



Rx Update

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Editors: Joan Murhammer, R.Ph., Mary Ross, R.Ph. MBA, Kevin Bebout, R.Ph.

MEDICATIONS THAT SHOULD NOT BE CRUSHED

If a liquid formulation of a medication is not available, it is sometimes desirable to crush a medication for a patient who is experiencing difficulty swallowing tablets/capsules or has a nasogastric tube placed. However, crushing the tablet/capsule may be an unsafe practice due to the formulation or properties of some medications. The following is a partial list of medications that should **not** be crushed before administration:

Enteric-coated tablets are designed to remain intact through the stomach and release the medication in the small intestine to prevent destruction of drug by stomach acids, prevent stomach irritation, or delay onset of action. When enteric-coated tablets are crushed, the drug is **released too early and may be destroyed by stomach acid or irritate the stomach lining**. These include: bisacodyl (Dulcolax[®]), budesonide (Entocort EC[®]), enteric-coated aspirin (Ecotrin[®]), lansoprazole (Prevacid[®]), omeprazole (Prilosec[®]), pancrelipase (Pancrease[®]), divalproex sodium (Depakote[®]), solifenacin (Vesicare[®]), and many erythromycin products.

Extended-release products are formulated to slowly release a medication over an extended period of time. They should not be crushed because it would cause the active ingredient to be **delivered all at once and it may potentially deliver a toxic dose of medication and cause an increased risk of adverse effects**. Many extended-release formulations have abbreviations affixed to their name (e.g., CR, ER, LA, SR, XL, XR) to identify them as extended-release. These include: diltiazem controlled-dissolution (Cardizem CD[®]), fexofenadine/pseudoephedrine (Allegra-D[®]), mesalamine (Asacol[®], Pentasa[®]), verapamil sustained-release (Calan SR[®], Isoptin SR[®]), oxybutynin extended-release (Ditropan XL[®]), propranolol long-acting (Inderal LA[®]), tamsulosin (Flomax[®]), divalproex sodium extended-release (Depakote ER[®]), and many theophylline products.

Some medications have a very **bitter taste** and are coated to help mask the taste of the active ingredient. If these medications are crushed, the **taste of the medication may be unacceptable to patients** if taken orally, but not if administered through a feeding tube. These include: cefuroxime (Ceftin[®]), ciprofloxacin (Cipro[®]), docusate (Colace[®]), ibuprofen (Motrin[®]), praziquantel (Biltricide[®]), indinavir (Crixivan[®]), raloxifene (Evista[®]), topiramate (Topamax[®]), and imatinib (Gleevec[®]).

Medications that are **irritants** can cause **esophageal or stomach irritation or ulceration** if crushed or opened. They can also cause irritation if the product is aerosolized and the powder is inhaled, or comes in contact with eyes or skin. These include: alendronate (Fosamax[®]), atomoxetine (Strattera[®]), diflunisal (Dolobid[®]), ganciclovir (Cytovene[®]), ibandronate (Boniva[®]), isotretinoin (Accutane[®]), piroxicam (Feldene[®]), risedronate (Actonel[®]), valganciclovir (Valcyte[®]), and valproic acid (Depakene[®]).

Crushing products with **carcinogenic or teratogenic** potential **may expose healthcare workers to health risks** through aerosolization of the product. These include: dasatinib (Sprycel[®]), finasteride (Proscar[®]), mycophenolate (CellCept[®]), temozolomide (Temodar[®]), and cancer chemotherapy agents.

Benzonatate (Tessalon Perles[®]) can **anesthetize local mucosa** and cause a loss of the gag reflex.

Oral disintegrating tablets are very **fragile** and should only be directly placed on the tongue. These include: mirtazapine (Remeron SolTab[®]), and olanzapine (Zyprexa Zydis[®]).

Some medications can directly cause **staining of the teeth** because of the ingredients or dyes in the product and should be swallowed whole. These include: amoxicillin/clavulanate (Augmentin[®]), linezolid (Zyvox[®]), and iron products.

A list of medications that should not be crushed can be found at: <http://www.ismp.org/Tools/DoNotCrush.pdf>. If you have any questions regarding the acceptability of crushing a medication or to see if there is a liquid formulation of a medication is available, please contact the Pharmacy serving your area or the Drug Information Center (6-2600).