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DO MEDICATIONS REALLY EXPIRE?

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What does ' expiry date' really mean ?

If you see a bottle of Paracetamol in your fridge which expires in September 2013, would you still administer that to your sick baby ? Will it have lost its potency? or do you think it will still be able to bring the fever down? Or should you just discard it?

The expiration is required by law since 1979 in the United States, and it means only **the date the manufacturer guarantees the full potency and safety of the drug** -- it does not mean how long the drug is actually "good" or safe to use. Studies show that expired drugs may lose some of their potency over time, from as little as 5% or less to 50% or more (though usually much less than the latter).

For legal and liability reasons, manufacturers will not make recommendations about the stability of drugs past the original expiration date. Therefore in a hospital setting where full potential of the drug is needed to determine utmost efficacy, we should still discard drugs after expiry dates if there are no extended stability tests done by the manufacturer.

The expiration date of a drug is estimated using stability testing under good manufacturing practices as determined by the Food and Drug Administration (FDA), which includes upper and lower limits for the active pharmaceutical ingredient (API) in each dose unit. Stress tests are then conducted to estimate how quickly a drug will deteriorate under short term exposure of heat, light, oxidation and humidity. This helps us understand degradation pathways better. For liquid and injectables, there will be additional tests for bacterial purity and chemical stability.

Once the original container is opened, that original expiration date on the container could be shorter than stated. However, the actual shelf life of the drug may be much longer, as stability studies have shown. The shelf life of products is determined by either the break down of the active drug or by risk of contamination.

At the pharmacy, "beyond-use" dates are often put on the prescription bottle label given to the patient.

Depending on the product, the expiry date may be set as a fixed time

- after manufacture
- after dispensing
- after opening of the manufacturer's container

Is it safe to take expired medications?

The first concern related to expired drugs is whether they are potentially harmful if consumed. Reassuringly, there is no published data to suggest harms from use of drug formulations after their expiry data. There is one rare example of degraded tetracycline causing renal tubular damage dating back to the 1960's (reported by G. W. Frimpter and colleagues in *JAMA*, 1963;184:111). Some scientists dispute that it could have been caused by a chemical transformation of the active ingredient. The lack of documented harms suggests that degradation of useful chemicals into toxic compounds is rare, if it occurs at all.

Solid dosage forms, such as tablets and capsules, appear to be most stable past their expiration date except for moisture– sensitive drugs like nitroglycerin and montelukast. Drugs that exist in **solution or as a reconstituted suspension, and that require refrigeration (such as amoxicillin suspension), may not have the required potency if used when outdated.** One of the most unstable life saving drug is Epinephrine for injection (Epipen ®), which degrades consistently after expiration.

Loss of potency can be a major concern especially with life-saving drugs. Additionally, antibiotic resistance may occur with sub-potent medications. Drugs that exist in solution, especially injectable drugs, should be discarded if the product forms a precipitant, looks cloudy or discoloured.

Some herbal products are given expiry dates. Note that these are arbitrary especially if the active ingredients of herbals are unknown or difficult to measure. If you can't verify the amount of active ingredients in herbal products, you can't verify it's stability.

Thus, expiry dates are conservative. When absolute potency is needed for quality of products, stick to drugs that are not expired.

Wording on packaging	Definition
Best before January 2014	Discard 31/12/2013
Use before end January 2014	Discard 31/01/2014
Use by January 2014	Discard 31/12/2013
Discard after January 2014	Discard 31/01/2014
Expires January 2014	Discard 31/01/2014

→Examples of different wordings of expiry dates (SCHBPG Medicines Management Task Group June 2013)

Key points for basic storage guidelines :

- Keep all medication in the original container in which they were dispensed (If supplied with dessicant, do not remove the dessicant)
- Keep medicines in their original outer packaging, to protect from sunlight
- All medicines should be stored in the coolest, dry place unless refrigeration is required (between 2° and 8°C) (not in bathroom cabinets, or in a hot car)
- Record the date opened and the calculated expiry on the medicine package/label
- Dispose expired drugs in ways that minimizes potential environmental harm.

Reference:

- Expiry-Dates-Guidance-Oct-2013.pdf
- www.drugs.com/article/drug-expiration-dates
- http://www.health.harvard.edu
- Medscape
- Science based medicine.org

PPUKM ADR Reports Collected by Drug Information Pharmacy PPUKM and Analysed by MADRAC (Malaysian Adverse Drug Reaction Advisory Committee) (2013)

By Nur Faezah Binti Mohamad Ariff

Therapeutic class	Suspected drug(s)	ADR	Onset	Causality
A	Granisetron (Kytril)	Anxious, agitation	1 hour	C3
A	Metoclopramide (Maxolon)	Spasm of mouth and limbs	20 min	C3
A	Metformin (Glucophage)	Headache, GI upset	1 hour	C2
J	Vancomycin	Decline in white cell count	9 days	C3
J	Azithromycin (Zithromax)	Vomiting, Tachycardia	9 days	C2
J	Clarithromycin (Klacid)	Memory, cognitive impairment	3 days	C2
J	Fluconazole (Diflucan)	Thrombocytopenia	1 month	C3
J	Ampicillin & Sulbactam (Unasyn)	Itchiness, erythematous	1 day	C3
J	Tenofovir 300mg/ Emtricitabine 200mg (Tenvir-EM)	Lactic acidosis	1 month	C2
J	Rifampicin	Maculopapular rash	18 days	C3
L	Docetaxel (Taxotere)	Bullous vasculitis	1 day	C1
L	Bortezomib (Velcade)	Reduce sensation over limbs	2 days	C3
L	Cyclophosphamide (Endoxan)	Developed acute hepatitis	1 day	C2
L	Ciclosporin (Sandimmun)	Hypertension, hot sensation	9 days	C2
C	Telmisartan/Amlodipine (Twynsta)	Angioedema	4 days	C2
M	Allopurinol (Zyloric)	Skin Eruptions, Macular Palpullar	1 day	C1
M	Etoricoxib (Arcoxia)	Itchiness	2 days	C3
D	Lidocaine / Prilocaine (Duocaine 5% Cream)	Severe vertigo	2 minutes	C3
N	Inh. Sevoflurane (Sevorane)	Malignant hyperthermia	2 hours	C2
N	Tramadol (Tramal)	Itchiness	2 days	C3

EVALUATION OF ADRS REPORTED

(by National Pharmaceutical Control Bureau)

WHO Causality Scale
(Total score of overall probability)

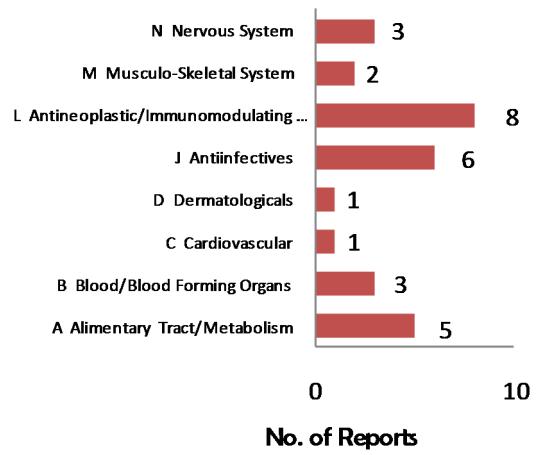
C1- Certain Score > 9

C2- Probable Score > 5-8

C3- Possible Score > 1-4

C4- Unlikely Score < 0

Adverse Drug Reactions By Pharmacological Group (Jan -Dec 2013)



Information Frequently Missed by ADR Reporters

Any **history** of allergy (drugs, food etc.)?
Any concomitant medications? (Please **state 'nil'** if none) Date started and stopped for each medication If medication is continued after the ADR, please state 'cont'
Any underlying illnesses?
Specific indication of the suspected drug (eg. Pneumonia due to S. Pneumoniae' – **avoid generic terms** such as 'infection' or 'antibiotic')
If the ADR reappeared after reintroducing drug, please describe the rechallenge fully (**dose** given, **timing** etc.)
Was any treatment given for the ADR? (Please describe)
What is the latest/current outcome for the patient? (eg. recovered)
Description of specific type and location of skin reaction (Use the Cutaneous ADR form available on www.bpfk.gov.my)
Keep your own record of details enabling you to contact patient/ trace case notes later on if necessary (eg. IC number, **patient name**, **phone number**)

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