

WHAT HAPPENS WHEN MEDICATIONS ARE CRUSHED: SOME EXAMPLES

Generic name (some brand names)	Category	Generic name (some brand names)	Category
Analgesics			
Morphine sulphate (MS Contin)	1		
Oxycodone (OxyContin)	1		
Paracetamol (Duatrol SR, Panadol Extend, Panadol Osteo)	1		
Tramadol (Tramahexal SR, Tramal SR, Zydol SR)	1		
Antibiotics			
Cefaclor (Ceclor CD, Keflor CD)	1		
Amoxicillin and clavulanic acid (Augmentin Duo, Clamoxyl Duo)	1, 2		
Doxycycline (Doryx, Doxsig, Doxy-50, Doxy-100, Doxyhexal, Doxylin, Vibramycin, Vibra-Tabs 50)	3		
Erythromycin (EES, Eryc)	1		
Nitrofurantoin (Macrochantin)	3		
Antidepressants			
Venlafaxine (Efexor XR)	1		
Antiepileptics			
Carbamazepine (Tegretol CR)	1		
Antihistamines			
Dexchlorpheniramine (Polaramine Repetabs),	1		
Dexchlorpheniramine/pseudoephedrine (Demazin Day/Night relief, sustained-release tablets, etc)	1		
Fexofenadine/pseudoephedrine (Telfast Decongestant)	1		
Loratadine/pseudoephedrine (Clarinase 24 hour relief, repetabs)	1		
Pheniramine (Avil Retard)	1		
Antineoplastic and Immunomodulating agents			
Altretamine (Hexalen), azathioprine (Imuran), busulphan (Myleran), capecitabine (Xeloda), chlorambucil (Leukeran) cyclophosphamide (Cycloblastin), cyclosporin (Neoral), levamisole (Ergamisol), etoposide (Vepesid), hydroxyurea (Hydrea), idarubicin (Zavedos), melphalan (Alkeran), mercaptopurine (Purinethol), methotrexate (Ledertrexate, Methoblastin), temozolomide (Temodal) and others	6		
Anti-Parkinson's disease			
Levodopa controlled release (Sinemet CR, Madopar HBS)	1		
Cardiovascular medications			
Candesartan /hydrochlorothiazide (Atacand Plus)	1		
Isosorbide mononitrate (Imdur, Durice, Imtrate, Monodur)	1		
Indapamide 1.5mg (Dapa-Tabs, Natrilix SR)	1		
Felodipine (Felodur SR, Plendil ER)	1		
Nifedipine (Adalat, Adalat Oros, Adefin, Adefin XR, Nifecard, Nifhexal, Nyefax)	2		
Nimodipine (Nimotop)	2		
Verapamil (Anpec SR, Cordilox SR, Isoptin SR, Veracaps SR)	1		
Quinidine (Kinidin Durules)	1		
Aspirin enteric coated (Astrix 100 capsules, Cartia)	1		
Glycerol trinitrate sub lingual (Anginine)	1		
Dipyridamole SR (Asasantin SR, Persantin SR)	1		
Electrolyte			
Sustained release potassium chloride (Duro-K, Slow-K, Span-K)	3		
Endocrinology			
Alendronate (Fosamax), Risedronate (Actonel)	3		
Gastrointestinal			
Docusate (Coloxyl), Docusate & senna Coloxyl & senna [frequently crushed if acceptable to patient]	6		
Olsalazine (Dipentum), mesalazine (Mesasal, Salofalk), sulfasalazine (Salazopyrin)	4		
Omeprazole (Losec, Acimax), lansoprazole (Zoton), pantoprazole (Somac) [Some brands may be dispersed in water prior to administration]	2		
Iron products			
Iron-containing products (Ferrogradumet, Fergon, FGF, Fefol)	3		
Non-steroidal anti-inflammatory agents (NSAIDs)			
Ketoprofen Sustained release (Orudis SR, Oruvail SR)	1		
Naproxen Sustained release (Naprosyn SR, Proxen SR)	3		
Diclofenac enteric coated (diclofenac and misoprostol— Arthrotec, Clonac, Diclohexal, Dinac, Fenac, Voltaren)	3		
Other NSAIDs may cause an irritant effect	3		
Pancreatic supplements			
Pancrease, Cotazym, Creon	4		
Psychoactive medications			
Chlorpromazine (Largactil)	5		
Respiratory			
Theophylline controlled release (Nuelin SR, Theodur)	1		
Miscellaneous			
Isotretinoin (Roaccutane)	3,5		
Methylphenidate (Concerta)	1		
Phenytoin (Dilantin)	1		
Pseudoephedrine SR (Sudafed 12 hour relief)	6		
Quinine sulphate (Quinate, Quinoctal, Quinsul)	6		
Quinine bisulphate (Biquinate, Myoquin, Quinbisul)	6		
Legend			
		1. Altered absorption characteristics	
		2. Medication instability	
		3. Local irritant effect	
		4. Failure to reach site of action	
		5. Occupation health and safety	
		6. Unacceptable/undisguisable taste	
Note: List of brands and medications is not exhaustive. Some tablets may be cut in half but not crushed. Check with product information before recommending crushing, cutting or dispersing.			

A CRUSHING PROBLEM

DR JENNY GOWAN CRUNCHES THE FACTS ON SWALLOWING MEDICATIONS

SWALLOWING POSES A CHALLENGE for medication administration. When patients cannot swallow tablets whole, they or their carers often crush them.

In Aged Care Homes, particularly in high care facilities, crushing is common. There are protocols in place, but it still causes concern. Legally, crushing or opening medication results in unlicensed administration: liability lies solely with the nurse if the action was unauthorised and is shared with the prescriber and pharmacist offering advice if it has been authorised.

Doctors and pharmacists are often unaware of this increasingly common practice.

Altering the solid dosage forms by crushing tablets or opening capsules may result in reduced effectiveness, a greater risk of toxicity, or in an unacceptable taste or texture.

In Aged Care Homes a list of medications which must not be crushed or chewed is usually provided by the pharmacist. The table opposite gives some examples

Controlled-release medications

Many medications are formulated to release drug in a controlled manner over a defined dosing period, usually 12 or 24 hours. Crushing these medications may result in an unintended large bolus dose. Medications labelled as “controlled release” (CR), “sustained release” (SR), “modified release” (MR) “controlled delivery” (CD), “enteric coated” (EC) are slow-release formulations. They cannot be crushed, although some can be halved. Capsules containing medication in small pellets, with the release properties are built into each pellet, can be opened but not crushed.

Some swallowing solutions

It is important to ask all patients whether they are having swallowing difficulties.

Using another brand, or changing from a tablet to a capsule, liquid or dispersible formulation, may help. Speech therapists can also provide valuable assistance with swallowing techniques.

Equipment for crushing tablets should:

- Permit complete recovery of powdered material
- Be washed and dried after use for each person



Dr Jenny Gowan at the Division, training pharmacists in medication review procedures

- For cytotoxic medication, there should be a dedicated set of equipment for each resident.

Equipment (such as a mortar and pestle) should be cleaned with a damp cloth, followed by a dry cloth, after use for each resident. Plastic screw-type crushers should be avoided.

Finally . . .

If you are giving tablets and capsules together, crush the tablets first, then open the capsule and add its powder or pellets, to prevent crushing sustained release or enteric-coated pellets.

Make sure the crushed tablets or capsule contents are taken as soon as possible, to reduce degradation and minimise any risk.

Mixing with a small amount of acceptable food such as jam or fruit puree can mask an unpleasant taste and increase compliance.

As crushing carcinogenic or teratogenic products may be a hazard to the carer because of aerosolisation of particles, consider using antibiotic mixtures.

Email jenny.gowan@ndgp.org.au for a copy of her paper on this topic, including references.

Medication reviews (HMRs and RMRs) can alert GPs and pharmacists to many problems. The review can also help solve the problem by looking at medication alternatives.

For all information on medication reviews, call the Division's Dr Jenny Gowan, 8480 4611.