Prescribing Principles

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Outline

1. Obtaining a thorough medication history
2. Starting and stopping medications
3. Dosing
4. Drug interactions
5. Off label prescribing
6. Documentation
7. Examples of how to write (and not write) prescriptions

Obtaining a Thorough Medication History (BPMH)

+ How do you currently take medication histories?

- What questions do you ask?
- What sources of information do you use?

Components of the Best Possible Medication History (BPMH)

1. All current and relevant past medications (Rx and non-Rx), & complimentary/alternative medications (CAMs)
2. List, for each item, the dose, dosage form, frequency, route, indication, level of patient adherence & info source
3. Information sources: the patient, patient's family, Rx vials/packages, pharmacist/pharmacy, PharmaNet (in BC) primary care provider, & specialists.
4. Assess appropriateness of therapies
5. Identify and reconcile DISCREPANCIES (what the patient is doing vs. what the care provider believes)

http://www.saferhealthcarenow.ca/
www.canadapharma.org (Knowledge is best Medicine)

Medication History: TIPS

+ Use both open-ended questions (what, how, why, when) and yes/no questions
+ Use a systematic approach to best get complete information (e.g., meds over last 24 hrs or head to toe)
+ Non-judgmental approach
+ Keep it simple: e.g., avoid medical jargon
+ Avoid leading questions
+ Explore vague responses (non-compliance)
+ Prompt for specific types of medications (e.g., pain, sleep, GI, eye/ear drops, patches, creams/ointments, inhalers)

Medication History Sample Questions

Medication History Script

Allergies
- Do you have an allergy to or avoid any medications due to side effects?
- What type of reaction do you have?

Prescription Medications
- What prescription medications do you take on a regular basis?
- When do you take them?

Non-prescription Medications
- What non-prescription over-the-counter medications do you take on a regular basis?
- When do you take them?

Herbals, Supplements, Vitamins
- What herbal, natural or homeopathic remedies do you take?
- What vitamins or minerals do you take?
- When do you take them?

Additional Questions

Do you use any:
- Eye drops
- Nose sprays
- Puffers (inhalers)
- Medicated lotions or creams
- Medicated patches

Do you receive any:
- Needles (injections)
- Samples from the doctor's office
- Study medications

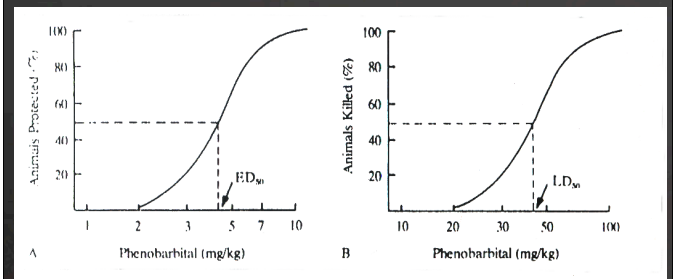
Do you take any medication on a regular basis for:
- Sleep
- Your stomach
- Your bowels
- Pain

Did you or your doctor recently change or stop any of your medication?

Dosing principles

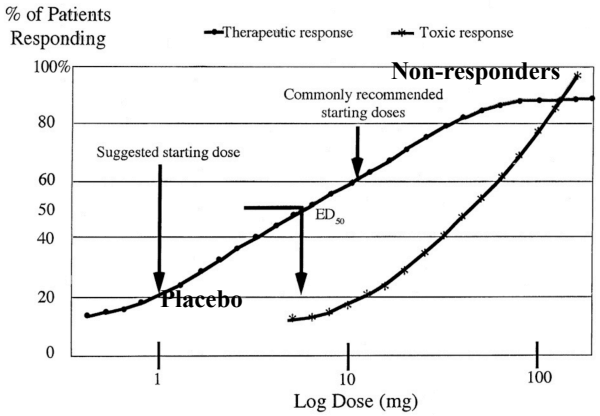
1. For the majority of conditions there is rarely a need to get an immediate result
2. For many marketed drugs, the recommended starting doses are too high
3. The placebo group response (not the placebo effect) for numerous conditions is approximately 20-40%
4. There is no reliable way to predict how a patient will respond to a drug (pharmacodynamics) or how they will eliminate a drug (pharmacokinetics)
5. Approximately ¾ of side effects of drugs are dose related

Seizure prevention Lethal overdose



Rat Data

Fig. 2-2. Quantal dose-response curves based on all-or-none responses. A. Relationship between the dose of phenobarbital and the protection of groups of rats against convulsions. B. Relationship between the dose of phenobarbital and the drug's lethal effects in groups of rats. (Data adapted from C. R. Craig and F. E. Shideman, J. Pharmacol. Exp. Ther. 176:35, 1971.)



Discussion with Patient

1. There is no urgency to getting a response - find the lowest effective dose for you over the next few months
2. No way to know ahead of time what dose is the "best" one for you
3. The typical recommend starting doses for many medications are too high
4. Starting with a 1/4 to an 1/8 of the dose - decrease the chance of side effects
5. Many conditions get better over time
6. "You" will determine the correct dose
7. You may get better because of the drug, or tincture of time effect

6.25 mg of hydrochlorothiazide	effective at lowering blood pressure –first marketed at 50 to 200 mg daily
6.25 mg of captopril	effective at lowering blood pressure as a single dose and when dosed chronically BID - captopril 25 mg PO TID is still a commonly recommended initial starting dose for hypertension
25 mg of sildenafil (Viagra)	effective dose for erectile dysfunction
25 mg of sumatriptan (Imitrex)	works almost as well as100 mg - most drugs in this class a flat dose-response curve is seen at the doses studied
5 mg daily of fluoxetine (Prozac)	effect similar to 20 mg 40 mg daily
0.25 mg of ezetimibe (Ezetrol)	1/40th of the recommended initial starting dose of 10 mg provides 50% of the LDL lowering effect seen with 10 mg
15 mg of elemental iron daily	as effective for anemia in the elderly as 50 mg and 150 mg with a lower incidence of side effects
150 mg daily of bupropion (Zyban)	produces the same rate of smoking cessation at one year as 300 mg daily
10 mg of atorvastatin	produces 2/3 of the effect on cholesterol as that seen with an 80 mg (8-fold increase) dose
200 mg of ibuprofen (Motrin)	as effective as 400 mg for migraine headache
25 mg of ranitidine (Zantac)	as effective as 125 mg for heartburn relief

Practical Suggestions

1. Not all drugs come in dosage forms that allow small doses to be used
2. The majority of tablets can be split - use a pill cutter
3. Some capsules can be opened
4. Increase the interval
5. Liquid form - pediatric dosage forms may be useful to start

Dosing

If Dying - Give lots
If No hurry - start with at most a 1/2, and maybe even 1/4 to 1/8

"Drugectomies"

in the beginning - until proven otherwise
Assume the drug is wrong
Assume the dose is wrong

Come up with a monitoring plan in conjunction with the patient
Cut dose in 1/2 for a week or two
Cut dose in 1/2 again for a week or two
Then stop

Drug Interactions

either pharmacodynamic or pharmacokinetic

1.Pharmacodynamic - result in additive or antagonistic pharmacological effects

2.Pharmacokinetic - involve induction or inhibition of metabolizing enzymes in the liver or elsewhere, displacement of drug from plasma protein binding sites, alterations in gastrointestinal absorption, or competition for active renal secretion

from http://www.nephrologypharmacy.com/downloads/druginteraction2e.pdf

http://www.drugs.com/drug_interactions.php

http://www.rxfiles.ca/rxfiles/uploads/documents/members/cht-herbal-di.pdf

iPhone app - medscape, Epocrates, Lexicomp, Micromedex

most important DDIs

Warfarin	Thyroid, NSAIDs, cimetidine, fibric acid, barbiturates, sulfinpyrazone
Benzodiazepines	Azoles
Carbamazepine	Propoxyphene, macrolides
Cyclosporine	Rifampin
Dextromethorphan	MAOIs
Digoxin	Clarithromycin
Ergots	Macrolides
Ganciclovir	Zidovudine
MAOIs	Sympathomimetics
Meperidine	MAOIs
Methotrexate	Trimethoprim
Nitrates	Sildenafil
Pimozide	Macrolides, azoles
SSRIs	MAOIs
Theophylline	Quinolones, fluvoxamine

Duplicate action drugs
Sedation
blood pressure
Potassium

J Am Pharm Assoc 2004;44:142–151

PPIs

Off Label Prescribing

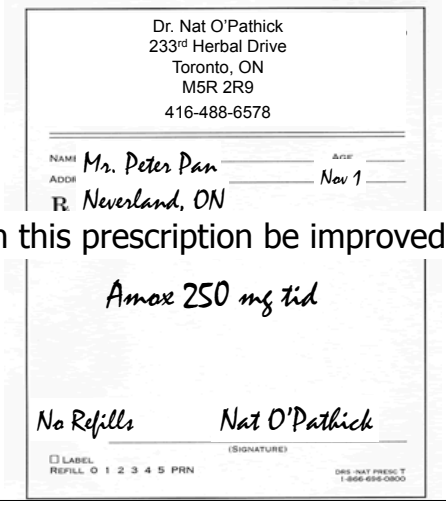
- Use of a prescription medication to treat a condition Health Canada has not granted an "indication"
- A medication that is "not indicated" for a particular use, is NOT necessarily contraindicated for that condition?
- How does a drug get an indication for a medical condition?
- What patient populations often do not have indications?
- Must consider each patient's circumstances when off label prescribing. Document your rationale and monitoring plan

Writing Prescriptions

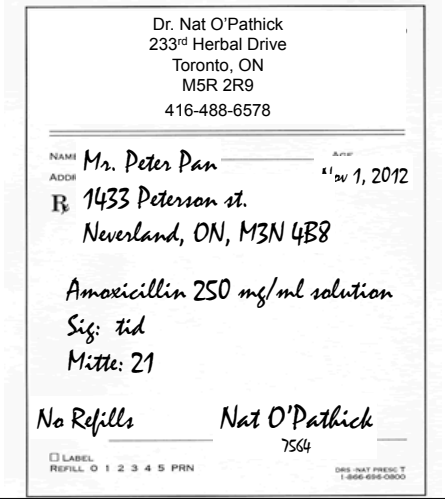
Prescription Requirements

ONTARIO College of Pharmacists

1. Date
2. Name and address of patient
3. Name, strength, quantity and form of drug or ingredient(s)
4. Directions for use (include frequency or interval or maximum daily use)
5. Refill authorization (# and interval between refills) - 0 if left blank
6. Name and College ID of practitioner
7. Signature



Can this prescription be improved?



Prescriber Information

1. Name
2. Address
3. Telephone number
4. College of Naturopathic Physicians Identity Number
5. Imprinted on blank prescription or personalized self-inking stamp
6. SIGNATURE

Ontario College of Pharmacists Legislation

- Prescriptions need to be either:
  - Written & signed
  - Dictated to a pharmacist by telephone (except straight narcotics)
  - Sent electronically (Faxed)
- Prescriptions for medications are active for 1 year from the date on the prescription (except oral contraceptives, which are 2 years)
- Pharmacists keep prescriptions for at least 2 years

Common Issues that <u>may</u> result in Medication Errors

+Illegible handwriting
+Use of abbreviations
+Incomplete directions
+Lack of patient information (allergies)
+Lack of appropriate dosing information (decimals & trailing zeros)

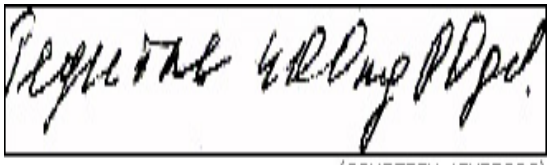
Prescription Checklist

1. Patient Name*
2. Address*
3. Age/weight
4. Purpose
5. Date*
6. Drug Name*
7. Manufacturer
8. Strength*
9. Mitte(Send)/Quantity*
10. Dosage form
11. Sig(Take)/Directions* (Include frequency & daily maximum if PRN)
12. Prescriber Signature*
13. ND ID Number*
14. Prescriber address and phone #*
15. Refills

Which medication is this?

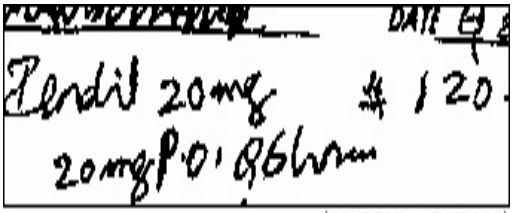
⇒ **Avandia** – rosiglitazone 4 mg
-antidiabetic

Coumadin – warfarin 4 mg
-anticoagulant



Tegretol (carbamazepine) 400 mg orally daily
-anticonvulsant

⇒ **Tequin** (gatifloxacin) 400 mg orally daily
-quinolone antibiotic



Plendil (felodipine) 20 mg orally every 6 hours
-Calcium channel blocker

⇒ **Isordil** (isosorbide dinitrate) 20 mg orally every 6 hours

Look Alike/Sound Alike Drugs

Bupropion vs. Buspirone
Plavix vs. Paxil
Adderall vs. Inderal
Metoprolol vs. misprostol
Tegretol vs. toradol
Lasix vs. Losec
Flomax vs. Fosamax
Atarax vs. Ativan

National association of Chain Drug Stores has a list www.nacds.org

Additional Prescribing Tips

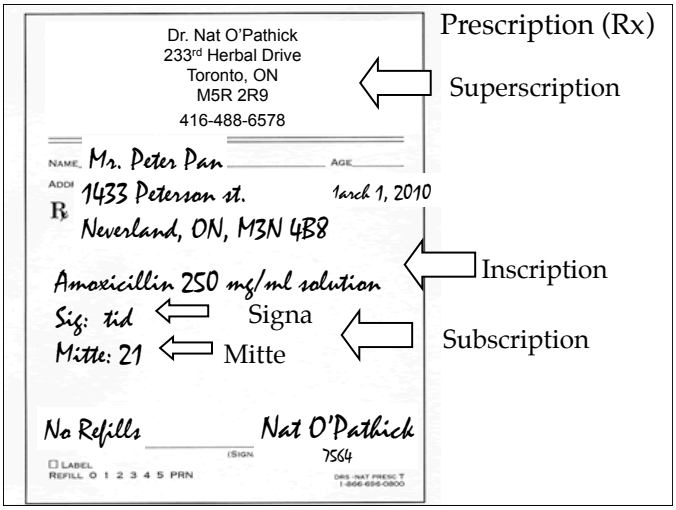
1. Consider including diagnosis or purpose (if appropriate)
+ helps confirm medication and provide context for consitent education

2. For children or those < 40 kg
+ Include age or weight
+ List mg/kg dose you used (pharmacist to double check and confirm dose)
+ List dosage form (e.g., liquid preferred)

3. Use generic drug name

4. If you don't want substitution of your prescription, write the manufacturer's name OR "Do Not Substitute"

5. Specify: # of Refills and time interval between refills e.g. Repeat 3 x q 30 days



Types of Signa (Directions)

- Usually uses a standard Latin abbreviation
- Useful shorthand for physicians
- Aids pharmacists detect forged prescriptions
- Common Signa: qd, bid, tid, qid, q8h,hs,PRN, pc
- Note: PRN (alone) is not acceptable when used alone…must include specific frequency, interval or MAX DAILY DOSE and preferentially indication for use
- e.g. qHS PRN sleep

Common Latin Rx Terms

Latin	Abbrev.	Meaning
Bis in die	bid	Twice a day
Ter in die	tid	3 times
Quarter in	qid	4 times
Ante cibum	ac	Before
Post cibum	pc	After meals
Hora somni	hs **	At bedtime
Pro re nata	prn	As needed
Quaque die	q 3 h	Every 3
Per os	po	By mouth

Abbreviations to avoid (ISMP)

Abbreviation /Dose Expression	Intended Meaning	Misinterpretation	Correction
Apothecary symbols	dram minim	Misunderstood or misread (symbol for dram misread for "3" and minim misread as "mL").	Use the metric system.
AU	aurio uterque (each ear)	Mistaken for OU (oculo uterque—each eye).	Don't use this abbreviation.
D/C	discharge OR dis-continue	Premature discontinuation of medications when D/C (intended to mean "discharge") has been misinterpreted as "discontinued" when followed by a list of drugs.	Use "discharge" and "discontinue."
Drug names		Don't abbreviate the drug name	Use the complete spelling for drug names.
No zero before decimal	0.5 mg vs .5 mg	Could be mistaken for 5 mg (if the decimal point is faint or not seen.	Use zero before a decimal
AZT	zidovudine (RETROVIR)	azathioprine	

ISMP Dangerous Abbreviations

CPZ	COMPAZINE (prochlorperazine)	chlorpromazine	
DPT	DEMEROL-PHENERGAN-THORAZINE	diphtheria-pertussis-tetanus (vaccine)	
HCl	hydrochloric acid	potassium chloride (The "H" is misinterpreted as "K.")	
HCT	hydrocortisone	hydrochlorothiazide	
HCTZ	hydrochlorothiazide	hydrocortisone (seen as HCT250 mg)	
MgSO4	magnesium sulfate	morphine sulfate	
MSO4	morphine sulfate	magnesium sulfate	
MTX	methotrexate	mitoxantrone	
TAC	triamcinolone	tetracaine, ADRENALIN,cocaine	

ISMP Dangerous Abbreviations

ZnSO4	zinc sulfate	morphine sulfate	
Zero after decimal	1.0 vs 1 mg	Misread as 10 mg if the decimal point is not seen	Do not use terminal zeros for doses
"Nitro" drip	nitroglycerin infusion	sodium nitroprusside infusion	
"Norflox"	norfloxacin	NORFLEX	
ug	microgram	Mistaken for "mg" when handwritten.	Use "mcg."
o.d. or OD	once daily	Misinterpreted as "right eye" (OD—oculus dexter)and administration of oral medications in the eye.	Use "daily."
TIW or tiw	three times a week.	Mistaken as "three times a day."	Don't use this abbreviation.
per os	orally	The "os" can be mistaken for "left eye."	Use "PO," "by mouth," or "orally."
q.d. or QD	every day	Mistaken as q.i.d., especially if the period after the "q" or the tail of the "q" is misunderstood as an "i."	Use "daily" or "every day."

qn	nightly	Misinterpreted as "qh" (every hour).	Use "nightly."
qhs	nightly	Misread as every hour.	Use "nightly."
q6PM, etc.	every evening at 6 PM	Misread as every six hours.	Use 6 PM "nightly."
q.o.d. or QOD	every other day	Misinterpreted as "q.d." (daily) or "q.i.d. (four times daily) if the "o" is poorly written.	Use "every other day."
sub q	subcutaneous	The "q" has been mistaken for "every" (e.g., one heparin dose ordered "sub q 2 hours before surgery" misunderstood as every 2 hours before surgery).	Use "subcut." or write "subcutaneous."
SC	subcutaneous	Mistaken for SL (sublingual).	Use "subcut." or write "subcutaneous."
U or u	unit	Read as a zero (0) or a four (4), causing a 10–fold overdose or greater (4U seen as "40" or 4u seen as 44").	"Unit" has no acceptable abbreviation. Use "unit."

IU	international unit	Misread as IV (intravenous).	Use "units."
cc	cubic centimeters	Misread as "U" (units).	Use "mL."
x3d	for three days	Mistaken for "three doses."	Use "for three days."
BT	bedtime	Mistaken as "BID" (twice daily).	Use "hs."
ss	sliding scale (insulin) or ½ (apothecary)	Mistaken for "55."	Spell out "sliding scale." Use "one-half" or use "½."
> and <	greater than and less than	Mistakenly used opposite of intended.	Use "greater than" or "less than."
/ (slash mark)	separates two doses or indicates "per"	Misunderstood as the number 1 ("25 unit/10 units" read as "110" units.	Do not use a slash mark to separate doses. Use "per."
Name letters and dose numbers run together (e.g., Inderal40 mg)	Inderal 40 mg	Misread as Inderal 140 mg.	Always use space between drug name, dose and unit of measure.

Protecting Prescription Guidelines

+ Minimize number of pads in use
+ Do not leave visible in office
+ Store in secure place (to avoid theft)
+ Consider writing amounts of desired medications numerically + alphabetically
+ Never sign Rx blanks in advance
+ Write Rx in ink
+ Do not use Rx blanks for notes or memos which can be erased and used for forgery

Documenting Your Prescription

When recommending a treatment for a patient, what information do you document?

Suggestions for Documentation when Writing a Prescription

1. Date
2. Subjective and observed symptoms
3. Assessment of the patient's problem (if known)
4. Purpose and/or Goal(s) of Medication(s)/ Treatment
5. Name, dose, dosage form and quantity of medication prescribed
6. Monitoring plan (efficacy and safety)
7. Discussion you had with patient about treatment and monitoring plan
8. Did you have 'informed consent'?
9. Signature

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Proton pump inhibitors (antacids): possible risk of *Clostridium difficile*-associated diarrhea

Information Update
2012-23
February 16, 2012
For immediate release

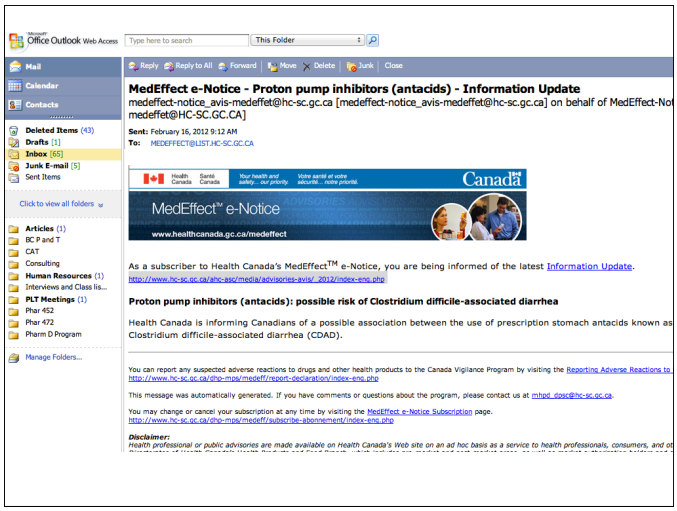
OTTAWA - Health Canada is informing Canadians of a possible association between the use of prescription stomach antacids known as proton pump inhibitors (PPIs) and an increased risk of *Clostridium difficile*-associated diarrhea (CDAD).

Clostridium difficile, commonly called *C. difficile*, is a bacterium that can cause diarrhea and may lead to more serious intestinal conditions. Healthy people are not usually vulnerable to *C. difficile*. Factors known to increase the risk of infection include advanced age, severe underlying illness, hospitalization, or antibiotic use.

PPIs reduce stomach acid and are widely used to treat conditions such as acid reflux, and stomach and small intestine ulcers. See below for a list of Proton Pump Inhibitors.

There have been a number of studies suggesting a possible link between PPIs and an increased risk of *CDAD*, particularly in vulnerable patients. Health Canada has been assessing this data on an ongoing basis.

The studies acknowledge important limitations with regards http://www.hc-sc.gc.ca/ahc-asc/media/advisories- impossibility of establishing a definite cause-and-effect relationship between PPIs and an increased risk of CDAD, as there are a number of other factors that may play a role.



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MedEffect e-Notice - Proton pump inhibitors (antacids) - Information Update

medeffect-notice_avis-medeffet@hc-sc.gc.ca [medeffect-notice_avis-medeffet@hc-sc.gc.ca] on behalf of MedEffect-Not
medeffet@HC-SC.GC.CA]

Sent: February 16, 2012 9:12 AM
To: MEDEFFECT@LIST.HC-SC.GC.CA

Health Canada Santé Canada | Your health and safety... our priority. Votre santé et votre sécurité... notre priorité. | Canada

MedEffect™ e-Notice
www.healthcanada.gc.ca/medeffect

As a subscriber to Health Canada's MedEffect™ e-Notice, you are being informed of the latest Information Update.
http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/_2012/index-eng.php

Proton pump inhibitors (antacids): possible risk of Clostridium difficile-associated diarrhea

Health Canada is informing Canadians of a possible association between the use of prescription stomach antacids known as Clostridium difficile-associated diarrhea (CDAD).

You can report any suspected adverse reactions to drugs and other health products to the Canada Vigilance Program by visiting the Reporting Adverse Reactions to
http://www.hc-sc.gc.ca/dhp-mps/medeff/report-declaration/index-eng.php

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