# What are the considerations when crushing tablets or opening capsules in a care home setting?

Prepared by UK Medicines Information ([UKMi](http://www.ukmi.nhs.uk/ukmi/about/default.asp?pageRef=1)) pharmacists for NHS healthcare professionals

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Background
Tablets and capsules are the most commonly prescribed formulation of medicine. However swallowing difficulties is a common problem. Patients who have problems swallowing or those who are fed via feeding tubes (e.g. nasogastric (NG), nasojejunal (NJ), percutaneous endoscopic gastrostomy (PEG) tubes) cannot use tablets or capsules in their whole solid form. When administering medication via feeding tubes (PEG, NG, NJ) other issues need to be considered. If medicines are given via the feeding tubes without the correct advice, drug bioavailability may be altered, tubes may become occluded or drugs may bind to the feeding tube (1). Before giving medicines via feeding tubes always obtain advice from a pharmacist or prescriber.

In a care home setting, there may be a need to identify alternative ways of giving solid oral dose formulations and consider the consequences of manipulating formulations. In these circumstances, medication may need to be administered off-licence e.g. crushing or opening solid dose forms. There is a supplementary MQA entitled ‘[What are the therapeutic options for patients unable to take solid oral dosage forms](https://www.sps.nhs.uk/articles/what-are-the-therapeutic-options-for-patients-unable-to-take-solid-oral-dosage-forms/)?’ (and an [aid memoire](https://www.sps.nhs.uk/articles/academic-detail-aid-for-prescribers-d-choosing-medicines-for-patients-unable-to-take-solid-oral-dosage-forms-qa-307-1/)) which covers the options in more detail.

Incorrect crushing of medication is a common source of medication error in care homes (2). Crushed medication is nearly eight times more likely than tablets to give rise to a medication administration error in a care home. Prescription medications should only be taken according to the directions of a prescriber. Medicines used in a different way from what the manufacturers have stated are being used off-licence which means the manufacturer does not accept responsibility for any harm caused by taking the medicine in this way (3). A person giving crushed tablets or opened capsules to a patient without directions from the prescriber and without making the appropriate checks could be held liable for any harm caused (1;3).

But what issues need to be considered before medicine is administered in this way in a care home setting?

**Answer**In certain circumstances tablets may need to be crushed or capsules opened, but crushing a tablet or removing powder or granules from a capsule might affect the way a medicine works and may even cause side effects. Therefore before doing this the following options should be considered:

* Consider **is the medication essential?** It might, in some instances, be more appropriate to stop therapy, either temporarily or long term. However, before stopping any medication the prescriber should always be contacted.
* Consider whether the medication can be given in a **different licensed formulation**. For example dispersible/soluble tablets, liquid preparations, patches which can be applied to the skin, suppositories or injections (4;5). This information can be found in the British National Formulary (BNF), but a pharmacist or prescriber should always be consulted as changes to the amount of medicine or how often it is given may need to be made.
* In some cases a **different medicine** can be prescribed that does not need to be swallowed whole or is available as an alternative formulation.
* Consider a ***specials* formulation**. These are unlicensed medicines that do not have a UK or European marketing authorisation (6). They are produced to meet the needs of an individual patient. A *special* should not be supplied when an equivalent licensed product can meet patient needs. Specials have not been assessed by the regulatory authority for safety, quality and efficacy in the same way as a licensed product (7). In addition, they do not come in standard strengths (which can lead to confusion and error) and may have short expiry dates and be very expensive.

Before a person crushes tablets or opens capsules to administer to a patient, a pharmacist should always be consulted to find out if this is possible and this should be approved by the prescriber.

Changing the way in which a dosage form is presented can alter its absorption characteristics, result in medicines instability, produce local irritant effects, cause failure to reach the site of action, may produce occupational health and safety issues, and could result in a preparation with an unacceptable taste (8). For example:

* **Soluble tablets.** These will dissolve completely when placed in water to give a solution of the drug (9). The tablet must be completely dissolved before administration.
* **Effervescent tablets.** These are tablets where more than 75% of the bulk of the tablet contains inert agents designed to make the tablet effervesce (9). These formulations will produce a gas when placed in water that breaks the tablet up. They usually require a large volume of water and often have a high sodium content.
* **Dispersible tablets.** These tablets disintegrate in small amounts of water to give particles that may or may not suspend in the water (9). This can be problematic in blocking fine bore feeding tubes.
* **Modified release (slow or extended release) tablets or capsules**. These can be identified by the abbreviation such as LA (long acting), SA (sustained acting), CR (controlled release), XL (extended release), SR (sustained release) or M/R (modified release) after the brand name on the medicine box. Words such as ‘Retard’, ‘Slow release’ or ‘Continus’ are also sometimes used. It is essential that these medicines are swallowed whole. If these medicines were crushed, the dose is released over five to ten minutes as opposed to, for example, 12 to 24 hours. This results in an initial release of high dose medication that could be dangerous, followed by a subsequent period without medication (1;8). Some capsules contain modified release pellets and in these instances, the preparations may be opened and the contents mixed with liquids or soft foods for administration (10). The capsule contents however should never be crushed and patients should be advised not to chew the contents before swallowing. (5;10). A pharmacist should always be consulted before opening the capsule.
* **Enteric coated tablets or capsules**. These can be identified by the abbreviation EN or EC at the end of the medicine name on the medicine box. These tablets and capsules have a special coating and if crushed or opened, the medicine may be destroyed in the stomach or cause gastrointestinal disturbances such as indigestion or ulcers, e.g. diclofenac (1;8).
* **Film coated preparations**. Film coats are used for a variety of reasons and this should be ascertained before crushing or dispersing preparations. If the coating is there to mask the taste, the tablet may be unpalatable once crushed, e.g. ibuprofen, quinine, ciprofloxacin, cefuroxime (5;8;10). In some cases, coatings are added to protect the drugs from the effects of light, e.g. nifedipine (8) or to protect the patient from localised effects such as sertraline having an anaesthetic effect on the tongue when in powdered form.
* **Hormone, steroid, antibiotic or chemotherapy (cytotoxic) medicines.** Crushing or opening any of these tablets or capsules may cause some of the medicine to go into the air as dust particles. The particles may cause side effects to the person crushing the tablets or anybody else nearby (4;5;11). Measures must be taken to prevent skin contact and inhalation by wearing gloves and/or masks (5), and advice taken from a pharmacist on how to safely prepare the product for administration. Examples include: tamoxifen, methotrexate, valganciclovir, oral contraceptives, dexamethasone, finasteride, and alendronate (8).
* **Narrow therapeutic window.** Crushing oral dosage forms may produce changes in drug pharmacokinetics and bioavailability resulting in under-dosing or adverse effects. Such changes may be particularly important for drugs that work within a narrow drug plasma concentration such as phenytoin, digoxin, carbamazepine, theophylline and sodium valproate.

Powders or some other dosage forms can be added to beverages and foods although data to support this are lacking, and no single food or beverage will be suitable for all drug substances (8).

Patient monitoring is advisable for certain drugs when crushed and administered, e.g. blood pressure monitoring for nifedipine, glucose monitoring for metformin, etc (8).

**Summary**

* In the first instance consider how essential the medication is and whether alternative formulations (e.g. liquids, patches or sublingual tablets) or medications can be used.
* Before a person crushes or opens a medication, a pharmacist should always be consulted to find out if this is possible and this should be approved by the prescriber and documented in patient records.
* There are solid dose formulations that should never be crushed or opened without appropriate advice from a pharmacist such as some enteric coated tablets or capsules, modified release preparations, hormone, steroid, antibiotic or chemotherapy (cytotoxic) medicines.
* Additional patient monitoring may be required which the pharmacist will advise on.
* When administering medication via feeding tubes (PEG, NG, NJ) other issues need to be considered. If medicines are given via the feeding tubes without the correct advice, drug bioavailability may be altered, tubes may become occluded or drugs may bind to the feeding tube.

Limitations
This document gives general guidance only and a pharmacist should be consulted for drug specific advice. This document does not consider covert administration (concealing medication in foods or liquids) for which there is a separate MQA entitled ‘[What legal and pharmaceutical issues should be considered when administering medicines covertly](https://www.sps.nhs.uk/articles/what-legal-and-pharmaceutical-issues-should-be-considered-when-administering-medicines-covertly-2/)’ available.

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**Quality Assurance**

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### Search strategy

* Embase **"((exp TABLET/ OR MICROCAPSULE/ OR "DRUG CAPSULE"/) AND ((opening).af OR (crushing).af)) [DT 2016-2018]"**
* Medline "(**(exp "HOME CARE SERVICES"/ AND ((crushing).af OR (opening).af)) [DT 2016-2018])**"
* Micromedex
* NICE evidence “crushing” since 1st December 2016
* Google ((“crushing tablets” OR “opening capsules”) AND “care home”))
* Specialist text books
* Cochrane Library
* Dynamed Plus
* PrescQIPP
* UpToDate