

P & T News

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GUIDELINES FOR COMPLETE, SAFE, AND ACCURATE DISCHARGE AND OUTPATIENT PRESCRIPTION WRITING

One of the primary communication links between the prescriber, pharmacist, and patient is complete, safe, and accurate prescription writing. Completion of all "essential elements" of a prescription will assure that it is accurately interpreted and not subject to alteration. Attention to detail when writing prescriptions will prevent the need for the Department of Pharmaceutical Care to contact the prescriber to clarify prescriptions and will reduce patient delays. Properly written prescriptions will help ensure continuity of care in the patient's local community.

| | | | | |
|---|--|--|---|-----------|
| FOR PHARMACY USE | | NAME | Joe Smith | |
| | | PATIENT NO. | 88-12345-6 | |
| | | ADDRESS | 777 Oak Street | |
| ATTENTION PHARMACIST: SEE REVERSE SIDE BEFORE FILLING | | UNIVERSITY OF IOWA HOSPITALS AND CLINICS IOWA CITY, IOWA PHONE (319) 335-1918 | Anytown, IA | 51234 |
| | | PHARMACY DEPARTMENT PHONE (319) 335-3377 | DATE | BIRTHDATE |
| | | | 8-4-05 | 7-7-77 |
| DRUG SOURCE | Drug Allergies | B DRUG: | STRENGTH: | |
| LOT NO. | <input type="checkbox"/> NKA or Specify: | Acetaminophen with Codeine | 300mg/30mg | |
| EXP. | Aspirin | QUANTITY: | <input type="checkbox"/> PREPACKAGE | |
| Rx STAFF | G | C20 (twenty) | <input checked="" type="checkbox"/> EXACT | |
| | | (Insert Quantity Above and Check Box At Right) | | |
| 730735 | INDICATE INSURER: | D SIG: One tablet every 4 hours | | |
| CONTAINERS WITHOUT SAFETY CLOSURES <input type="checkbox"/> | <input checked="" type="checkbox"/> UI CARE / SELECT | PRN pain | | |
| Refill <u>ONE</u> times | OTHER | J INDICATION FOR USE: | | |
| Until <u>9-4-05</u> (date) | | broken leg | | |
| OR No Refills (circle) | P.A. SUPERVISING PHYSICIAN NAME: | E SIGNATURE | Charles S. Brown | |
| | | PRINT NAME: | Charles S. Brown | |
| | | DEA REG. NO.: | AB0000000 F | |
| | | REQUIRED FOR CONTROLLED DRUGS | | |



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DUPLICATE PRESCRIPTION SYSTEM

The Duplicate Prescription System at UIHC is structured to produce an original and exact copy of the medication order. Under this system, the Department of Pharmaceutical Care is authorized to dispense a take-home supply of medication from the **copy** of the prescription and **return the original prescription to the patient** to obtain continuing supplies in the local community. These duplicate blanks are also available in a format compatible with the UIHC computer-based patient record for on-line generation of prescriptions. **The use of other, nonstandard prescription blanks within UIHC is not authorized.**

The "essential elements" of a prescription are depicted in the preceding figure of a UIHC prescription and described below:

A Patient Name, Hospital Number, Birthdate, and Date Prescription Is Written

This information may be transmitted to the prescription by using the patient's addressograph plate. The hospital number is essential to ensure that the intended patient receives, and is billed for, the correct medication.

B Name and Strength of Drug

Medications should be ordered by the generic name, not by the proprietary or trade names. Hospital policy and the Joint Commission on Accreditation of Healthcare Organizations standards **permit the use of drug name abbreviations in medication orders only if the abbreviation has been specifically approved by the hospital and it appears on a published list.** "Coined" abbreviations such as HCTZ, AZT, T3, PCN, U, and ddC are not acceptable medical abbreviations, may be misinterpreted, and may cause drug errors. Medication orders that contain nonapproved drug name abbreviations are not valid. Pharmacists are authorized to withhold dispensing of medications ordered via nonapproved abbreviations. The approved drug name abbreviations are provided on the on-line *Formulary and Handbook* — www.healthcare.uiowa.edu/Pharmacy/Formulary/Form/16ApprovedDrug.html (see Table 1); approved medical abbreviations are available at www.healthcare.uiowa.edu/Pharmacy/Formulary/Hand/11MedAbbr.html, and dangerous medical abbreviations that may not be used at UIHC are listed at www.healthcare.uiowa.edu/Pharmacy/Formulary/Form/dangerousmedicalabbrev.html.

A separate prescription blank must be used for each drug prescribed. Multiple prescriptions on a single blank are unsafe and greatly increase the potential for medication errors.

C Quantity to Be Dispensed

The quantity of drug to be dispensed should be indicated. The quantities dispensed to most patients are generally limited to a maximum 30-day supply with continuing supplies to be prescribed as refills. In order to minimize patient delays, the pharmacist is authorized to round the quantity dispensed to the nearest available prepackage quantity (usually a one-month supply) only for prescriptions with refills authorized.

For Drug Enforcement Administration (DEA) designated controlled substances, including narcotics and anabolic steroids, the quantity should be written in words as well as numbers to prevent alteration of the prescription.

Outpatient Prescription Medication Supply and Refill Limits

1. Supply quantities are generally limited to a 30-day supply except where health plan benefits allow a greater supply. Patients being discharged from the hospital may receive an initial supply of medications. Refills are limited to the cases noted below.
2. Refill prescriptions may be processed for:
 - Patients receiving their on-going primary care from UIHC (i.e., generally local area residents as refills must be picked up from UIHC).
 - Hospital staff and dependents at the same address.
 - Prescriptions for medications which are not commercially available.
 - Employees of the University of Iowa.

D Directions to the Patient

Clear and concise directions will assist your patient in the appropriate use of the medication. **"Take as directed" should be avoided.** Your patient may forget or confuse verbal directions or lose a separate note. The Department of Pharmaceutical Care will complete a patient medication calendar for tapered or intermittent dosage schedules. The "PRN" designation should include the purpose of the medication (e.g., PRN sleep, PRN pain).

E Signature, Printed Name, Physician Code

In addition to signing the prescription, print your name legibly below your signature along with your UIHC 4-digit prescriber code, and indicate your practitioner status by circling the appropriate initials to the right of the signature line. This will facilitate communications with health care practitioners throughout the state who have a need to accurately identify the prescriber, and it will also decrease the possibility of forgery. Additionally, Board of Pharmacy rule 657 I.A.C. 8.14(1) requires that the name of the prescriber appear on the prescription label. If the prescriber's signature is illegible and the identity of the prescriber is unknown, the prescription cannot be filled until the prescriber has been identified. This provision will result in telephone calls to your department and delays to patients. To prevent illegal drug diversion, supplies of prescription blanks may not be signed by the prescriber in advance of use. Prescriptions must only be signed by the prescriber at the time prescriptions are written for a specific patient. Physician assistants must also indicate the name of their supervising physician in the designated space.

F DEA Number

Your personal Drug Enforcement Administration (DEA) registration number (or the UIHC DEA registration number for eligible practitioners) with your personal 4-digit prescriber code (CLP number) must be included on all prescriptions for drugs classified as controlled substances. This step is a safety mechanism to prevent prescription forgery because each DEA number can be checked to verify its validity. When your DEA

number is omitted, it is illegal for any pharmacy to fill the prescription. Pharmacy does not have a list of every prescriber's DEA number; therefore, this omission causes your patient to be inconvenienced until the deficiency is corrected.

Physician assistants and advanced registered nurse practitioners are authorized to prescribe controlled substances after obtaining a mid-level practitioner's registration from the DEA. However, physician assistants are not authorized to prescribe Schedule II substances listed as stimulants or depressants in Iowa.

Assistance in obtaining the application forms for State and Federal registration is available at the Pharmacy Administrative Office, Room CC-101 GH. For additional information, see the on-line *Formulary and Handbook* — www.healthcare.uiowa.edu/Pharmacy/Formulary/Form/FedDEARegistrationProcess.html.

G Drug Allergies

The patient's medication allergies should be specified in this space on one of the prescriptions for each set of prescriptions. If there are no known allergies, please check the box next to "NKA." The pharmacist will obtain or confirm allergy information with the patient as necessary at the time the prescription is presented to the Ambulatory Care Pharmacies.

H Containers Without Safety Closures

"Childproof" containers with safety closures are used for dispensing all prescription medications (with limited exceptions) in accordance with the Federal Poison Prevention Packaging Act of 1970. You may indicate the need for nonsafety closures for a patient for whom childproof containers may cause difficulty by checking the designated box.

I Refill Designation

Always circle "no refills" or specify the number of times and/or the last date the prescription may be refilled. "PRN" is not a valid refill designation.

Prescriptions may be refilled at the Department of Pharmaceutical Care ONLY if certain criteria are met (see page 10). Prescriptions for these eligible patient groups (excluding controlled substances) may be refilled a maximum of 11 times or for 12 months - whichever is less. Prescriptions for DEA controlled substances in Schedules III, IV, and V may be refilled a maximum of 5 times or for 6 months - whichever is less. Prescriptions for Schedule II controlled substances may **not** be refilled.

J Indication for Use

The indication for use should be specified in this space for each prescription. This information permits the pharmacist to reinforce physician instructions with the patient and helps the patient understand the purpose for the medications. Federal regulations require the pharmacist to obtain information on the patient's disease state(s) so that appropriate utilization review and counseling can occur.

Table 1. Drug Name Abbreviations Approved for Use at UIHC

| Abbreviation | Generic Name | Abbreviation | Generic Name |
|---|---|--------------------------------------|--|
| Medications | | Vaccines, Toxoids, Skin Tests | |
| ASA | Aspirin | BCG Vaccine | BCG Vaccine |
| B&O Suppository | Belladonna and Opium Suppository | DTaP Vaccine | Diphtheria and Tetanus Toxoids and Acellular Pertussis Vaccine |
| ECASA | Enteric Coated Aspirin | DTP Vaccine | Diphtheria and Tetanus Toxoids and Pertussis Vaccine |
| ETOH | Ethyl Alcohol | DT Vaccine | Diphtheria and Tetanus Toxoid (for pediatric use) |
| INH | Isoniazid | Hep A Vaccine | Hepatitis A Vaccine |
| MOM | Milk of Magnesia | Hep B Vaccine | Hepatitis B Vaccine |
| Nitropatch | Nitroglycerin Patch | Hib Vaccine | Haemophilus influenzae b Vaccine |
| Nitropaste | Nitroglycerin Ointment | IPV Vaccine | Polio Virus Vaccine, Inactivated |
| NPH Insulin | Isophane Insulin Suspension | MMR Vaccine | Measles, Mumps, Rubella Virus Vaccine Live |
| NSAID | Nonsteroidal Anti-inflammatory Drugs | OPV Vaccine | Poliovirus Vaccine Live, Oral |
| NTG | Nitroglycerin | PPD Skin Test | Tuberculin Purified Protein Derivative |
| PVP-Iodine | Povidone-Iodine | Td Vaccine | Diphtheria and Tetanus Toxoids (for adult use) |
| SSRI | Selective Serotonin Reuptake Inhibitors | | |
| Intravenous Fluids* | | Vitamins | |
| D5W | Dextrose 5% in water | Vit A | Retinol |
| NS | 0.9% NaCl in water | Vit B12 | Cyanocobalamin |
| LR | Lactated Ringer's Injection | Vit B6 | Pyridoxine |
| D5 1/4NS | Dextrose 5% and NaCl 0.2% in water | Vit B2 | Riboflavin |
| D5 1/2NS | Dextrose 5% and NaCl 0.45% in water | Vit B1 | Thiamine |
| D5 LR | Dextrose 5% in Lactated Ringer's Injection | Vit C | Ascorbic Acid |
| D5 1/2NS with 20 mEq KCl/L | Dextrose 5% and NaCl 0.45% and KCl 20 mEq per liter | Vit D2 | Ergocalciferol |
| | | Vit E | Tocopherol |
| | | Vit K1 | Phytonadione |
| *Note: Other combinations of the above abbreviations may be used. | | | |
| Most Standard International Chemical Formulas (e.g., NH ₃ , KCl) are also acceptable. Note that MgSO ₄ may not be used. | | | |

HANDWRITING LEGIBILITY

Several national organizations, including the American Medical Association, the Institute of Medicine, the Institute for Safe Medication Practices, and the Joint Commission for Accreditation of Healthcare Organizations, have warned healthcare providers about the association between poor prescriber handwriting and medical errors. Prescription orders written hurriedly and illegibly force other care providers to seek order clarifications or inadvertently lead the care provider to erroneously interpret the order and give medication in a manner not intended by the prescriber. To avoid errors caused by illegibly written orders, the following should be observed:

- All aspects of handwritten prescription orders must be clearly written using a ballpoint pen. Felt tips and fountain pens do not generate sufficient pressure to transmit the order to the duplicate copy of the UIHC prescription blank.
- Care should be taken when prescribing drugs with look-alike names, especially when handwritten (examples include Inderal vs. Isordil, Lantus vs. Lente, or Humulin vs. Humalog). Drug names should be legibly printed.
- Avoid the use of drug name abbreviations and minimize the use of medical abbreviations as these may be misread or misinterpreted (for example, "qod" may be misinterpreted as "qid," resulting in a significant drug overdose). The UIHC has developed a list of dangerous medical abbreviations that may not be used (<http://www.healthcare.uiowa.edu/pharmacy/formulary/Form/dangerousmedicalabbrev.html>). Write instructions in complete English.
- Prescriber signatures and CLP codes should be clearly legible, not simply recognizable.

Additional information about safely writing medication orders may be reviewed at the Institute for Safe Medication Practices web site (www.ismp.org).

ELECTRONICALLY GENERATED PRESCRIPTIONS

The INFORMM Patient Record (IPR) allows UIHC prescribers to generate prescriptions electronically by using the Medication List function. Prescriptions can be printed out locally or sent electronically to the ambulatory care pharmacy-of-choice. These prescriptions maintain the duplicate system (original and copy) that has been employed at UIHC for over 25 years.

Several features of the IPR system are advantageous: 1) prescriptions generated by IPR are later accessible in the patient's profile under Medication List; 2) legibility is clear by virtue of the prescriptions being type-printed; and 3) prescriber signatures are "electronically" provided, therefore also legible. The legibility of both the prescription information and the signature promotes patient safety and convenience for patients and results in fewer follow-up phone calls to prescribers.

The system also affords several security features. In addition to the electronic signature, each prescription has its own printed security number. This number is generated by IPR and can later be entered into INFORMM by a UIHC ambulatory care pharmacist to verify the prescription's authenticity. Additionally, the paper stock used is watermarked. Finally, outside pharmacies may call the Department of Pharmaceutical Care (phone number is provided on the prescription) to verify the authenticity of the prescription.

Prescriptions for controlled substances can be generated by the IPR Medication List function, although electronic signatures are prohibited. Prescribers must provide a handwritten signature on the original portion and on the "copy" portion if refills have been indicated. **Controlled substance prescriptions cannot be sent electronically to the ambulatory care pharmacies; rather, they must be printed out locally so that the prescriber can sign them.**

DISCHARGE PRESCRIPTIONS FOR INPATIENTS

Prescriptions for discharge medications should be in writing as all patients must be given the option of taking their prescriptions to their community pharmacy or having an initial supply filled by the UIHC Ambulatory Care Pharmacies. This should be determined 24 hours prior to discharge to allow time for the prescriptions to be filled at the UIHC Ambulatory Care Pharmacies if the patient chooses this option. Failure to determine the need to have prescriptions filled at UIHC until the day of discharge can lead to delays in the patient's discharge and dissatisfaction with their stay. Payment for prescriptions is required at the time of discharge. **Use of generics or most cost-effective therapy is recommended.**

TELEPHONED PRESCRIPTIONS

All UIHC physicians, dentists, physician assistants, and advanced registered nurse practitioners may telephone prescriptions for UIHC clinic patients to the UIHC Ambulatory Care Pharmacies during normal clinic operating hours. In order to provide optimal service to our patients and minimize the potential for transcription errors, only small groups of prescriptions should be phoned to the pharmacy. Larger groups (more than 4) should be in writing or generated via the IPR Medications List function.

The majority of patients being discharged from UIHC will not utilize the UIHC Ambulatory Care Pharmacies as their primary pharmacy and will require a written or verbal prescription for their local pharmacy. Prescriptions for patients being discharged from the hospital must be in writing, as this ensures patients their legal right to choose where to have their prescriptions filled. Should the patient choose to have an initial supply of medications filled at UIHC, the inpatient pharmacist following the patient will review the patient's medication profile and counsel the patient about any prescribed home-going medication therapy at bedside before discharge from the hospital.

Registered nurses and pharmacists acting as an agent of a physician may also transmit prescription orders for clinic patients to the UIHC Ambulatory Care Pharmacies.

UNUSED SUPPLIES OF MEDICATION

Iowa law mandates that for the protection of the public health and safety, prescription drugs and devices, controlled substances, and items of personal contact nature may be returned to the pharmacy for reuse or resale only as herein provided:

- **Integrity maintained.** Prescription drugs and devices may be returned, exchanged, or resold only if, in the professional judgment of the pharmacist, the integrity of the prescription drug has not in any way been compromised.
- **Controlled substances.** Under no circumstances shall pharmacy personnel accept from a patient or a patient's agent any controlled substances for return, exchange, or resale except to the same patient.
- **Personal contact items.** Pharmacy personnel shall not accept for reuse or resale any items of personal contact nature that have been removed from the original package or container after sale.

CLINICIAN SELF TREATMENT

Consistent with the UIHC Policy 1.21 ([http://policies.uihc.uiowa.edu/Governing Body Directives/Section/1.21ClinicianSelfTreatment.pdf](http://policies.uihc.uiowa.edu/Governing%20Body%20Directives/Section%201.21ClinicianSelfTreatment.pdf)), medications should not be ordered or prescribed by a clinician for himself or herself. Although self-treatment may be appropriate in an emergency setting where no qualified clinician is available, it is not anticipated that such a situation would arise within the UIHC. Another authorized prescriber (within a valid DEA registration number for controlled substances) should write the prescription for the practitioner or members of his/her immediate family, and this should be properly documented in the appropriate medical record.

PRESCRIPTIONS FOR HOUSE STAFF

The UIHC medical care program permits house staff physicians and dentists to a maximum of a 30-day supply of medications as deemed appropriate based upon the package insert, if medically necessary, for themselves and members of their immediate family (defined as a spouse or child living with the house staff member) at no cost. A clinician may not prescribe for himself/herself in accordance with Hospital Policy 1.21. Only medications on formulary may be prescribed. All prescriptions must be in writing, except in cases of an emergency. Certain high-cost medications within specific therapeutic classes may be restricted, requiring a clinical faculty signature. Failure to acquire any required signatures for these agents will result in the house staff member being billed the acquisition cost of the high-cost medication. All prescriptions must reflect the name of the patient for whom the medication is being prescribed. Prescriptions will be monitored for appropriateness.

To minimize waiting time for clinic and discharge patients, house staff are asked to plan ahead so that refills and new prescriptions for nonurgent medications are **presented one day and picked up the following day**. This will allow Pharmacy staff to fill house staff prescriptions at less busy times.

STORAGE OF PRESCRIPTION BLANKS

To reduce the incidence of theft of UIHC prescription blanks and to reduce illegal drug diversion, access to UIHC prescription blanks is limited. Prescription pads and single prescription blanks are stored only in secure centralized locations (e.g., medical conference rooms or medication preparation rooms) of the ambulatory care clinics and inpatient care units. Patients, visitors, and unauthorized hospital staff members should not have access to these locations. Prescription blanks must not be stored in patient examination rooms. Authorized prescribers may carry prescription blanks in their jacket/coat pockets.

In addition to controlled storage, prescription blanks are serialized, and dispersal of all prescription pads and storage destination is documented by Pharmacy staff. These procedures permit a trace of lost or stolen prescription blanks.

MEDICATION ORDERS WRITTEN BY PHYSICIAN ASSISTANTS AND ADVANCED REGISTERED NURSE PRACTITIONERS

Physician assistants and advanced registered nurse practitioners may write medication and treatment orders only when acting pursuant to policies or protocols approved by the Clinical Service Head and reviewed and approved by the Professional Practice Subcommittee. Copies of established protocols shall be provided to the Department of Pharmaceutical Care by the Clinical Service Heads or the Professional Practice Subcommittee.

Physician assistants and advanced registered nurse practitioners shall not have the authority to limit substitution or standardization pursuant to Pharmacy and Therapeutics Subcommittee protocols and shall not be authorized to override protocol or restricted drug indications.

For further information on prescribing discharge and outpatient medications, please see the on-line *Formulary and Handbook* — <http://www.healthcare.uiowa.edu/Pharmacy/Formulary/Form/17TakeHome.html>

Fungal Infections: Treatment Options and Adult Daily Doses

Currently several agents are available at UIHC for the treatment of systemic fungal infections – fluconazole, amphotericin B deoxycholate, amphotericin B lipid complex, itraconazole, voriconazole, and caspofungin among others. To aid in the choice of an antifungal agent, the chart “Fungal Infections: Treatment Options and Adult Daily Doses” was developed (See Table 2). The chart is only a guide, based on current recommendations, for treatment of fungal infections; doses and duration of therapy may vary depending on the patient’s immune status. In addition, because the treatment of fungal infections is often complicated, the Infectious Diseases Consult Service should be contacted for patient-specific recommendations. The chart is also available in the electronic Formulary at <http://www.formularyproductions.com/uihc/>.

When choosing an antifungal agent, cost should be considered; voriconazole, caspofungin, and amphotericin B lipid complex are substantially more expensive than generic fluconazole and amphotericin B deoxycholate. When appropriate, use of generic fluconazole or amphotericin B deoxycholate is encouraged due to the low cost of therapy. Table 1 lists the UIHC acquisition costs for agents used to treat systemic fungal infections. In addition, use of oral antifungal agents is preferred over intravenous products due to ease of administration, increased safety, and decreased cost.

Table 1. Inpatient Acquisition Costs for Antifungals

| Drug | Dosage Form | Dosing Range | Cost per 7 Days of Therapy |
|---|-------------|--|----------------------------|
| Amphotericin B deoxycholate | IV | 0.5 to 1 mg/Kg IV daily | |
| Fluconazole | IV, PO | Loading dose: 200 mg to 800 mg IV or PO Maintenance dose: 200 mg to 800 mg daily IV or PO | IV: PO: |
| Amphotericin B lipid complex (Abelcet®) | IV | 5 mg/Kg IV daily | |
| Caspofungin | IV | Loading dose: 70 mg IV Maintenance dose: 50 mg IV daily | |
| Itraconazole | PO | Loading dose: 200 mg PO TID for 4 days Maintenance dose: 200 mg PO BID | |
| Voriconazole | IV, PO | Loading dose: 6 mg/Kg IV q12h x 2 doses or 200 to 400 mg PO q12h x 2 doses Maintenance dose: 4 mg/Kg IV q12h or 100 to 200 mg PO q12h | IV: PO |

Table 2. Fungal Infections: Treatment Options and Adult Daily Doses*

| Indication | Fluconazole** | Amphotericin B | Itraconazole*** | Caspofungin | Voriconazole [§] |
|------------------------------------|---|--|--|------------------------------------|--|
| Aspergillosis | | | | | |
| | | <u>Ampho B deoxycholate</u> 1 to 1.25 mg/Kg/day for at least 10 weeks <u>Lipid-based Ampho B</u> 5 mg/Kg/day | 200 mg PO TID x 4 days followed by 200 mg PO BID | 70 mg IV load, then 50 mg IV daily | 6 mg/Kg IV q12h x 2 doses, followed by 4 mg/Kg IV q12h -OR- 400 mg PO q12h x 2 doses, followed by 200 mg PO q12h |
| Cryptococcosis | | | | | |
| | Load: 800 mg x 1, then 400 to 800 mg daily for 6 months | <u>Ampho B deoxycholate</u> 0.7 to 1 mg/Kg/day; treat for at least 12 weeks <u>Lipid-based Ampho B</u> 5 mg/Kg/day ^{††} | Itraconazole is the preferred oral agent for non-life threatening, non-CNS disease: 200 mg PO daily to BID for 6 to 12 months | | |
| Candidiasis | | | | | |
| Esophageal | 200 mg daily; consider 400 mg daily for the severely immunocompromised | | 100 to 200 mg PO daily for 3 weeks | 50 mg IV daily | |
| Oropharyngeal (Thrush)* | 100 to 200 mg daily | | 200 mg PO daily for 2 weeks | | |
| Symptomatic cystitis | 200 mg daily for 7 to 14 days | <u>Ampho B deoxycholate</u> 0.3 to 0.5 mg/Kg/day for 7 to 14 days -OR- 50 mg/L given by continuous bladder irrigation -OR- 1 dose of 0.3 mg/Kg given IV [‡] <u>Lipid-based Ampho B</u> 5 mg/Kg/day | | | |
| Systemic Candida Infection: | | | | | |
| <i>C. albicans</i> [^] | Preferred therapy Load: 800 mg x 1, then 400 mg to 800 mg daily [†] | <u>Ampho B deoxycholate</u> 0.5 to 1 mg/Kg/day <u>Lipid-based Ampho B</u> 5 mg/Kg/day | | 70 mg IV load, then 50 mg IV daily | |
| <i>C. glabrata</i> ^{^†} | Relatively resistant to fluconazole – use 800 mg daily | <u>Ampho B deoxycholate</u> 0.7 to 1 mg/Kg/day | | 70 mg IV load, then 50 mg IV daily | |
| <i>C. krusei</i> | | <u>Ampho B deoxycholate</u> 1 mg/Kg/day | | 70 mg IV load, then 50 mg IV daily | 6 mg/Kg IV q12h x 2 doses, followed by 3 mg/Kg IV q12h -OR- 400 mg PO q12h x 2 doses, followed by 200 mg PO q12h |
| Vaginal | 150 mg PO x 1 dose | | 200 mg PO BID x 2 doses | | |

(Over)

| Indication | Fluconazole** | Amphotericin B | Itraconazole*** | Caspofungin | Voriconazole§ |
|------------------------------------|---|--|--|-------------|---------------|
| Cryptococcosis | | | | | |
| Treatment | 400 mg daily for 6 to 10 weeks +/- flucytosine 37.5 mg/Kg QID, then suppression therapy | <u>Ampho B deoxycholate</u> 0.5 to 0.8 mg/Kg/day until response +/- flucytosine <u>Lipid-based Ampho B</u> 5 mg/Kg/day for 2 weeks +/- flucytosine 37.5 mg/Kg QID | | | |
| Suppression | 200 mg daily | | | | |
| Candididomycosis | | | | | |
| Treatment | | <u>Ampho B deoxycholate</u> 0.6 to 1 mg/Kg/day for 7 days; then 0.8 mg/Kg/day on alternate days <u>Lipid-based Ampho B</u> 5 mg/Kg/day | | | |
| Suppression | | If needed, use fluconazole for suppression therapy | | | |
| Histoplasmosis | | | | | |
| Pulmonary, localized, disseminated | | <u>Ampho B deoxycholate</u> 0.5 to 1 mg/Kg/day for 7 days, then 0.8 mg/Kg every other day to 10 to 15 mg/Kg total dose, then suppression therapy with itraconazole <u>Lipid-based Ampho B</u> 5 mg/Kg/day | Moderate: 200 mg PO daily x 9 months Life threatening: 200 mg PO TID x 3 days, then BID until response, then 200 mg daily for 9 months (itraconazole is not recommended for meningitis) | | |
| Suppression | | | 200 mg PO daily | | |

* Please consult Infectious Diseases for current and specific recommendations. Doses and duration may vary with immune status. Consult your clinical pharmacist for specific dosing in renal impairment and in the presence of potential drug-drug interactions. This list is not all-inclusive.

** Fluconazole can be given either IV or PO. The PO formulation is well-absorbed and over 90% bioavailable.

*** Capsules should be taken with a full meal to ensure maximal absorption. Solution should be taken without food, if possible. Absorption is best with the solution; therefore, the oral solution is the preferred method of oral administration. The absorption of itraconazole is decreased when administered with acid-suppressing medications. IV itraconazole is non-formulary.

§ Oral bioavailability of voriconazole is 96%. IV voriconazole should be avoided in patients with renal dysfunction (CrCl is less than 50 ml/min) due to accumulation of a toxic metabolite. In addition, IV voriconazole has been associated with visual disturbances.

¶ Reported efficacy with lipid-based amphotericin B in a limited number of case reports.

£ Not recommended, may only transiently clear funguria.

† Infectious Diseases Society of America (IDSA) recommends 800 mg in an unstable patient; once sensitivity data are available, use 400 mg for susceptible organisms, 800 mg for susceptible dose-dependant organisms, and another agent if resistant.

^ Therapy should be continued until 2 weeks after the last positive blood culture result and resolution of signs and symptoms of infection. Amphotericin B and caspofungin may be switched to fluconazole for completion of therapy. All indwelling central venous catheters should be removed, if possible.

‡ According to the IDSA guidelines (CID 2004;38:161-89), amphotericin B or caspofungin are the first line agents for treatment of candidemia due to *C. glabrata*; however, fluconazole is still an option in the less critically ill patient, or when antifungal susceptibility testing reveals the organism to be susceptible. Therapy should be continued until 2 weeks after the last positive blood culture result and resolution of signs and symptoms of infection. Amphotericin B and caspofungin may be switched to fluconazole for completion of therapy if the organism is fluconazole susceptible.

* May alternatively use nystatin 500,000 units swish & swallow TID to QID or clotrimazole troche 5x/day for uncomplicated oropharyngeal thrush.