



# The Medicine Cabinet: Some Medicines Don't Mix

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Interactions between drugs can have desired, increased, reduced or unwanted adverse effects. The probability of these interactions increase with each medication added to a person's treatment regime. Medications taken can include prescription medication, complementary or alternative medicines (CAM) and pharmacy medicines. Pharmacy (or over the counter) medication is medication purchased in a community pharmacy, does not require a prescription, and is often recommended by the community pharmacist, medical practitioner, allied health clinician or anybody else. Complementary or alternative medicines include:

- natural and herbal medicines
- alternative or holistic remedies
- traditional remedies
- homeopathy
- aromatherapy oils
- vitamins and minerals (although these can be part of medical treatment too).

People assume that taking medications will make them better or help with a specific health issue for which they were prescribed, but sometimes medications cause adverse effects (see previous article in *Journal of Mental Health for Children and Adolescents with Intellectual and Developmental Disabilities: An Educational Resource Volume 6 issue 1*). When a person is already taking medication, adding an additional prescription, pharmacy or over the counter medication, or CAM preparation may have beneficial effects but the interactions between them may also cause increased adverse effects or even serious side effects.

When a patient is being treated by one medical specialty team it is important that all professionals who are involved in the patient's treatment are

informed about changes in medication regimen (e.g., changes in doses or types of medications). This is important for people with intellectual or developmental disabilities and/ or autistic spectrum disorder (ASD) who may be taking a number of different medications, and may also be treated by numerous health professionals, all of who may have a different perspective on the use of medications.

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Medication changes should not be considered in isolation but in the context of the whole clinical picture to minimise adverse events. Medications are eliminated from the body in many different ways. Accordingly medications can compete with each other and may also be affected by diet. The lack of clinical trials of combinations of medications also adds to the complexity. Further, several individual medications may need to be trialled to establish a suitable regimen. Even a stable regime can be upset due to subtle interactions occurring between the medications or due to other factors such as illness. However there are some examples in the literature where several medications, for example for high blood pressure, minimises the side effects and have mutually additive effects to improve management.

Drug interactions occur at two levels, that is at pharmacokinetic or pharmacodynamics levels.

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Pharmacokinetic interactions occur through the absorption, elimination and metabolism of the drug. Pharmacodynamics interactions are the additive or antagonistic effects of medication at the cellular receptor site.

## **Metabolism Interactions** (body interacting with medication)

Interactions affecting medications can be caused by the competing nature of metabolic enzymes in the body. All medications are xenobiotics or foreign chemical substances to the body, and are predominantly metabolised by the enzymes in the liver called CYP450 enzymes (CYP450 is named cytokines identified by the X-ray crystallography at a wavelength of 450). These enzymes are being closely studied but as yet only some can be identified by their genetic profile. These genetics are used to identify drug metabolism patterns, for example, poor, extensive and ultra-fast metaboliser. The genetics have been established for 2D6 and 2C19 isoenzymes but the main metabolising enzyme for most pharmaceuticals is 3A4; for which the genetics have not yet been established but for which variation between people has been recognised.

When medications are metabolised by these isoenzymes, there may be natural competition in the metabolism. Medications can be inhibitors or inducers of the isoenzymes and thus affect another medication's metabolism. A common example of this is carbamazepine (Tegretol®, Teril®) and erythromycin, whereby as the blood levels of carbamazepine are increased, the effectiveness of the erythromycin given in combination is decreased. Another example is the interaction between lamotrigine and the oral contraceptive pill. Stopping

the oral contraceptive pill increases the lamotrigine level by 33%, and the dose should be reviewed to avoid side effects.

Grapefruit and its juice is a food example of this interaction, and is often indicated by this auxiliary label that may be attached to prescription medications. Grapefruit juice contains a number of polyphenolic compounds including flavanone naringin and furanocoumarins which inhibit the metabolism of CYP3A4, leading to increased blood levels of some medications. The effects of grapefruit juice on the metabolising enzyme can last up to 24 hours.



**DO NOT EAT GRAPEFRUIT OR  
DRINK GRAPEFRUIT JUICE  
WHILE TAKING THIS MEDICATION**

## **Pharmacodynamic Interactions** (medication affecting the body systems)

Medications can interact with bodily functions. For example, clonidine and quetiapine or olanzapine given together can cause an increase in the sedation, dizziness and a drop in blood pressure. Other medications when given in combination can increase the risk of urinary retention or an increase in dry mouth, for example when amitriptyline and olanzapine are given together.

SSRI antidepressants can interact with St John's Wort, a herbal product known to be helpful in mild depression. This combination can lead to serotonin toxicity, which if severe, can be fatal.

### Continuing medicines no longer prescribed

As a person's health condition changes, or when new treatments become available, it is important to follow the advice of the treating doctor and the recommended medication regime. Changes in the medication regimen from the original could lead to new adverse effects. As always, changes should also be shared with all the healthcare professionals involved in the person's care. This also involves making sure the community pharmacy managing the prescriptions is aware of the changes so that accidental dispensing of ceased medications does not happen which could cause both financial and medical damage. This is especially important if the patient/carer has signed up for automatic or courtesy refills.



### Tips to prevent interactions between drugs

- Tell all health professionals about the medications and complementary products that are being taken. An easy way to remember them all is to have them stored on Medicines App (see the example below).
- Make sure everyone is aware when there are changes in the types of medications or doses.
- When switching between medications make sure that the plan is understood and adhered to, so that one medication is ceased when another is started. Too many medications in the same class may lead to many adverse effects.
- Dispose of unused or no longer required medications so that they are not taken or given by mistake.
- If unsure about changes in medication, consult the prescriber and make sure that they have shared this information with all professionals or teams involved.
- Refer back to the GP if experiencing new symptoms or sudden health changes as these could be medication related.

### Other resources:

From ISMP newsletter Safe medicines accessed 16/2/17 <http://www.ismp.org/newsletters/consumer/showarticle.aspx?id=19>

SafeMedicationUse.ca – Some Medicines Don't mix accessed from [www.safemedicationuse.ca](http://www.safemedicationuse.ca) accessed 16/2/17

<http://www.nps.org.au/topics/how-to-be-medicinewise/side-effects-interactions> accessed 22/2/17

<http://www.nps.org.au/topics/how-to-be-medicinewise/using-complementary-medicines> accessed 22/2/17

Grapefruit juice <https://www.fda.gov/ForConsumers/ConsumerUpdates/ucm292276.htm> accessed 28/2/17