin (Fulvicin®), an older antifungal agent, is no longer available from the manufacturer and was deleted from the Formulary.
- Norco®, which is a combination of 325mg of acetaminophen and different strengths of hydrocodone may be substituted to same drug combination containing the equivalent amount of hydrocodone.
- In situations of an extreme drug shortage, betamethasone (Celestone®) 12mg IM daily x 2 doses may be switched to dexamethasone (Decadron®) 6mg IM BID x 4 doses for preterm deliveries in antepartum. Betamethasone is available but with maximum order limits.

Drug Shortages:
- Bacitracin, which is commonly used in surgery as an antibacterial irrigation, is currently not available. There is now only one manufacturer and they have been unable to maintain sufficient supplies.
- Despite improved supplies of Prevnar® pneumococcal vaccination, a letter from the manufacturer indicates the shortage will continue through June 2004. To help ensure adequate supplies, the CDC recommends suspending the 4th dose in healthy children.

ADE (Adverse Drug Event) Hotline: 655-6805

Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)
Warfarin (Coumadin®) Dosing Time Change:
Starting Monday, April 26th, the universal in-patient warfarin dosing time will be 1800. The 6-Sigma Coumadin® ADE Reduction Committee based this change on a review of clinical studies, a nursing survey showing dissatisfaction with the current dosing time of 1500, and a benchmarking survey of other facilities. If a physician wants to override the 1800 dosing time, he/she must write an order stating his/her preferred time.

Formulary Deletions, Autosubstitutions, and Denials:
- Nifedipine (Procardia®, Adalat®) regular-release capsules were deleted from the Formulary due to low usage and potential harm associated with their use.
- Cetacaine® spray (benzocaine/tetracaine) was deleted from the Formulary and benzocaine spray (Hurricane®) was approved as the autosubstitution. Significant cost savings and potential inappropriate reuse of a contaminated applicator tube were the reasons for this change.
- Human milk fortifier Similac® product will be switched to an equivalent Enfamil® product which contains iron resulting in reduced need for separate iron supplementation.
- Two alternatives to using the non-formulary one-quarter normal saline (NS) with sodium bicarbonate (i.e. Dextrose 5% with 150meq sodium bicarbonate or one-half NS with 70meq sodium bicarbonate) were approved. These alternative IV solutions are isotonic, use a base solution that are commercially available and reduce the potential for using hypotonic IV infusions.
- Paroxetine (Paxil®) autosubstitution for paroxetine controlled-release (Paxil CR®) was approved.
- Eplerenone (Inspra®) was denied Formulary status based on the presence of another aldosterone antagonist already on Formulary (i.e. spironolactone (Aldactone®)), significant cost difference, non-preferred status by outpatient insurers, and drug interaction warnings.

Drug Discontinuations:
The following drug products have been discontinued by their manufacturers and will no longer be available: chlorpromazine suppositories (25 and 100mg), aminophylline liquid and tablets, theophylline liquid and theophylline 450mg sustained-release tablets.

Mercaptopurine (Purinethol®) and Azathioprine (Imuran®) Metabolism Inhibition – Screening for a Genetic Deficiency:
There are individuals with an inherited deficiency of the enzyme thiopurine methyltransferase (TPMT) who may be unusually sensitive to the myelosuppressive effects of mercaptopurine or azathioprine and prone to developing rapid bone marrow suppression following the initiation of treatment. Substantial dose reductions may be required to avoid the development of life-threatening bone marrow suppression. Identification of these individuals is encouraged and is available through a blood test which can be ordered as ‘TPMT-RBC’ or Test Code ‘XC36.’

Only the Patient May Activate Patient-Controlled Analgesia (PCA):
The Pharmacy and Therapeutics Committee wishes to emphasize that caregivers, family members, or anyone other than the patient may not activate or administer analgesic doses using the PCA system. Only a patient, who has received proper instructions and judged capable, may activate the on-demand doses from a PCA.

Is There a Documented Reason for Each Medication Ordered?:
The Joint Commission Standard MM.3.10 states: Only medications needed to treat the patient’s condition are ordered. Be sure there is a documented diagnosis, condition, or indication-for-use for each medication ordered.

ADE (Adverse Drug Event) Hotline: 655-6805
Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)
**Community Acquired Pneumonia: Antibiotics Within 4 hours!**

Evidence based medicine tells us that *rapid* antibiotic initiation and appropriate antibiotic selection for community acquired pneumonia will result in a significant decrease in length of stay and improved outcomes for our patients. Based on a study of more than 13,000 patients, the 2004 update from the Infectious Disease Society of America reported that timeliness may be **MORE** important than antibiotic selection. Community acquired pneumonia is one of the quality indicators that will be monitored by the Joint Commission and the results of their findings will be shared publicly on a 'Report Card' of U.S. hospitals. Within 4 hours from hospital admission to antibiotic administration has been determined to be an acceptable target time.

**Things to Consider When Prescribing Enoxaparin (Lovenox®):**

- DVT prophylactic doses of 40mg once a day is the preferred dose for medical, general surgery, and stroke patients. Patients at high risk or undergoing total knee surgery may require enoxaparin 30mg every 12 hours.

- Minimal dosing information for obese patients weighing greater than 150 KG. Consider using unfractionated heparin, which can be monitored with PTTs.

- For patients with severe renal impairment (creatinine clearance <30 mL/min) the recommended dosages are 30mg daily for prophylaxis or 1mg/kg daily for treatment.

- DVT therapy: see www.tagpeoria.org for orders.

- Do not write 1 mg/kg by itself; include the total dose or provide the patient's weight.

- Round doses to the nearest 10mg (pre-filled syringes are 30, 40, 60, 80, 100, 120, 150mg)

**Darbepoetin (Aranesp®)Autosubstitution for Epoetin (Procrit®, Epogen®):** Darbepoetin and epoetin are two erythropoietin products that are currently on the Formulary and are approved for use in treating anemia. Since darbepoetin has a longer half-life and is significantly less expensive than epoetin, the P&T Committee approved a pharmacist autosubstitution of weekly injections of these products equivalent to 40,000 units of epoetin to 100mcg darbepoetin.

**FDA Defends Generic Equivalency:**

The Food and Drug Administration has made available a website (www.fda.gov/cder/) and a phone number (1-888-INFO-FDA) for people who want to know more about generic drugs and their equivalency to the trade name products.

**Safe Writing Habits: Avoid Unsafe Abbreviations:**

Do not use U (for units), IU (for international units), Q.D. (for daily), Q.O.D. (for every other day), drug abbreviations, trailing zeros (i.e. 5.0) or missing leading zeros (i.e. .5).

**ADE (Adverse Drug Event) Hotline: 655-6805**

**Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)**
Parenteral Prochlorperazine (Compazine®) Is Available:
For about 2 years the parenteral form of prochlorperazine has been unavailable due to material shortages and production problems. During this interim period the Pharmacy and Therapeutics Committee had authorized an auto-substitution to promethazine (Phenergan®) and pre-printed physician orders were changed to reflect the unavailability of this drug. The return of prochlorperazine injection is welcomed since it is a very effective antiemetic, with a low side effect profile in comparison to a number of other antiemetics and is less costly than the serotonin receptor antagonists (i.e. ondansetron (Zofran®, granisetron (Kytril®)).

NPO Orders- Don’t Forget to Hold the Scheduled Insulin!
Insulin glargine (Lantus®) is a product that delivers controlled insulin levels over a 24 hour period. In a recent review of insulin glargine usage here at Saint Francis Medical Center, there were 1426 vials dispensed over a 12 month period. During approximately this same period almost 250 patients required a hypoglycemic rescue medication (i.e. IV Dextrose or glucagon). Although the medical records were not individually reviewed for cause and effect, the Adverse Drug Event Reports completed by Quality Management indicate insulin glargine as a frequent cause of hypoglycemic events. The following case reported at the ADE Subcommittee illustrates how ‘easy’ a hypoglycemic event can occur. A patient admitted to the nephrology service was scheduled for an orthopedic procedure in the afternoon, and orders for NPO were written that morning. The patient received his usual insulin glargine that morning, went to the afternoon procedure and became hypoglycemic overnight. The patient was treated without further sequela.
In response to these episodes a warning message will appear on the Medication Administration Record with insulin glargine orders stating “HOLD if NPO.” Please remember to check for any scheduled insulin orders when writing orders for NPO and adjust insulin orders accordingly.

Drug Deletions and Autosubstitutions:
At the last Pharmacy and Therapeutics Committee meeting, the following actions were taken:
- Lente insulin was deleted due to very low usage and potential confusion with Lantus® insulin.
- Fluticasone (Flonase®) was approved as the ‘preferred’ intranasal corticosteroid, based on efficacy, frequency of administration, cost and approved use in children and adults. An autosubstitution of all other intranasal corticosteroids to fluticasone by pharmacists was approved.
- An autosubstitution for the newest HMG Co-A Reductase Inhibitor, rosuvastatin (Crestor®), to atorvastatin (Lipitor®) was approved to allow time to evaluate for potential, unknown side effects of rosuvastatin.

New ‘Dosage Range’ Order Policy Approved:
A new policy regarding drug orders with dose or frequency ranges (ex. Acetaminophen 325-650mg q3-4hrs prn) will be implemented. The recommended interpretation of such orders will be to use the lowest dose initially (a higher dose may be used for analgesic orders if the pain scale score is greater than 5 and risk of adverse effect is low). An additional incremental dose may be given if needed, but this dose is not to exceed the maximum dose per range and time period. Using the example, a 325mg tablet would be used as the initial dose (unless the pain is ‘severe’). If an additional acetaminophen dose is needed within 3 hours of the initial dose, then only one other 325mg tablet may be given. A prescription using a dosing interval range (ex. q 3-4 hrs) will use the shortest time interval indicated. In the example above, every 3 hours prn will be range implemented.

ADE (Adverse Drug Event) Hotline: 655-6805
Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)
Nebulized Levalbuterol (Xopenex®) Formulary Restriction and Autosubstitution:
When levalbuterol nebulized solution was originally reviewed by the Pharmacy and Therapeutics Committee, it appeared that prescribing would be limited and, therefore physicians were not required to follow the usual procedure for requesting this non-formulary drug. However usage and costs have significantly escalated over the past several months. After a critical evaluation of the literature showing no greater clinical benefits or lowered risks with levalbuterol use compared to (racemic) albuterol, the Committee decided to restrict the use of this drug by providing an autosubstitution of levalbuterol to nebulized albuterol. Physicians wishing to use levalbuterol for adult patients will need to follow usual procedures of completing a Non-Formulary Request form and contacting the P&T Committee Chairman for approval. The procedure for pediatrics will not change, although an additional Drug Use Evaluation form will need to be completed at the time of prescribing.

Parenteral Pantoprazole (Protonix®) Reformulated and Administration Changes:
Parenteral pantoprazole has been available as a lyophilized powder, which once reconstituted required an inline filtered when administering as an intermittent IV infusion. This product has now been reformulated which eliminates the need for a filter. This product has also been approved for administration as a 2 minute IV push, which eliminates the need for a minibag.

Your Pharmacy and Therapeutics (P&T) Committee and the Drug Formulary:
The P&T Committee consists of 31 physicians and 8 members who represent support services and hospital administration. Maintenance of the Drug Formulary is among several areas of responsibility of this Committee. Physicians may request a drug to be added to the Formulary by completing a Formulary Addition Request form which is available from the Pharmacy Department or online at http://library.osfsaintfrancis.org/druginfo.asp. The Drug Analysis Work Group (DAWG) Subcommittee researches and reviews each drug request. Using a balanced scorecard approach which considers efficacy, safety, patient's acceptance and cost, this Subcommittee makes recommendations to the P&T Committee for drug product approval, denial or removal. If judged by a patient's physician to be clinically necessary, a one-time or one patient use of a non-Formulary product may be requested by the prescribing physician by completing a Non-Formulary Request form (available from the Pharmacy Department or at the online site listed above) and contacting the P&T Committee Chairman.

Who Wrote That Order?:
Handwriting has sometimes been the topic jokes, but when it comes to ordering procedures and drug therapy in healthcare, it could have life or death consequences. It is critically important for the people carrying out those orders to know who wrote them in case questions arise in interpretation. Unfortunately with the introduction of the new IDX computer system in October, dictation numbers won’t be listed in the system. However, clinicians will be assigned IDX identification numbers. Besides a signature, we need a way to clearly identify the person writing an order. We are asking for your suggestions and ideas in a poll.

What procedure would you like to see to identify persons writing orders?
1) Printing your name along with the signature, 2) Using a print stamp, 3) Using IDX identification number, or 4) Some other suggestion.
Give your choice by leaving a message with either Jerry Storm at 655-3489 or Ed Rainville at 655-7331.

ADE (Adverse Drug Event) Hotline: 655-6805
Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)
Formulary Additions and Autosubstitutions:
The following were approved by the Pharmacy and Therapeutics Committee for addition to the Formulary:

- Pimecrolimus (Elidel®) – this product offers a therapeutic alternative to topical corticosteroids in the treatment of atopic dermatitis, allergic contact dermatitis and psoriasis.
- Pentosan Polysulfonate (Elmiron®) – useful in the treatment of interstitial cystitis.
- Acetylcysteine, injection (Acetadote®) – the first parenteral acetylcysteine product for treating acetaminophen overdoses to be approved in the United States. Currently this dosage form is still considered as a secondary alternative to the orally administered product due to potential significant side effects. However, Policy and Procedures related to this new formulation are being reviewed.
- Fluvastatin XL (Lescol XL®) has been approved to be substituted with pravastatin (Pravachol®).

Formulary Deletions, Addition Denials and Drug Discontinuations:
The following drug products were voted on by the Pharmacy and Therapeutics Committee for either Formulary deletion, denial for addition, or Formulary removal because of discontinuation by the manufacturer.

- Sodium Chloride 5% - low usage and availability of 3% parenteral solution.
- Amitriptyline (Elavil) injection – low usage.
- Zinc nasal gel (Zicam®) – denied addition due to significant side effect profile.
- Gefitinib (Iressa®) – denied addition due to anticipated low use.
- Beta carotene – discontinued by manufacturer. Retinol (Vitamin A) is still available.
- Dicloxacillin oral susp (Dynapen®) – discontinued by manufacturer. An alternative is being reviewed.
- Mesoridazine (Serentil®) – discontinued by manufacturer.
- Epinephrine ophthalmic drops (Epifrin®) – discontinued by the manufacturer.
- Thiethylperazine (Torecan®) – discontinued by the manufacturer.

New 2005 Hospital National Patient Safety Goals:
Just as you were getting familiar with the 2004 Patient Safety Guidelines, the new 2005 Goals have now been announced. The former Goals have either been incorporated into the current Joint Commission Standards of Practice and/or are repeated in the 2005 Goals. The new information is provided below:

- Measure, assess and, if appropriate, take action to improve the timeliness of reporting, and the timeliness of receipt by the responsible licensed caregiver, of critical test results and values.
- Identify and, at a minimum, annually review a list of look-alike/sound-alike drugs used in the organization, and take action to prevent errors involving the interchange of these drugs.
- Accurately and completely reconcile medications across the continuum of care.
- Reduce the risk of patient harm resulting from falls.

Avoid Medication Errors: Don’t Use These Abbreviations:

<table>
<thead>
<tr>
<th>Banned Abbreviations</th>
<th>Potential Problem</th>
<th>Preferred Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>U (for unit)</td>
<td>Mistaken as zero, four or cc.</td>
<td>Write “unit”</td>
</tr>
<tr>
<td>IU (for international unit)</td>
<td>Mistaken for IV (intravenous) or 10</td>
<td>Write “international unit”</td>
</tr>
<tr>
<td>Q.D., Q.O.D.</td>
<td>Mistaken for each other or Q.I.D.</td>
<td>Write “daily” or “every other day”</td>
</tr>
<tr>
<td>Trailing zero (X.0mg)</td>
<td>Decimal Point Missed</td>
<td>Never write trailing “0”</td>
</tr>
<tr>
<td>Lack of leading zero (.Xmg)</td>
<td>Decimal Point Missed</td>
<td>Use “0” before decimal point</td>
</tr>
<tr>
<td>MS, MSO4,MgSO4</td>
<td>Confused for one another (morphine or magnesium sulfate)</td>
<td>Write out morphine or magnesium sulfate.</td>
</tr>
</tbody>
</table>

ADE (Adverse Drug Event) Hotline: 655-6805
Formulary Additions and Autosubstitutions:

The following were approved by the Pharmacy and Therapeutics Committee for addition to the Formulary:

- Ocuvite Lutein® – this product will provide 6 mg per dose of lutein, which is a dihydroxycarotenoid, used as a preventative for cataracts and age-related macular degeneration.
- Memantine (Namenda®) – used alone or in combination with other drugs in the treatment of moderate to severe Alzheimer’s disease.

Autosubstitutions and Formulary Addition Denials:

- Tiotropium (Spiriva®), a long-acting anticholinergic bronchodilator, was denied formulary addition based on the lack of clinical studies in acute care and cost of the product. Nebulized respiratory products are frequently the preferred inhalation dosage form used in acute care settings. The P&T Committee approved an autosubstitution of tiotropium to ipratropium (Atrovent®) 2 puffs four times a day.
- Cinacalcet (Sneppir®), is a calcimimetic compound used in the treatment of hypercalcemia in patients with parathyroid carcinoma. This drug was denied Formulary addition due to predicted low use at the present time.

Handling Oral Cytotoxic Drugs:

The Pharmacy will place a warning label stating ‘CYTOTOXIC MATERIAL’ on all ORAL dosage forms of drugs that qualify. This warning is intended to avoid nurses or others from crushing tablets or opening capsules and possibly exposing themselves and others to potential toxicities. Gloves and face masks must be used when opening capsules or crushing tablet dosage forms of these products. A biowaste container must be used to dispose of materials leftover from drug preparation. A list of these products is available from the Pharmacy.

Watch Out for Drug Names with Suffixes:

The list of drug names with suffixes such as LA, CR, SR, XT continues to grow. Potentially life-threatening reactions can occur when drug orders do not include the suffix. One example is if the immediate-release formulation of nifedipine (Procardia® or Adalat®) is ordered in place of the sustained-released (Procardia XL® or Adalat CC®) dosage form. Other examples are listed below.


ADE (Adverse Drug Event) Hotline: 655-6805
Formulary Denial:

Teriparatide (Forteo®), a parenteral drug indicated for the treatment of osteoporosis, was denied Formulary addition due to the forecast of low usage, limited dosage forms available and cost.

Who Wrote That Order?... Use Your IDX User Number and Signature:

There has been much discussion about how to identify the author of written orders other than by a (sometimes unreadable) signature. This issue was raised in the July PharmaGram, with several people responding and offering their thoughts and opinions. The final administrative decision was made in favor of using the IDX USER NUMBER, along with the prescriber’s signature. Each physician has been assigned their own individual IDX User Number, which is cross-referenced in the IDX CareCast System.

Information On Drug Shortages:

For information on drug shortages check the Saint Francis Medical Center Pharmacy’s webpage at http://library.osfsaintfrancis.org/druginfo.asp. A link to the American Society of Health-System Pharmacists’ Drug Product Shortages Management Resource Center is available with information that is updated regularly. This site lists drug products which are in short supply, the manufacturer’s reason(s) for the shortage, the anticipated resupply date, and possible alternative choices.

Dangerous Look-Alike, Sound-Alike Drug Product Names:

The following is a list of drugs that have commonly been confused with one another because their names either look or sound alike. Through the National Patient Safety Goals, the Joint Commission now requires each healthcare institution to outline procedures to avoid medication errors resulting from similar product names. Many procedures have already been implemented and future issues of the PharmaGram will offer additional suggestions to physicians, nurses and persons who may handle these drug products.

<table>
<thead>
<tr>
<th>Cisplatin (Platinol®)</th>
<th>Carboplatin (Paraplatin®)</th>
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</thead>
<tbody>
<tr>
<td>Ephedrine</td>
<td>Epinephrine (Adrenalin®)</td>
</tr>
<tr>
<td>Fentanyl (Sublimaze®)</td>
<td>Sufentanil (Sufenta®)</td>
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<tr>
<td>Hydromorphone (Dilaudid®)</td>
<td>Morphine</td>
</tr>
<tr>
<td>Insulin glargine (Lantus®)</td>
<td>Insulin Zinc suspension (Lente®)</td>
</tr>
<tr>
<td>Lilly Human Insulin products (Humulin®)</td>
<td>Insulin Lispro (Humalog®)</td>
</tr>
<tr>
<td>Novo Nordisk Human Insulin products (Novolin®)</td>
<td>Insulin Aspart (Novolog®)</td>
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<tr>
<td>Paclitaxel (Taxol®)</td>
<td>Docetaxel (Taxotere®)</td>
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<td>Glimepiride (Amaryl®)</td>
<td>Galantamine (Reminyl®)</td>
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<td>Warfarin (Coumadin®)</td>
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<td>Terbinifine (Lamisil®)</td>
<td>Lamotrigine (Lamictal®)</td>
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<td>Olanzapine (Zyprexa®)</td>
<td>Cetirizine (Zyrtec®)</td>
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<tr>
<td>Simvastatin/ezetimibe (Vytorin®)</td>
<td>Acetaminophen/hydrocodone (Vicodin®)</td>
</tr>
</tbody>
</table>
ADE (Adverse Drug Event) Hotline: 655-6805
Linezolid (Zyvox®) Interaction with Selective Serotonin Reuptake Inhibitors (SSRIs):

Linezolid is an oxazolidinone class antibiotic usually reserved for use in treating infections caused by vancomycin-resistant *E. faecium* or methicillin-resistant *S. aureus*. Linezolid is also a reversible, nonselective inhibitor of monoamine oxidase and therefore has the potential for interactions with adrenergic and serotonergic agents. Some individuals receiving linezolid may experience a reversible enhancement of the pressor response to indirect-acting sympathomimetic agents, vasopressor or dopaminergic agents. Initial doses of adrenergic agents, such as dopamine or epinephrine, should be reduced and titrated to achieve the desired response. There has now been four reported cases here at SFMC of serotonin syndrome associated with the concomitant use of linezolid and an SSRI (i.e. citalopram (Celexa®), sertraline (Zoloft®), paroxetine (Paxil®), fluoxetine (Prozac®). Physicians should be alert to the possibility of signs and symptoms of serotonin syndrome (e.g. myoclonus, hyperreflexia, diaphoresis, shivering, tremor, diarrhea, incoordination hyperpyrexia, and cognitive dysfunction) in patients receiving such concomitant therapy.

Standardized Concentration for Continuous Insulin Infusions:

In order to reduce the potential for error and in compliance with Joint Commission Standards, a consensus was reached with several medical services to standardize the concentration of insulin infusions to 1 unit/ml. Insulin infusions in the Neonatal Intensive Care are an exception because of the special patient requirements. The standard adult IV solution consists of 250 units of human, regular insulin in 250ml Normal Saline.

Use the Oral Route for Potassium Replacement Whenever Possible:

Intravenous administration of potassium is associated with greater, and potentially more severe, side effects when compared to the oral route. Oral administration of potassium is safer and should be considered whenever possible. New guidelines for intermittent IV administration of potassium doses limit the infusion for non-telemetry monitored patients to 10meq/hr for adults and 0.5meq/meq/hr for children.

Drug Shortages and Recalls:

**Rofecoxib (Vioxx®)** was recently recalled by the manufacturer in response to an increase in cardiovascular events (i.e. strokes and myocardial infarctions) noted in a study they were conducting. Because of this action, the Pharmacy and Therapeutics Committee approved celecoxib (Celebrex®) to the Formulary and established an autosubstitution for valdecoxib Bextra®).

**Influenza Vaccine** manufactured by Chiron Pharmaceuticals, which represents about half of the anticipated supply for this season will not be available. The Peoria City County Health Department has been coordinating efforts with other County Health Departments and medical facilities to account for all available vaccine doses and provide criteria for distribution.

**Methylprednisolone IV (SoluMedrol®) and betamethasone (Celestone®)** supplies are more readily available. Autosubstitution to dexamethasone has been discontinued for both of these drugs.

**Kaopectate® Drug Deletion:**

Kaopectate®, which originally contained kaolin and pectin, has been re-formulated several times and it now contains bismuth subsalicylate (same as PeptoBismol®). Because of the confusion resulting from ingredient changes, the P&T Committee has decided to delete this product from the Formulary.

**Magnesium Hydroxide (Milk of Magnesia) is Available in Concentrated Form Only**

Milk of magnesia (aka MOM) is only available as a TRIPLE concentration solution within the medical center. Orders that do not specify ‘Concentrated’ will be autosubstituted by the pharmacist to the triple-concentrated product using one-third of the ordered volume.

**Reminder: Use Your IDX User Number and Signature for Orders**

ADE (Adverse Drug Event) Hotline: 655-6805
Formulary Additions and Denials:

- Rivastigmine (Exelon®) used in the treatment of Alzheimer ’s disease was added to provide a therapeutic alternative to patients not responding adequately to other therapies. Common side effects of this medication have included nausea, vomiting, diarrhea, anorexia, dyspepsia, abdominal pain, weight loss, headache, asthenia, dizziness, fatigue, and malaise.
- Ciprofloxacin ophthalmic solution 0.3% (Ciloxan®) added since the generic version is less costly. The most common adverse effects observed with this preparation are conjunctival irritation, increased lacrimation, keratitis, and papillary conjunctivitis.
- Terbinafine (Lamisil®) an antifungal was denied addition due to low frequency of in-patient use, other drugs available on Formulary (ex. itraconazole (Sporonox®), and out-patient Formulary considerations.

Concentrated Electrolyte Administration Policy Changes:

There have been some changes made for administering intravenous concentrated electrolytes (i.e. Potassium Phosphate and Chloride, Calcium Gluconate and Chloride, Sodium Phosphate, and Magnesium Sulfate). Two procedural changes specific to General Care Units are the following:

Peripheral administration of potassium chloride bolus infusions will be limited to a rate of 10meq/hr if the patient is not on telemetry and 20meq/hr (1meq/kg/hr for pediatrics) if on telemetry.

Peripheral administration of calcium gluconate boluses will be prepared by Pharmacy at a concentration of either 1-3gm in 100ml or 3-5gm in 250ml (for pediatrics use a 1:2 dilution with 5% dextrose) and a maximum infusion rate of 3gm per hour (240mg/kg/hr for pediatrics). Calcium chloride will be reserved for central line administration only and emergency use on the General Care Units.

The Nursing Drug Matrix contains these and other IV guidelines. Refer to the Nursing Protocols and Procedures under Hospital Standards on the SFMC Intranet site or use the URL address:


Darbepoetin (Aranesp®) Autosubstitution for Epoetin (Procrit®, Epogen®):

Darbepoetin is an epoetin analogue used for erythropoiesis stimulation and was formulated to have a longer half-life than epoetin alpha. The P&T Committee approved pharmacists’ autosubstituting orders for 20,000 units or greater of epoetin to darbepoetin based on significant cost savings and equal therapeutic efficacy. Listed below is a suggested autosubstitution for epoetin doses less than 20,000 units that physicians may consider:

<table>
<thead>
<tr>
<th>Epoetin (Procrit®, Epogen®)</th>
<th>Darbepoetin (Aranesp®)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2,500 units/week</td>
<td>6.25 mcg/week</td>
</tr>
<tr>
<td>2,500 – 4,999 units/week</td>
<td>12.5 mcg/week</td>
</tr>
<tr>
<td>5,000 – 10,999 units/week</td>
<td>25 mcg/week</td>
</tr>
<tr>
<td>11,000 – 17,000 units/week</td>
<td>40 mcg/week</td>
</tr>
<tr>
<td>18,000 – 33,999 units/week</td>
<td>60 mcg/week</td>
</tr>
</tbody>
</table>

Consolidation of Intravenous Theophylline Products:

With decreased utilization of IV theophylline, the Pharmacy will now stock only the 800mg in 250ml solutions.

Hyaluronidase (Amphadase®) is Now Commercially Available:

Hyaluronidase 150 units/ml is now available as Amphadase® for treating certain types of extravasations and ophthalmologic procedures.
Reminder: *Please* Use Your 5-digit IDX User Number and Signature for Orders

ADE (Adverse Drug Event) Hotline: 655-6805

Drug Information Service – 655-2382 (Mon-Fri; 8am – 4pm)