Which medicines can I crush?

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V[XX] Effective: [06M09M2016 Review: [MM/YYYY]
Learning outcomes

• Recognise why some medications can be crushed while others can’t
• Explain how to determine a safe way to administer medications to a patient who can’t swallow their medications whole
• Distinguish what safeguards are available to ensure safety
• Identify further resources
Background

• Recent observational study compared safe medication modification before and after nurse education

• Education improved the proportion of medicines prepared safely from 45% to 91%

• Medicines that were prepared safely were considered safe if prepared according to one of the suggested methods in the Don’t Rush to Crush book.

• In the past, product information, nursing staff, pharmacist and treating team agreed on a plan

• More recently
  – Don’t Rush to Crush Handbook was developed to provide a consistent way to modify medicines.
Why is this important

Why do we need to think before we modify medicines?

1. Occupational health and safety implications
2. Medical reasons
3. Legal reasons
1. Occupational health and safety implications

Altering a dose form may introduce increased hazard to patients and the staff

For example

Methotrexate
   can cause risk to both patient and staff because it is cytotoxic

Doxycycline
   can cause oesophageal/gastric irritation for the patient if crushed

Altering a dose form may introduce increased hazards to those handling and altering the medicine, including the person giving the medicine and to others in the same area as there is potential for exposure to fine particles released into the air or through skin contact.
2. Medical Reasons

Changing the form of a medicine may alter:
- Stability, effectiveness, increase risk of toxicity, or result in an unacceptable taste or texture.

Examples
- Pantoprazole
  - Is enteric coated meaning the drug is broken down by stomach acid. The enteric coating protects it until it gets to the small intestine where it is absorbed.
- Isosorbide Mononitrate
  - Is sustained release meaning the drug is released from the tablet slowly. If it is crushed all the medicine will be absorbed quickly.
3. Legal reasons

- “the right medicine is given to the right person at the right time using the right dose via the right route” – The 6 rights

- In general, dispersing/crushing a solid oral medicine and the administration of medicines via an enteral feeding tube is outside a product's licence/registration - ‘off-label use’

- Manufacturer will disclaim liability for any harm that may occur to the individual receiving, or person giving, the medicine
Patient requirements

Patients who might require medicines to be altered:

- Patients with swallowing difficulties
  - a physical inability to swallow foods or liquids
  - a psychological inability to swallow medicine
  - a refusal to take medicine due to a deteriorating cognitive state.

- Patients with enteral feeding tubes
So what can we do?

• Resources
  – Australian ‘Don’t Rush to Crush’ Handbook
  – MIMS (available to all staff on CKN)
  – Ward pharmacist
    o Please let the treating team and pharmacist know that the patient is having difficulty swallowing (if they don’t already know)
Simple Search

Found 16 result(s) in 0.019 seconds
Did you mean: Sevelamer hydrochloride Biperiden hydrochloride Amlodine hydrochloride Donepezil hydrochloride Dothiepin hydrochloride
 Didn't find what you want? Try Advanced Search

Cardizem CD Extended release capsules [Sanofi-Aventis]
Diltiazem hydrochloride
Use: Ca channel blocker. Hypertension; chronic stable angina where no evidence of vasospastic, unstable angina
Dose: May be taken with or without food. Individualise dosage; admin once daily. Hypertension, monotherapy. Initially: 180-240 mg/day; adjust dosage every 2 wks; usual maintenance: 240-360 mg/day; max 360 m...
MIMS Class: Antihypertensive agents Antiangina agents

Cardizem Tablets [Sanofi-Aventis]
Diltiazem hydrochloride
Use: Ca channel blocker. Mod to severe angina pectoris due to atherosclerotic coronary artery disease or coronary artery spasm
Dose: Initially 30 mg 4 times daily before meals and at bedtime. Incr gradually at 1-2 day intervals to optimum, usually 180-240 mg/day; max 360 mg/day. Elderly: may reduce dose
MIMS Class: Antiangina agents

Chemmart Diltiazem CD Extended release capsules [Apotex]
Diltiazem hydrochloride
MIMS Class: Antihypertensive agents

Chemmart Diltiazem Tablets [Apotex]
Diltiazem hydrochloride
Use: Ca channel blocker. Mod-severe angina pectoris due to atherosclerotic CAD, coronary artery spasm
Dose: Initially 30 mg 4 times daily before meals and at bedtime; incr gradually at 1-2 day intervals to optimum, usually 180-240 mg/day (in 3-4 divided doses); max 360 mg/day. Elderly: consider dose reduci...
MIMS Class: Antiangina agents

Coras Tablets [Alphapharm]
Diltiazem hydrochloride
Things to consider:

Before you start

- Document all alterations to medication
- Administer one medicine at a time
- Always use oral/enteral dispensers
- Always use cool or room-temperature water
- Always flush enteral feeding tubes after stopping the feed, between medicines and before restarting a feed
- Always consider medical, legal and occupational health and safety implications
- Dispensing is preferable to crushing especially for enteral feeding tubes

Figure 1. Oral dispensers
Practice point

- Each medicine should be prepared separately because chemical incompatibilities between drugs can occur.
- It is important to consider whether or not a medicine should be modified before doing so.
- Enteral tubes are essentially designed for the administration of liquid feeds and fluids and NOT the administration of solids.
- When patient can no longer take medications orally, the medication plan should be reviewed and any non-essential medications should be ceased.
- Alternate routes and alternatives forms of medication should be considered.
- The administering RN should seek support and advice from the Medical Officer and the Pharmacist to ensure safety in the administration of medication.
Review of the medication plan

- Consider the therapeutic rationale for each drug
- Discontinue those that are not essential or that are duplicated.
- Consider alternative routes depending on the patient profile and other forms of available medication preparations.
- Liquid preparations may be available (Example: syrup as opposed to tablets).
- Monitor the effects of changes in medication.
PREPARING MEDICINES FOR PEOPLE WITH SWALLOWING DIFFICULTIES

Always refer to individual monograph. Always prepare one medicine at a time

Method D: Dispersible tablet

1. Add tablet to mortar, medicine cup or oral/enteral dispenser
2. Mix with 5 to 10 mL water
3. Allow the tablet to disperse. This may take several minutes. Gentle shaking may be required
4. Give the solution immediately

If there is an aspiration risk, crush the tablet and mix with thickened water, or yoghurt (if appropriate). Consult a speech pathologist for appropriate thickness. See section 7.2 Aspiration risk

Method E: Crush tablet

1. Crush tablet with mortar and pestle or tablet crushing device
2. Mix powder with 5 to 10 mL water
3. Draw mixture into oral/enteral dispenser
4. Ensure that all of the medicine is removed from the mortar (an extra 10 mL of water may be used)
5. Shake well to mix
6. Give immediately

If there is an aspiration risk, crush the tablet and mix with thickened water, or yoghurt (if appropriate). Consult a speech pathologist for appropriate thickness. See section 7.2 Aspiration risk

Method F: Dispersible capsule contents

1. Open capsule and add contents to a mortar or oral/enteral dispenser
2. Disperse in 10 mL water
3. If required, draw mixture into oral/enteral dispenser. Ensure that all of the medicine is removed from the mortar (an extra 10 mL of water may be used)
4. Shake well to mix
5. Give immediately

If there is an aspiration risk, mix capsule contents with thickened water, or yoghurt (if appropriate). Consult a speech pathologist for appropriate thickness. See section 7.2 Aspiration risk
PREPARING MEDICINES FOR ADMINISTRATION VIA ENTERAL FEEDING TUBE

Always refer to individual monograph. Always prepare one medicine at a time.

Method A: Dispersible tablet
1. Stop enteral feed
2. Flush tube with 30 mL water
3. Allow break in feed if needed
4. Remove the plunger from an oral/enteral dispenser
5. Place the tablet into the oral/enteral dispenser and replace the plunger
6. Draw 5 to 10 mL of water into the oral/enteral dispenser
7. Allow the tablet to disperse. This may take several minutes. Gentle shaking may be required
8. Give the solution immediately via the feeding tube
9. Flush medicine through tube with 10 mL of water
10. Give remaining medicines according to monograph. Flush with at least 5 mL of water between each medicine
11. After final medicine, flush the tube with 30 mL water
12. Restart feed (when appropriate)

Method B: Crush tablet
1. Stop enteral feed
2. Flush tube with 30 mL water
3. Allow break in feed if needed
4. Crush tablet to a fine powder using a mortar and pestle or tablet-crushing device
5. Mix powder with 10 mL water
6. Draw mixture into oral/enteral dispenser
7. Ensure all the medicine is removed from the mortar (an extra 10 mL of water may be used to rinse)
8. Shake well to mix
9. Give the solution immediately via the feeding tube
10. Flush medicine through tube with 10 mL of water
11. Give remaining medicines according to monograph. Flush with at least 5 mL of water between each medicine
12. After final medicine, flush the tube with 30 mL water
13. Restart feed (when appropriate)

Method C: Dispersible capsule contents
1. Stop enteral feed
2. Flush tube with 30 mL water
3. Allow break in feed if needed
4. Open capsule and add contents to an oral/enteral dispenser or mortar
5. Disperse in 10 mL of water
6. If required, draw mixture into oral/enteral dispenser. Ensure that all of the medicine is removed from the mortar (an extra 10 mL of water may be used)
7. Shake well to mix
8. Give the solution immediately via the feeding tube
9. Flush medicine through tube with 10 mL of water
10. Give remaining medicines according to monograph. Flush with at least 5 mL of water between each medicine
11. After final medicine, flush the tube with 30 mL water
12. Restart feed (when appropriate)
How to modify medicines:

<table>
<thead>
<tr>
<th>Date</th>
<th>Medication (Print Generic Name)</th>
<th>Route</th>
<th>Dose</th>
<th>Frequency &amp; Enter times</th>
<th>Frequency &amp; Enter times</th>
</tr>
</thead>
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<tr>
<td>18/6</td>
<td><strong>Atenolol</strong></td>
<td><strong>PO</strong></td>
<td><strong>50mg</strong></td>
<td><strong>4am, 6pm</strong></td>
<td><strong>4am, 6pm</strong></td>
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<td></td>
<td>Hypertension</td>
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<td></td>
<td><strong>New</strong></td>
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<tr>
<td></td>
<td>Prescriber Signature</td>
<td>Print Your Name</td>
<td>Contact</td>
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<table>
<thead>
<tr>
<th>Date</th>
<th>Medication (Print Generic Name)</th>
<th>Route</th>
<th>Dose</th>
<th>Frequency &amp; Enter times</th>
<th>Frequency &amp; Enter times</th>
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</thead>
<tbody>
<tr>
<td>18/6</td>
<td><strong>Aspirin</strong></td>
<td><strong>PO</strong></td>
<td><strong>300mg</strong></td>
<td><strong>4am, 6pm</strong></td>
<td><strong>4am, 6pm</strong></td>
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<td>Prescriber Signature</td>
<td>Print Your Name</td>
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<th>Dose</th>
<th>Frequency &amp; Enter times</th>
<th>Frequency &amp; Enter times</th>
</tr>
</thead>
<tbody>
<tr>
<td>18/6</td>
<td><strong>Targin oxycodone/naloxone</strong></td>
<td><strong>PO</strong></td>
<td><strong>10/5mg</strong></td>
<td><strong>8am, 12pm</strong></td>
<td><strong>8am, 12pm</strong></td>
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<td></td>
<td>Pain</td>
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<td>Prescriber Signature</td>
<td>Print Your Name</td>
<td>Contact</td>
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</tbody>
</table>

Can be dispersed.
Can be crushed.
Swallow whole.
Example

• 84 year old male with Parkinson’s Disease
• Charted Madopar tablets (levodopa/benserazide) 100/25mg QID
• Patient is having difficulty swallowing some of his tablets.
• Can you crush Madopar?

• *It depends! There are multiple formulations of Madopar.*

• Madopar Rapid (dispersible)
• Madopar tablets (plain tablets)
• Madopar capsules (plain capsules)
• Madopar HBS (slow release capsules)
Example: Let’s check our resources

<table>
<thead>
<tr>
<th>Form</th>
<th>Brand names</th>
<th>Available strengths</th>
<th>Quick guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tablet (dispersible)</td>
<td>Madopar Rapid 62.5</td>
<td>50 mg-12.5 mg</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Madopar Rapid 125</td>
<td>100 mg-25 mg</td>
<td></td>
</tr>
<tr>
<td>Tablet (plain)</td>
<td>Madopar 125</td>
<td>100 mg-25 mg</td>
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<tr>
<td></td>
<td>Madopar 250</td>
<td>200 mg-50 mg</td>
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<tr>
<td>Capsule</td>
<td>Madopar 62.5</td>
<td>50 mg-12.5 mg</td>
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<td></td>
<td>Madopar 125</td>
<td>100 mg-25 mg</td>
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<tr>
<td></td>
<td>Madopar 250</td>
<td>200 mg-50 mg</td>
<td></td>
</tr>
<tr>
<td>Capsule (prolonged release)</td>
<td>Madopar HBS 125</td>
<td>100 mg-25 mg</td>
<td></td>
</tr>
</tbody>
</table>
Example continued

- Patient’s swallowing difficulties persist and he requires enteral feeding.
- Can Madopar be put down a tube?

<table>
<thead>
<tr>
<th>Tablets (dispersible)</th>
<th>Use Method A&lt;sup&gt;1&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enteral feeding tube</td>
<td>- Tablets may be dispersed in 10 mL water&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Use within 30 minutes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Mix well immediately before administration to ensure entire dose is given&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Give at the same time each day consistently in relation to feeds&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Suitable for tubes 8 French or larger&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>- Jejunal administration is likely to result in faster onset of action&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
Common complications of enteral tubes

• Tube blockages: inadequately crushed tablets.
• Diarrhoea related to the sorbitol content of syrups.
• Changes in drug absorption resulting in changed therapeutic effect.
• Drug/nutrient and drug/drug interactions.

Outcomes include:
• Interruption to patient care
• Increased morbidity and mortality rates
Other forms of the same drug or similar drug:

- Crushing hard tablets and mixing the resulting powder with water changes the intended formulation of the drug.
- This should be done as a last resort.
- Check for suitability before crushing and administering this way.
- Consider using: a solution or a suspension; dissolvable tablets or effervescent tablets.

Enteric Coated Drugs:

- Protect the gastric mucosa
- Delayed absorption until drug reaches small bowel
- Gradual release over time
- Manufacturers guidelines must be followed
Common preparations unsuitable for crushing

- CD - Controlled Dissolution
- CR - Controlled Release
- EC – Enteric Coated
- ER- Extended Release
- HBS- Hydro-dynamically Based System (floating capsules that gradually release drug)
- LA –Long Acting

- MR – Modified Release
- Retard –Delayed Release
- SA- Sustained Action
- SR- Slow Release
- XR- Extended Release
- XL- Modified Release
Modified release formulations

- Designed to be delivered over an extended period – usually 12 hours
- Can achieve a sustained blood level for a longer period of time (Oral hypoglycaemic agent)
- Allows the patient to reduce the number of medications, frequency of administration and overall compliance is improved
- Crushing the drug can potentially predispose the patient to drug overdose because of the change in therapeutic effect
- Crushing contraindicated by manufacturers instruction
- Be aware of labelling used on MR drugs- coding
- Check for suitability of opening capsules
- Powder versus granules
- Some granules are too large for small bore lumen tubes
- Take care when crushing medications using pestle and mortar – inhalational risk

Cytotoxic tablets must not be crushed or broken due to risk of exposure
Safe administration of drugs via enteral tube

- Check tube placement is correct
- Stop the feed
- Flush the tube
- Crush only what can be crushed
- Crush to a fine powder and dilute in water and administer separately
- Flush after each drug
- Use an oral/enteral dispenser for oral/enteral medications
- Oral dispensers have non-luer tip and are *incompatible* with IV admin devices – preventing wrong route errors
References


• 02002/Procedure: Medications Management, Effective from: September 2013, Review due: September 2016, Royal Brisbane and Women’s Hospital

• 09406/Procedure: Administration of medication to adult patients with dysphagia and / or enteral feeding tubes, Effective from: April 2015, Review due: April 2018. Royal Brisbane and Women’s Hospital

• Australian Don’t Rush to Crush Handbook (Second Edition), Distributed by MIMS Australia © The Society of Hospital Pharmacists of Australia,
Any questions?