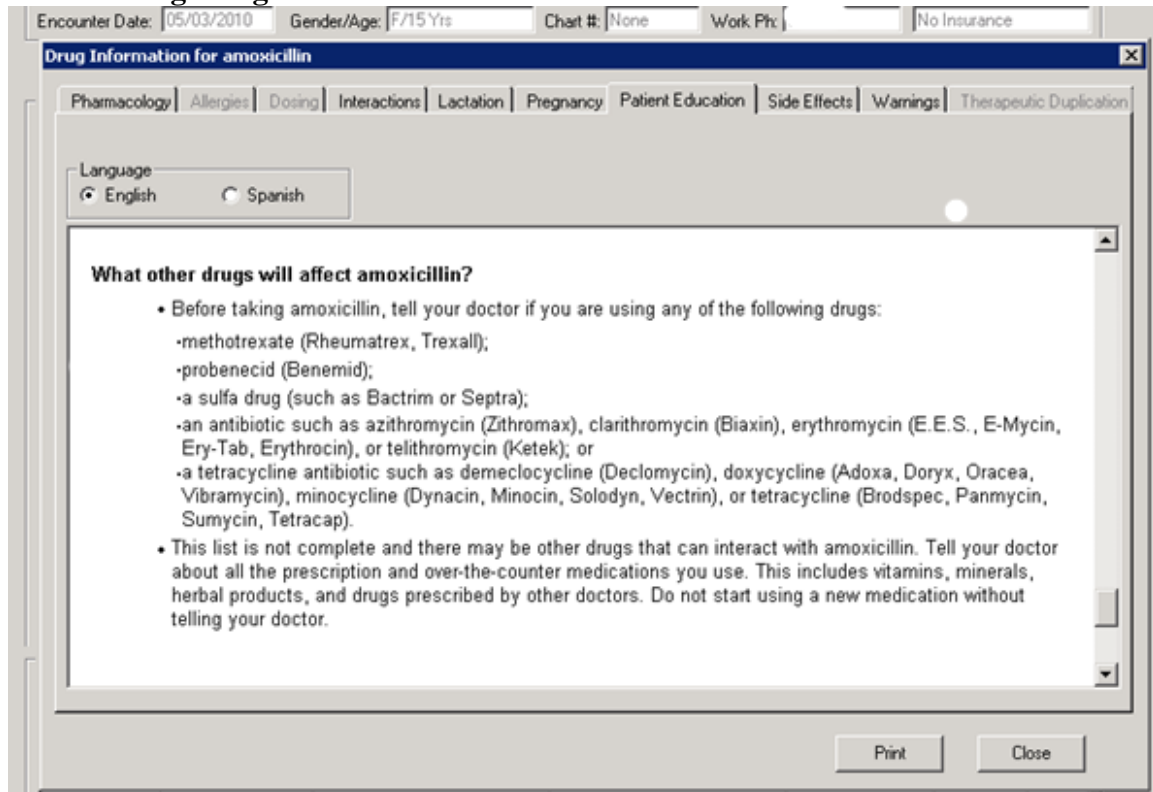


PPC 5: ELECTRONIC PRESCRIBING

Element B: Electronic Decision Support - Safety

EHS allows CHC-B' providers to write prescriptions using electronic prescription reference information at the point of care. CHC-B uses all 15 kinds of alerts and information and, therefore, scores 100% for using 8 or more of the listed alerts for PCMH. The following screen shots show examples of the references available within EHS.

Item 1: Drug-Drug Interaction General



The screenshot shows a software interface for drug information. At the top, there are fields for 'Encounter Date: 05/03/2010', 'Gender/Age: F/15 Yrs', 'Chart #: None', 'Work Ph:', and 'No Insurance'. Below this is a window titled 'Drug Information for amoxicillin'. The window has several tabs: 'Pharmacology', 'Allergies', 'Dosing', 'Interactions', 'Lactation', 'Pregnancy', 'Patient Education', 'Side Effects', 'Warnings', and 'Therapeutic Duplication'. The 'Interactions' tab is selected. Below the tabs, there is a 'Language' section with radio buttons for 'English' (selected) and 'Spanish'. The main content area is titled 'What other drugs will affect amoxicillin?' and contains the following text:

- Before taking amoxicillin, tell your doctor if you are using any of the following drugs:
 - methotrexate (Rheumatrex, Trexall);
 - probenecid (Benemid);
 - a sulfa drug (such as Bactrim or Septra);
 - an antibiotic such as azithromycin (Zithromax), clarithromycin (Biaxin), erythromycin (E.E.S., E-Mycin, Ery-Tab, Erythrocin), or telithromycin (Ketek); or
 - a tetracycline antibiotic such as demeclocycline (Declomycin), doxycycline (Adoxa, Doryx, Oracea, Vibramycin), minocycline (Dynacin, Minocin, Solodyn, Vectrin), or tetracycline (Brodspec, Panmycin, Sumycin, Tetracap).
- This list is not complete and there may be other drugs that can interact with amoxicillin. Tell your doctor about all the prescription and over-the-counter medications you use. This includes vitamins, minerals, herbal products, and drugs prescribed by other doctors. Do not start using a new medication without telling your doctor.

At the bottom right of the window, there are 'Print' and 'Close' buttons.

Item 2: Drug-Drug Interaction Specific

Drug Interaction for carvedilol

DRUG INTERACTIONS:

carvedilol - albuterol [Severity Major]

GENERALLY AVOID: Beta blockers may antagonize the effects of bronchodilator beta-adrenergic agonists, which may result in life-threatening bronchospasm. The mechanism is increased airway resistance and inhibition of beta-agonist-induced bronchodilation due to beta-2-adrenergic blockade. Ophthalmically applied beta blockers undergo some systemic absorption and may also interact. Propranolol has been used in the treatment of albuterol overdose.

MANAGEMENT: This combination should generally be avoided. If no alternative exists, small doses of a B-1 selective beta-blocker (e.g., acebutolol, atenolol, betaxolol, bisoprolol, or metoprolol) may be preferable; however, extreme caution is advised and patients' respiratory status should be closely monitored. Non-selective beta-blockers are generally considered contraindicated in patients with obstructive airways disease.

Accept Medication Decline Medication





Item 3: Drug-Disease Interaction General

Drug Information for ethinyl estradiol-norgestimate

Pharmacology | Allergies | Dosing | Interactions | Lactation | Pregnancy | Patient Education | Side Effects | Warnings | Therapeutic Duplication

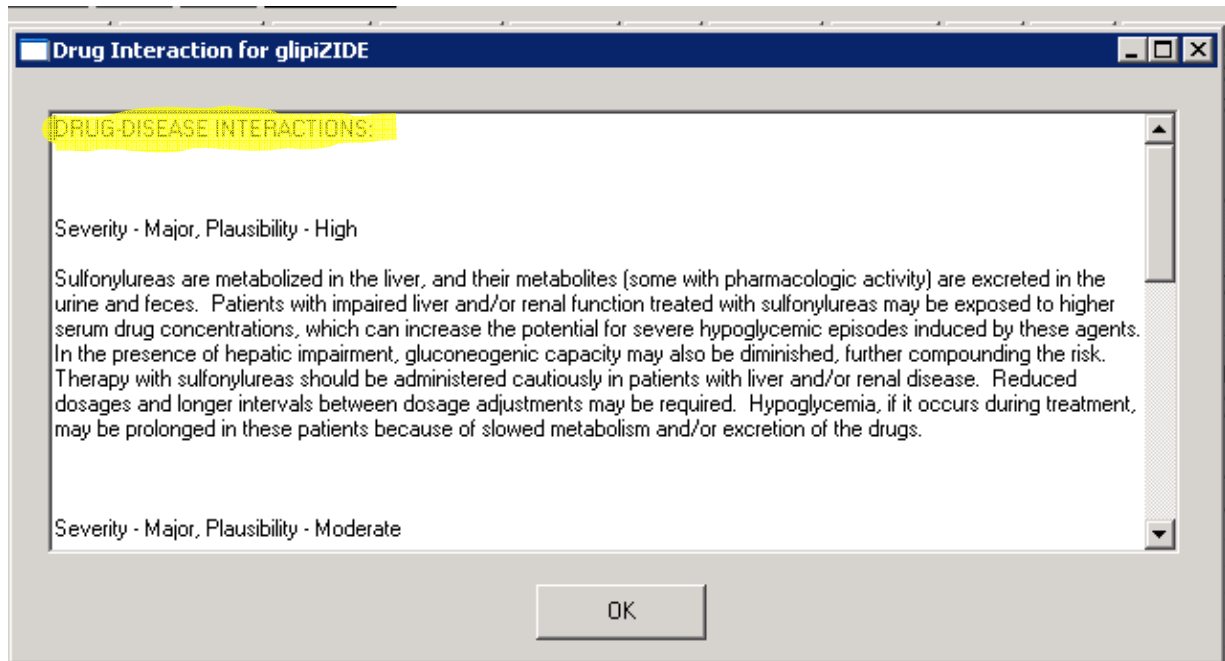
Language
 English Spanish

What is the most important information I should know about ethinyl estradiol and norgestimate?

-  Do not use this medication if you are pregnant or if you have recently had a baby.
-  Do not use this medication if you have any of the following conditions: a history of stroke or blood clot, circulation problems, a hormone-related cancer such as breast or uterine cancer, abnormal vaginal bleeding, liver disease or liver cancer, migraine headaches, or a history of jaundice caused by birth control pills.
-  You may need to use back-up birth control, such as condoms or a spermicide, when you first start using this medication. Follow your doctor's instructions.
-  Taking hormones can increase your risk of blood clots, stroke, or heart attack, especially if you smoke and are older than 35.
- Some drugs can make birth control pills less effective, which may result in pregnancy. Tell your doctor about all the prescription and over-the-counter medications you use, including vitamins, minerals and herbal products. Do not start using a new medication without telling your doctor.

Print Close

Item 4: Drug-Disease Interaction Specific



Drug Interaction for glipiZIDE

DRUG-DISEASE INTERACTIONS:

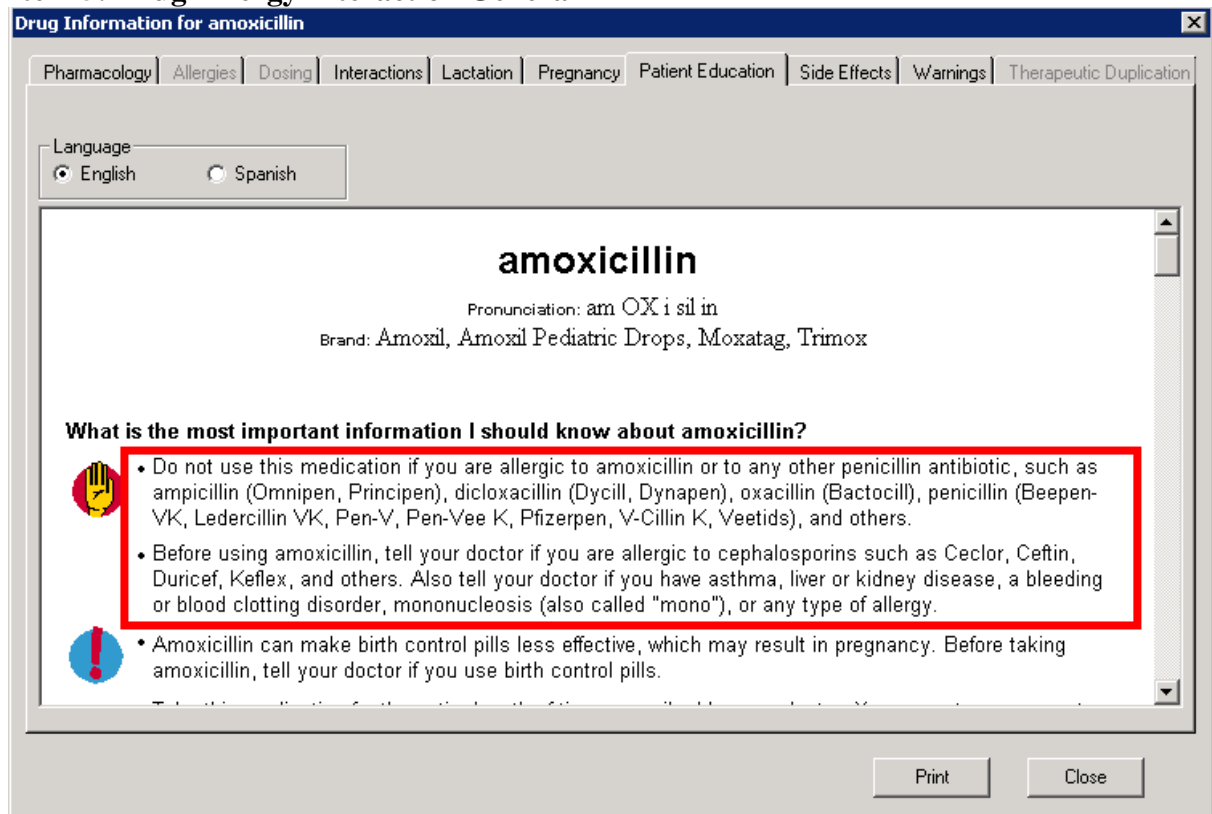
Severity - Major, Plausibility - High

Sulfonylureas are metabolized in the liver, and their metabolites (some with pharmacologic activity) are excreted in the urine and feces. Patients with impaired liver and/or renal function treated with sulfonylureas may be exposed to higher serum drug concentrations, which can increase the potential for severe hypoglycemic episodes induced by these agents. In the presence of hepatic impairment, gluconeogenic capacity may also be diminished, further compounding the risk. Therapy with sulfonylureas should be administered cautiously in patients with liver and/or renal disease. Reduced dosages and longer intervals between dosage adjustments may be required. Hypoglycemia, if it occurs during treatment, may be prolonged in these patients because of slowed metabolism and/or excretion of the drugs.

Severity - Major, Plausibility - Moderate

OK

Item 5: Drug-Allergy Interaction General



Drug Information for amoxicillin

Pharmacology | Allergies | Dosing | Interactions | Lactation | Pregnancy | Patient Education | Side Effects | Warnings | Therapeutic Duplication

Language
 English Spanish

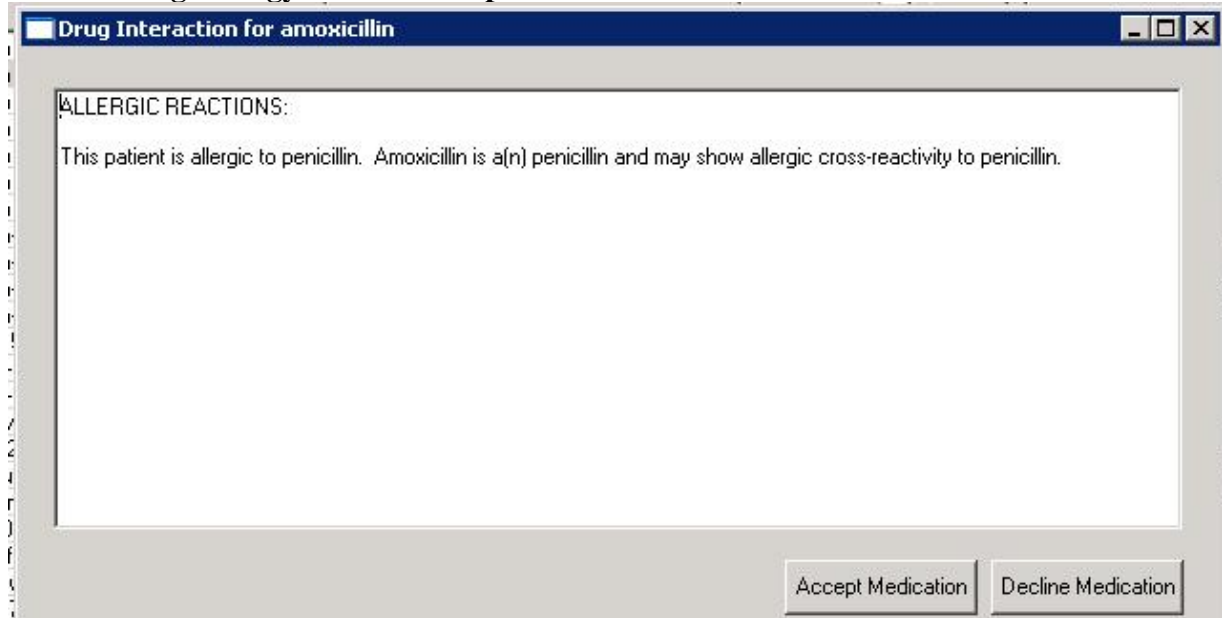
amoxicillin
Pronunciation: am OX i sil in
Brand: Amoxil, Amoxil Pediatric Drops, Moxatag, Trimox

What is the most important information I should know about amoxicillin?

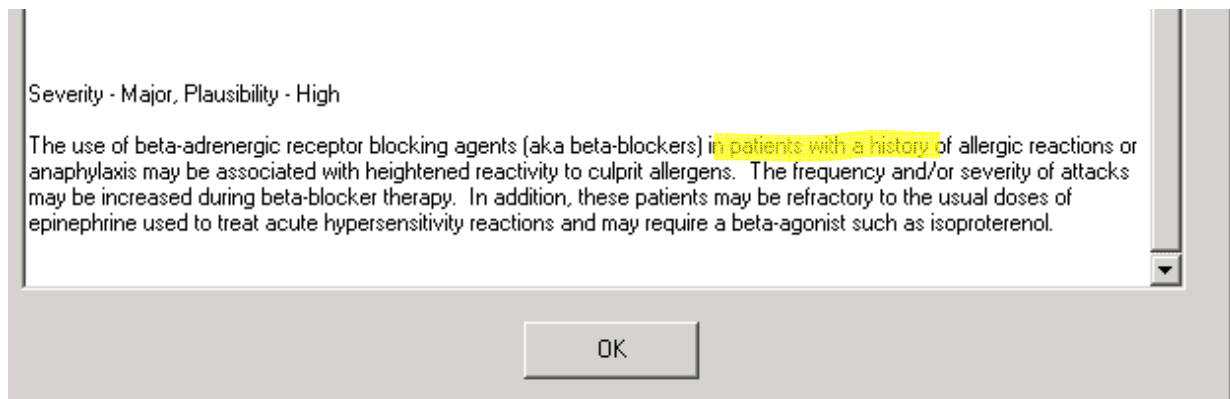
- Do not use this medication if you are allergic to amoxicillin or to any other penicillin antibiotic, such as ampicillin (Omnipen, Principen), dicloxacillin (Dycill, Dynapen), oxacillin (Bactocill), penicillin (Beeepen-VK, Ledericillin VK, Pen-V, Pen-Vee K, Pfizerpen, V-Cillin K, Veetids), and others.
- Before using amoxicillin, tell your doctor if you are allergic to cephalosporins such as Ceclor, Cefin, Duricef, Keflex, and others. Also tell your doctor if you have asthma, liver or kidney disease, a bleeding or blood clotting disorder, mononucleosis (also called "mono"), or any type of allergy.
- Amoxicillin can make birth control pills less effective, which may result in pregnancy. Before taking amoxicillin, tell your doctor if you use birth control pills.

Print Close

Item 6: Drug-Allergy Interaction Specific



Item 7: Drug-Patient History



Item 8: Appropriate dosing based on general information

Pediatric Dosing Calculator for amoxicillin Age: 15 Yrs

Pediatric Dosing Suggestions:

OTITIS MEDIA:
 4 weeks to 3 months: 20 to 30 mg/kg/day in divided doses every 12 hours
 4 months to 12 years: 20 to 50 mg/kg/day in divided doses every 8 to 12 hours; acute otitis media due to highly resistant strains of Streptococcus pneumonia may require doses of 80 to 90 mg/kg/day orally divided into 2 equal doses 12 hours apart

SKIN OR SOFT TISSUE INFECTION:
 4 weeks to 3 months: 20 to 30 mg/kg/day in divided doses every 12 hours
 4 months to 12 years: 20 to 50 mg/kg/day in divided doses every 8 to 12 hours; acute otitis media due to highly resistant strains of Streptococcus pneumonia may require doses of 80 to 90 mg/kg/day orally divided into 2 equal doses 12 hours apart

URINARY TRACT INFECTION:
 4 weeks to 3 months: 20 to 30 mg/kg/day in divided doses every 12 hours
 4 months to 12 years: 20 to 50 mg/kg/day in divided doses every 8 to 12 hours; acute otitis media due to highly resistant strains of Streptococcus pneumonia may require doses of 80 to 90 mg/kg/day orally divided into 2 equal doses 12 hours apart

PNEUMONIA:

Item 9: Appropriate dosing calculated for the patient

Pediatric Dosing Calculator for amoxicillin Age: 7 Yrs, 1 Mos

Pediatric Dosing Suggestions:

BACTERIAL ENDOCARDITIS PROPHYLAXIS:
 50 mg/kg orally as a single dose 1 hour prior to procedure
 Amoxicillin is not appropriate as endocarditis prophylaxis for patients identified as high-risk, including those with prosthetic heart valves, prior endocarditis, and those who have had surgically constructed systemic shunts or conduits. These patients should receive appropriate parenteral antimicrobial therapy.

ANTHRAX PROPHYLAXIS:
 80 mg/kg/day divided into equal doses administered orally every 8 hours
 Maximum dose: 500 mg/dose
 Oral amoxicillin is not considered first-line treatment for anthrax prophylaxis; it may, however, be used to complete a 60-day prophylactic course after 10 to 14 days of ciprofloxacin or doxycycline in pediatric patients. The total duration of antimicrobial therapy is 60 days.

CUTANEOUS BACILLUS ANTHRACIS:
 Treatment for confirmed cases of cutaneous Bacillus anthracis infection: 80 mg/kg/day divided into equal doses administered orally every 8

mg/kg/day

x Weight: kg

Frequency: 3 times a day x Every 8 hours/24

Display On SIG Amount mg

25 mg/ml

Display on SIG Quantity ml

7 8 9
4 5 6
1 2 3
0 . C

OK
Cancel

Item 10: Therapeutic Monitoring (Drug-Lab Alert)

Drug Information for warfarin

Pharmacology | Allergies | Dosing | Interactions | Lactation | Pregnancy | Patient Education | Side Effects | **Warnings** | Therapeutic Duplication

The most serious risks associated with warfarin are hemorrhage in any organ or tissue and, less frequently (less than 0.1%), necrosis and/or gangrene of skin and other tissues. Necrosis and hemorrhage have in some cases been reported to result in death or permanent disability. Necrosis usually appears within a few days of the start of anticoagulant therapy and appears to be associated with local thrombosis. Treatment through debridement or amputation of the affected tissue, limb, breast or penis has been reported in severe cases of necrosis. Careful diagnosis is needed to determine whether necrosis is caused by an underlying disease. Warfarin therapy should be discontinued when it is suspected to be the cause of developing necrosis and heparin therapy may be considered for anticoagulation. No treatment for necrosis has been considered uniformly effective, although various treatments have been attempted. These and other risk factors associated with anticoagulant therapy must be weighed against the risk of thrombosis or embolization in untreated patients.

It cannot be emphasized too strongly that anticoagulation treatment of each patient is a highly individualized matter. Warfarin, a narrow therapeutic range (index) drug, may be affected by factors such as other drugs and dietary vitamin K. Dosage should be maintained by periodic determinations of prothrombin time (PT)/International Normalized Ratio (INR) or other suitable coagulation tests. Determinations of whole blood clotting and bleeding times are not effective measures for control of anticoagulation therapy. Heparin prolongs the one-stage PT.

Caution should be used when warfarin is administered in any situation where added risk of hemorrhage, necrosis, and/or gangrene is present.

The risk of bleeding may be increased in hemodialysis patients receiving warfarin treatment. The benefit of therapy should be fully assessed prior to treating such patients with warfarin.

Item 11: Duplication of a drug in a therapeutic class – General

PBM Medication History | Medication History | Vitals | Options

Current Medication Summary

Add | Current | Print | ERx | Interactions | Medications Reconciled

Delete | Renew | Discontinue | Details | **Drug Info** | Sign Off | Edit | Edit Log | Req Hx | Map | WOR | Pharmacy

Prescribed	Medication N...	Sig	R...	Prescriber	Expiration	Pharmacy	Pharmacov P...	Ren...	Ma
10/27/2010	Lant 100 u...	SIG: 20 units subcuta...	11	C	10/21/2011	V		*	
10/27/2010	NovoLog Flex...	SIG: subcutaneously ...	11	C	10/21/2011	V		*	
09/27/2010	Coumadin 5 ...	SIG: orally once a da...	10	C	N/A	S		*	

Drug Information for warfarin

Pharmacology | Allergies | Dosing | Interactions | Lactation | Pregnancy | Patient Education | Side Effects | **Warnings** | Therapeutic Duplication

active order(s) for warfarin exist and may represent therapeutic duplication.

Item 12: Duplication of a drug in a therapeutic class – Specific

Drug Interaction for albuterol

THERAPEUTIC DUPLICATION:

active order(s) for albuterol exist and may represent therapeutic duplication.

Accept Medication Decline Medication

Item 13: Drugs to be avoided in the elderly – General

Drug Information for cyclobenzaprine

Pharmacology Allergies Dosing Interactions Lactation Pregnancy Patient Education Side Effects **Warnings** Therapeutic Duplication

The manufacturer reports that cyclobenzaprine is contraindicated for use in patients in the acute recovery phase of myocardial infarction. The manufacturer also reports that cyclobenzaprine is contraindicated for use in patients with arrhythmias, heart block, conduction disturbances, congestive heart failure or hyperthyroidism.

Current use of monoamine oxidase inhibitors or use of monoamine oxidase inhibitors within the previous 14 days is a contraindication to the use of cyclobenzaprine.

Cyclobenzaprine (like tricyclic antidepressants) should not be discontinued abruptly in patients who have received the medication for long periods or at high doses. Abrupt discontinuation may theoretically result in symptoms of withdrawal.

Because most muscle relaxants and antispasmodic drugs can cause anticholinergic adverse events, sedation, and weakness, and because their effectiveness at doses tolerated by elderly people is questionable, cyclobenzaprine meets the Beers criteria as a medication that is potentially inappropriate for use in older adults.

Cyclobenzaprine may impair the mental abilities necessary for potentially hazardous tasks such as driving or operating machinery.

Patients should be warned that the CNS depressant effects of cyclobenzaprine may be increased by the concurrent use of other CNS depressants, including alcohol.

Item 14: Drugs to be avoided in the elderly – Specific

The screenshot shows a medical software interface with a patient record at the top. The date is 11/02/2010, and the patient's age is 75. Below this, there are buttons for 'PBM Medication History', 'Medication History', 'Vitals', and 'Opt'. A 'Medication Summary' section includes buttons for 'Current', 'Print', 'ERx', and 'Interactions'. A checkbox for 'Medications Reconciled' is checked, and a note says 'No Known Current Meds'. A pop-up window titled 'Drug Interaction for meloxicam' is open, displaying a warning: 'Severity - Major, Plausibility - High'. The text explains that NSAIDs can cause GI toxicity and that elderly patients are more susceptible to these effects.

Date: 11/02/2010 Gender/Age: 75 Chart #: LC Work Ph: No Insurance

PBM Medication History Medication History Vitals Opt

Medication Summary

Current Print ERx Interactions

Medications Reconciled

No Known Current Meds

Drug Interaction for meloxicam

Severity - Major, Plausibility - High

Nonsteroidal anti-inflammatory drugs (NSAIDs) can cause gastrointestinal mucosal damage, the risk of which appears to be related to both dosage and duration of therapy. Serious GI toxicity such as bleeding, ulceration and perforation can develop at any time, with or without warning symptoms, and occurs in approximately 1% of patients treated for 3 to 6 months and 2% to 4% of patients treated for one year. These trends continue with longer duration of use, although short-term therapy is not without risk. While agents that selectively inhibit cyclooxygenase-2 (i.e., COX-2 inhibitors) are generally thought to be associated with a reduced risk of GI toxicity compared to conventional NSAIDs, they have not been proven risk-free. In addition, there is evidence that COX-2 inhibitors may delay healing of gastric ulcers, and likely to the same extent as traditional NSAIDs. Thus, therapy with all NSAIDs, including COX-2 inhibitors, should be prescribed cautiously in patients with a history of peptic ulcer disease and/or gastrointestinal bleeding. Patients with such a history who use NSAIDs have a greater than 10-fold increased risk for developing a GI bleed compared to patients with neither of these risk factors. Caution is also advised if NSAIDs are prescribed to patients with other risk factors such as oral corticosteroid or anticoagulant use, alcohol use, smoking, older age, and poor general health status. Particular vigilance is necessary when treating elderly (i.e., age 60 years or more) and/or debilitated patients, since they are often more susceptible to the GI toxicity of these drugs and seem to tolerate ulceration and bleeding less well than

Item 15: Patient Appropriate Medication Information

The screenshot shows a 'Drug Information for albuterol' window. It has tabs for 'Pharmacology', 'Allergies', 'Dosing', 'Interactions', 'Lactation', 'Pregnancy', 'Patient Education', 'Side Effects', 'Warnings', and 'Therapeutic Duplication'. The 'Patient Education' tab is selected. Below the tabs is a language selector with 'English' selected and 'Spanish' unselected. The main content area displays the drug name 'albuterol', its pronunciation 'al BYOO teh rall', and brand names 'Proventil, Proventil Repetabs, Ventolin, Volmax'. It then provides two sections of patient education: 'What is the most important information I should know about albuterol?' and 'What is albuterol?'. The first section lists a warning about seeking medical attention if asthma symptoms worsen. The second section explains that albuterol works by relaxing muscles in the airways and is used to treat bronchospasm. At the bottom right, there are 'Print' and 'Close' buttons.

Drug Information for albuterol

Pharmacology Allergies Dosing Interactions Lactation Pregnancy Patient Education Side Effects Warnings Therapeutic Duplication

Language

English Spanish

albuterol

Pronunciation: al BYOO teh rall

Brand: Proventil, Proventil Repetabs, Ventolin, Volmax

What is the most important information I should know about albuterol?

- Seek medical attention if you notice that you require more than your usual or more than the maximum amount of any asthma medication in a 24-hour period. An increased need for medication could be an early sign of a serious asthma attack.

What is albuterol?

- Albuterol works by relaxing muscles in the airways to improve breathing.
- Albuterol is used to treat bronchospasm (wheezing, shortness of breath) associated with reversible

Print Close