Regional Geriatric Program of Eastern Ontario
Programme gériatrique régional de l'Est de l'Ontario

Iatro-gerosis
How medications can cause more problems than they treat

Allen Huang, MDCM
Barbara Farrell, PharmD

Annual Geriatric Education Day
March 5, 2014

Regional Geriatric Program of Eastern Ontario
Programme gériatrique régional de l'Est de l'Ontario

We have no conflicts of interest to declare

Images included in this presentation are in the public domain and can be freely distributed

Learning objectives

- Participants will be able to:
  - Explain iatrogenesis
  - Identify medications that could contribute to Geriatric Giants (confusion, falls, weight loss, incontinence)
  - Develop plans to minimize the contribution of medications to Geriatric Giants
  - Discuss opportunities for physician/pharmacist collaboration

Outline

- 'Iatrogerosis'
- Common culprits
- Approaches to minimizing the impact of medications to Geriatric Giants
- Using the pharmacist as an ally

Definitions

- Physician
  - Profession that practices medicine – concerned with promoting, maintaining or restoring human health
  - Teacher, healer
  - Prescribes medications
- Pharmacist
  - Profession that ensures optimal drug therapy outcomes through patient-centred care http://www.blueprintforpharmacy.ca/
- Iatrogenesis
  - Originating from a physician (iatros)
- Geriatrics
  - Clinical care of older adults

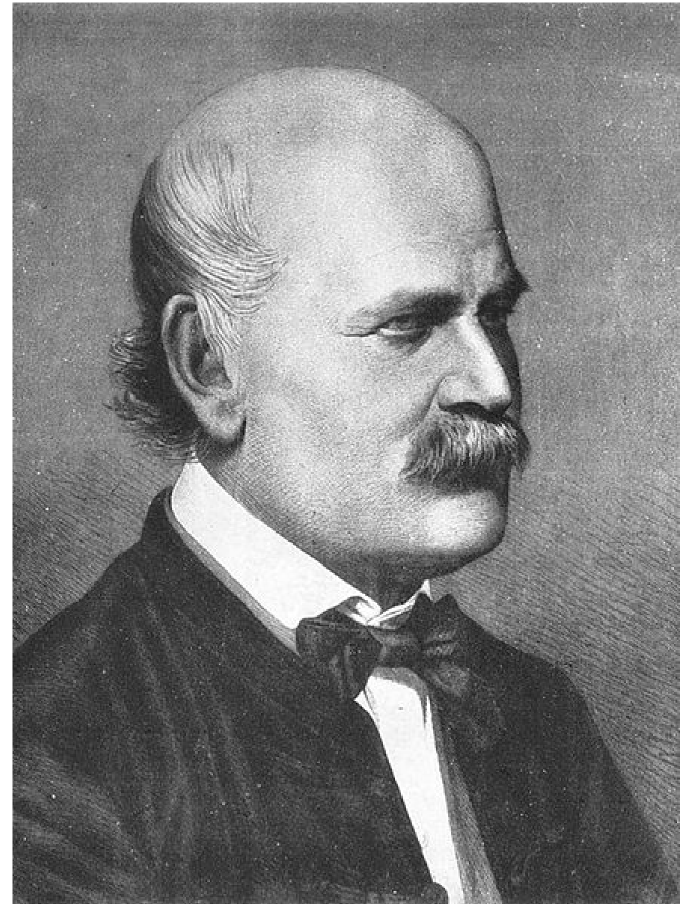
Drug Therapy

- Pharmacokinetics
  - What your *body* does to the *drug*
- Pharmacodynamics
  - What the *drug* does to your *body*
- Risk management
  - Beneficial effects of a drug
  - Side-effects
- Interactions
  - Drug-drug
  - Drug-disease
  - Drug-food,etc…

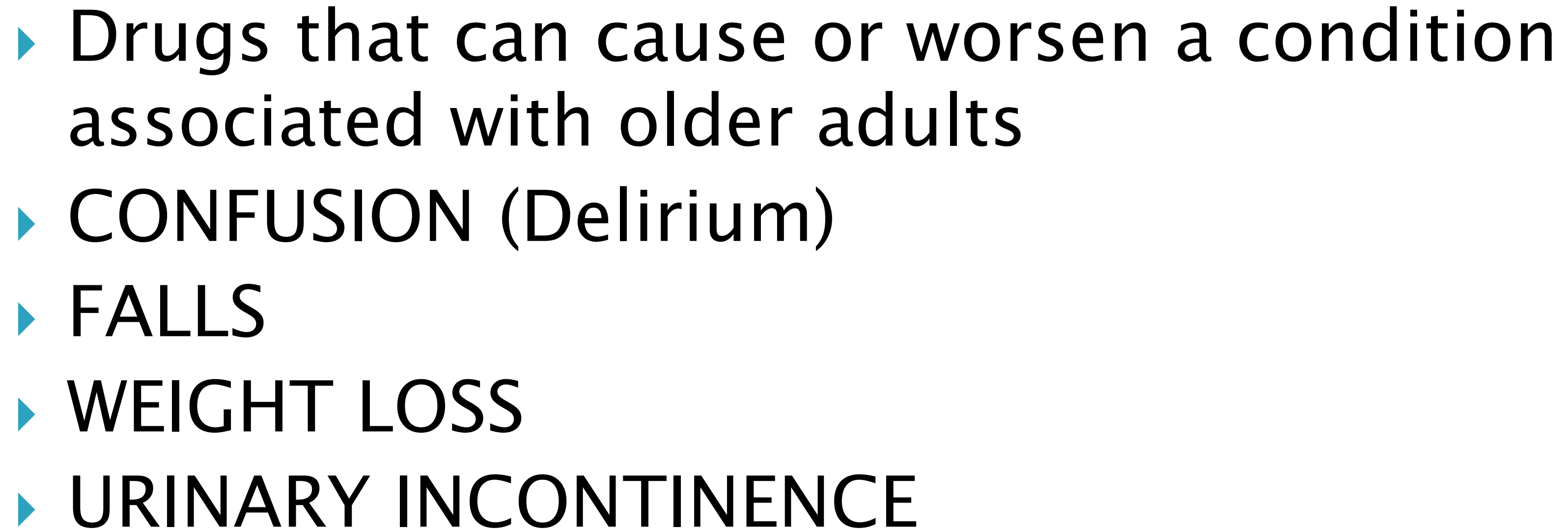
Ignaz Philipp Semmelweis (July 1, 1818–August 13,1865)
Hungarian physician of German extraction[

1847, while working in Vienna General Hospital's First Obstetrical clinic he noticed that the wards where ***doctors*** delivered babies had a 3 times higher mortality rate than the ***midwives'*** ward.

He observed that physicians would often go between the autopsy room after dissection to attend the maternity ward and deliver babies. He postulated that something was being carried by the physicians which caused the puerperal fever (10–35% mortality) and instituted hand washing with chlorinated lime solution, whereby the mortality dropped to less than 1%



Iatro-gerosis



Sample drug profile

-- Top of List --

	Senna	G	INPT	10	mL	Oral	QHSPRN*
	Mirtazapine rapid dissolving	G	INPT	60	MG	PO/NG	QHS
	ClonazePAM	G	INPT	0.25	MG	NG	QHS
	Lansoprazole	G	INPT	30	MG	NG	BID
	Venlafaxine	G	INPT	150	MG	NG	BID
	Metoclopramide	G	INPT	10	MG	PO/NG	AC
	Metoclopramide	G	INPT	10	MG	IV/SC	AC
	Acetaminophen	G	INPT	650	MG	Oral	Q4HPRN
	FLUoxetine	G	INPT	60	MG	Oral	QAM
	Docusate sodium	G	INPT	100	MG	Oral	BID
	Furosemide	G	INPT	40	MG	Oral	QAM
	Senna	G	INPT	5	mL	Oral	QAM+HS
	Multivitamins	G	INPT	5	mL	Oral	DAILY
	Tamsulosin sustained release (SR)	G	INPT	0.8	MG	Oral	DAILY
	Dabigatran	G	INPT	110	MG	Oral	QAM+HS
	Ramipril	G	INPT	2.5	MG	Oral	DAILY
	QUEtiapine	G	INPT	100	MG	Oral	QHS
	TraZODone	G	INPT	100	MG	Oral	QHS
	Colonic Lavage [PEG 3350, PegaLAX, LaxADay]	G	INPT	17	G	Oral	BIDPRN
	Lactulose	G	INPT	30	mL	Oral	QHS
	Atorvastatin	G	INPT	40	MG	Oral	QHS
	Fluticasone 125 mcg/dose	G	INPT	2	puff	Inhalation	BID
	Nitroglycerin 0.4 mg/spray	G	INPT	0.4	MG	Sublingual	Q5MINX3P
	Salbutamol	G	INPT	4	puff	Inhalation	QID
	OLANZapine 2.5 - 5 mg (5 mg RD tab) (ZyPREXA Zydis)	G	INPT	2.5 - 5	MG	Oral	TIDPRN
	Salbutamol	G	INPT	2	puff	Inhalation	Q4HPRN
	Loxapine 2.5 - 5 mg (50 mg/mL amp) (Loxapac)	G	INPT	2.5 - 5	MG	IM	Q4HPRN
	Loxapine 2.5 - 5 mg (2.5 mg tab) (1/2 x 5 mg) (Loxapac	G	INPT	2.5 - 5	MG	Oral	Q4HPRN
	Salmeterol [50 mcg/dose Diskus inhaler]	G	INPT	1	inh	Inhalation	QAM+HS
	Carvedilol	G	INPT	3.125	MG	Oral	QAM+HS
	Spironolactone	G	INPT	12.5	MG	Oral	QAM
	Tiotropium (inhalation)	G	INPT	18	MCG	Inhalation	QAM

-- End of List --

Common culprits – CONFUSION

- Drugs with high anti-cholinergic side-effects
  - Diphenhydramine [Benadryl]
  - Dimenhydrinate [Gravol]
  - Tricylic antidepressants (amitriptyline[Elavil])
  - Bladder anti-spasmodics (oxybutynin[Ditropan])
  - Antipsychotics (chlorpromazine[Largactil])

Common culprits – FALLS

- Falls-Risk Increasing Drugs (FRIDs)
  - Benzodiazepines (long half-life drugs are worse)
  - Opioid analgesics (*codeine*)
  - Anti-depressants (SSRIs are ***no better***)
  - Anti-psychotics (atypicals are ***no better***)
  - Ethanol (non-prescription)

Common culprits – WEIGHT LOSS

- Altered smell & taste
  - Metformin[Glucophage]
  - Antibiotics (metronidazole[Flagyl])
- Fluoxetine[Prozac]
- Donepezil[Aricept]

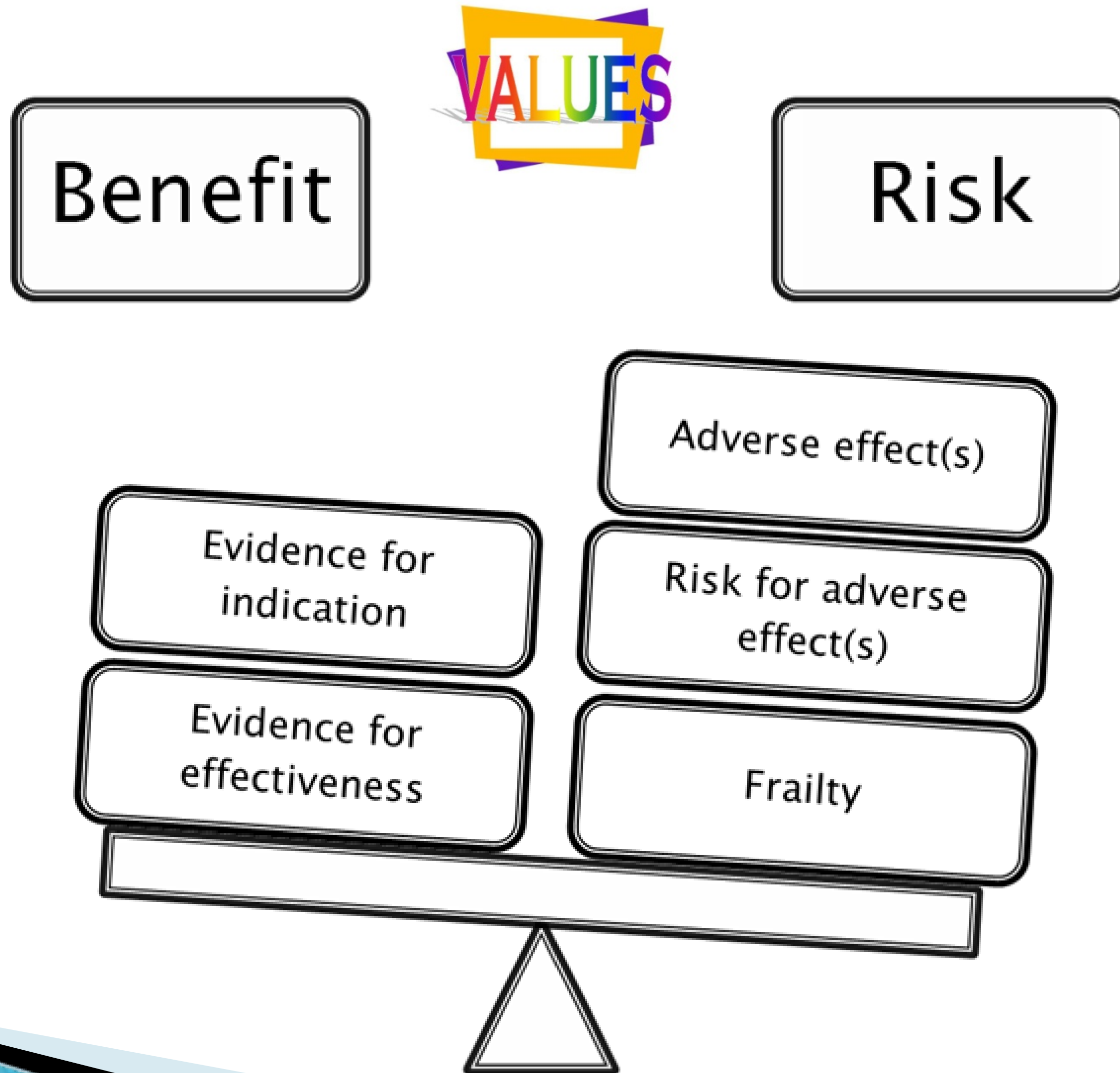
Common culprits – INCONTINENCE

- Diuretics (furosemide)
- Drugs with high anti-cholinergic side-effects
  - (diphenhydramine, amitriptyline)
- Bladder anti-spasmodics (oxybutynin)
- Donepezil
- Opioid analgesics (morphine)

- Recognize the need to reduce/taper or stop a medication
- Reduce/stop medications one at a time
- Consider if the medication can be stopped abruptly or if should be tapered
- Check for benefit or harm* during and after stopping each medication
  - *harm = adverse drug withdrawal events

A practical guide to stopping medicines in older people
http://www.bpac.org.nz/magazine/2010/april/stopGuide.asp

Making deprescribing decisions



Why it's hard to stop medications

- Physicians are often reluctant to stop medications in the elderly because of:
  - Clinical guidelines recommending prescribing
  - Lack of knowledge regarding how to deprescribe
  - Lack of knowledge regarding evidence for drug treatment targets in the elderly
  - Lack of confidence in deprescribing
  - Fear of stopping a drug started by someone else
  - Worry about 'something bad' happening to the patient
  - Lack of time for tapering, monitoring and follow-up

And, the complexity…

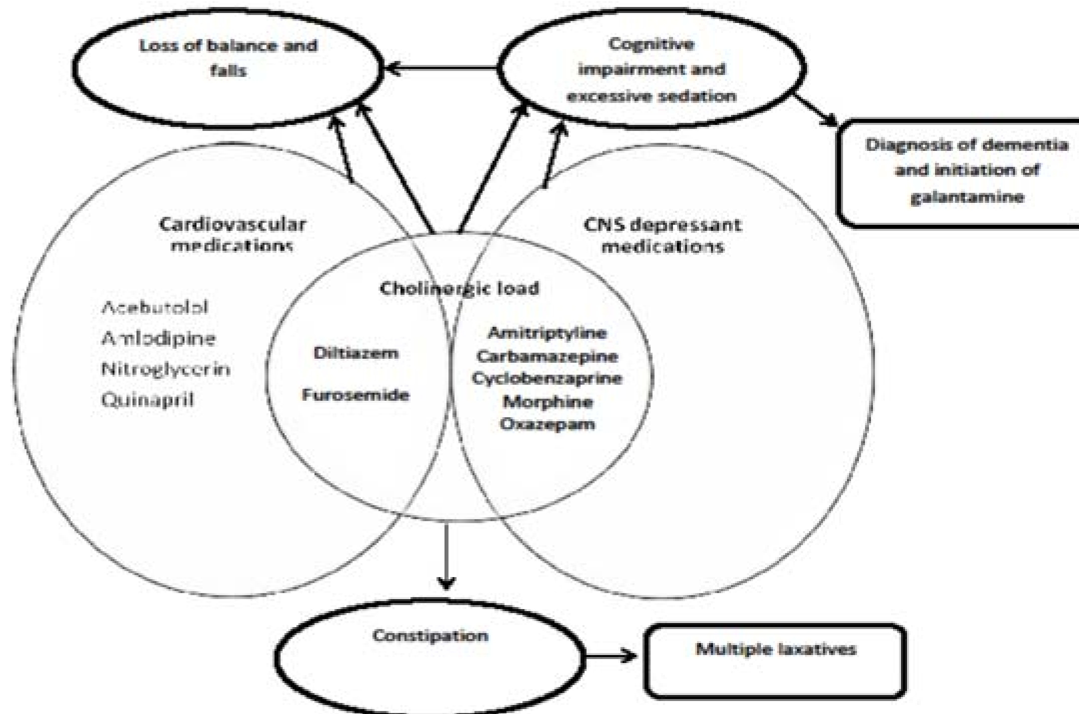


Figure 1. Additive effects of medications on sedation, cognition, constipation and fall risk.

Managing polypharmacy in a 77-year-old woman with multiple prescribers. CMAJ 2013;185:1240-1245.

General principles to decide if a drug is a culprit

- Pharmacological/physiological basis
- Known risk:
  - Check Beers criteria, STOPP criteria: https://www.ascp.com/articles/potentially-inappropriate-medications-elderly
- Timeframe (even if above not obvious)
- Symptom/syndrome
  - Improves with tapering or cessation
  - Reappears with restarting

Deciding if a drug is a culprit

- Confusion:
  - Beers criteria (section for drugs that may be problematic with cognitive impairment)
  - CNS depressants, H2RA, anticholinergics
    - Anticholinergic cognitive burden scale (Boustani et al):
    - https://www.health.harvard.edu/newsletters/Harvard_Health_Letter/2009/November/anticholinergic-cognitive-burden-scale
    - http://www.agingbraincare.org/tools/abc-anticholinergic-cognitive-burden-scale/
    - RxFiles (low, moderate, high) www.rxfiles.ca

Anticholinergic burden scale

Score 1		Score 2	Score 3	
Alprazolam	Disopyramide	Amantadine	Amitripyline	Meclizine
Atenolol	Fentanyl	Belladona	Amoxapine	Nortriptyline
Brompheniramine	Isosorbide	Carbamazepine	Benztropine	Olanzepine
Buproprion	Loperamide	Cyclobenzaprine	Chlorpheniramine	Orphenadrine
Captopril	Metoprolol	Cyproheptadine	Clemastine	Oxybutynin
Chlorthalidone	Morphine	Loxapine	Clomipramine	Paroxetine
Cimetidine	Nifedipine	Meperidine	Clozapine	Perphenazine
Clorazepate	Prednisone	Methotrimeprazine	Darifenacin	Procyclidine
Codeine	Quinidine	Molindone	Desipramine	Promethazine
Colchicine	Risperidone	Oxcarbazepine	Dicylcomine	Quetiapine
Diazepam	Theophylline	Pimozide	Dimenhydrinate	Scopolamine
Digoxin	Trazodone		Diphenhydramine	Thioridazine
Dipyridamole	Triamterene		Doxepin	Tolterodine
			Flavoxate	Triluoperazine
			Hydroxyzine	Trihexyphenidyl
			Imipramine	Trimipramine

Deciding if a drug is a culprit

- Falls
  - Beers criteria and STOPP criteria (sections with drugs known to affect those prone to falls)
  - Keep number of drugs in mind!
- Weight loss
  - No specific tools
- Incontinence
  - Beers criteria and STOPP criteria (sections with drugs known to affect those prone to incontinence)

- Antihypertensives (BBs, ACEIs, CCBs etc.)
- Nitrates
- Digoxin
- Diuretics
- PPIs, H2A
- Benzodiazepines (short)
- Antipsychotics
- Antidepressants
- Neuroleptics
- Anticholinergics
- Opiates

- Docusate
- Iron
- Calcium
- Vitamins
- Bisphosphonates
- Fibrates
- Glucosamine

Taper	OK to stop

Checking for benefit and harm

	What to monitor to look for benefit of deprescribing	Who can help
Confusion	MMSE? Clock? Trails?	
Falls	Falls, BBS	
Weight loss	Weight	
Incontinence	Bladder diary	

Monitoring for ADWEs

DRUG	MONITORING
ß-Blockers	↑ HR, ↑ BP, angina
Diuretics -furosemide -HCTZ	↑ pedal edema, chest sounds, SOBOE, ↑ weight
Hypnotics -lorazepam -zopiclone	poor sleep, ↑ anxiety, agitation, tremor
PPIs, Domperidone	Rebound heartburn, indigestion
Narcotics	↑ pain, ↑ PRN use, mobility changes, insomnia, anxiety, diarrhea

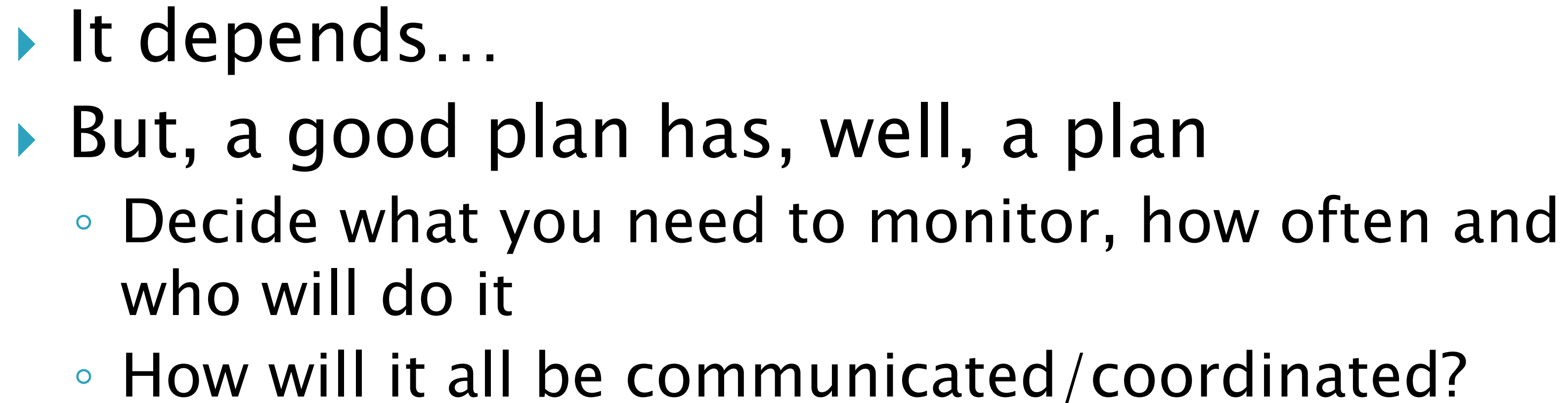
DRUG	MONITORING
NSAIDs	↑ pain, ↑ PRN use, mobility changes
Amlodipine	↑ BP
Gabapentin (for pain)	↑ pain, ↑ PRN use, mobility changes
Digoxin	palpitations, ↑ HR
Anti convulsants	anxiety depression seizures

Monitoring for ADWEs

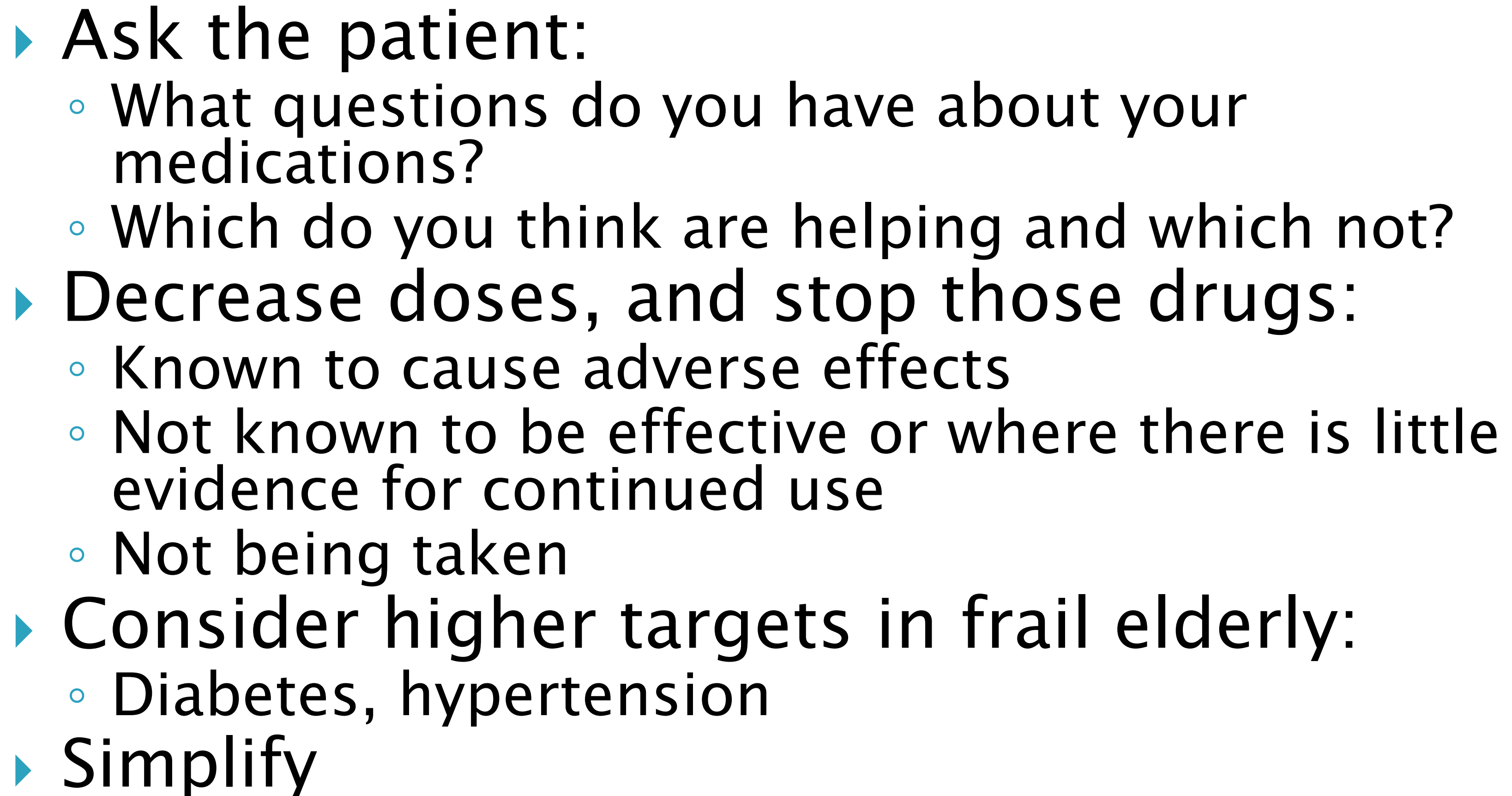
DRUG	MONITORING
Anti-depressants -citalopram -venlafaxine -mirtazapine -amitriptyline	Early: -chills, malaise -sweating -irritability -insomnia -headache Late: -depression recurrence
Nitro Patch	angina, ↑ BP
Steroids	anorexia, ↓ BP, nausea, weakness, ↓ blood sugars

DRUG	MONITORING
Baclofen	agitation, confusion, nightmares, ↑ spasms or rigidity
Anti-psychotics	-insomnia -restlessness -hallucinations -nausea

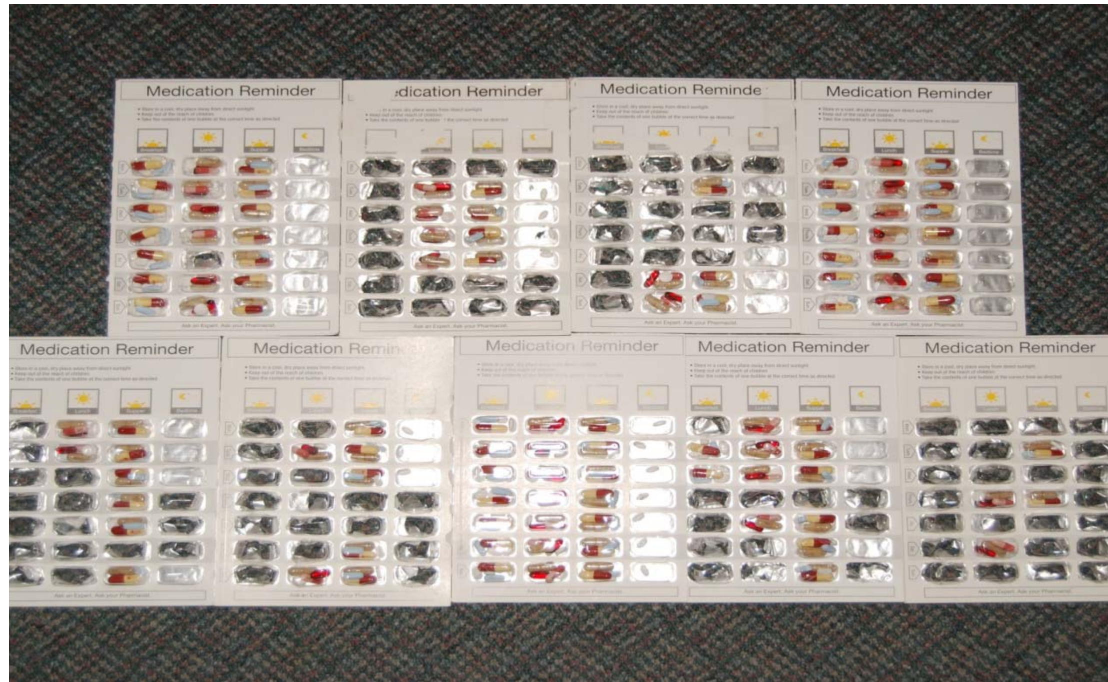
How frequently and for how long?



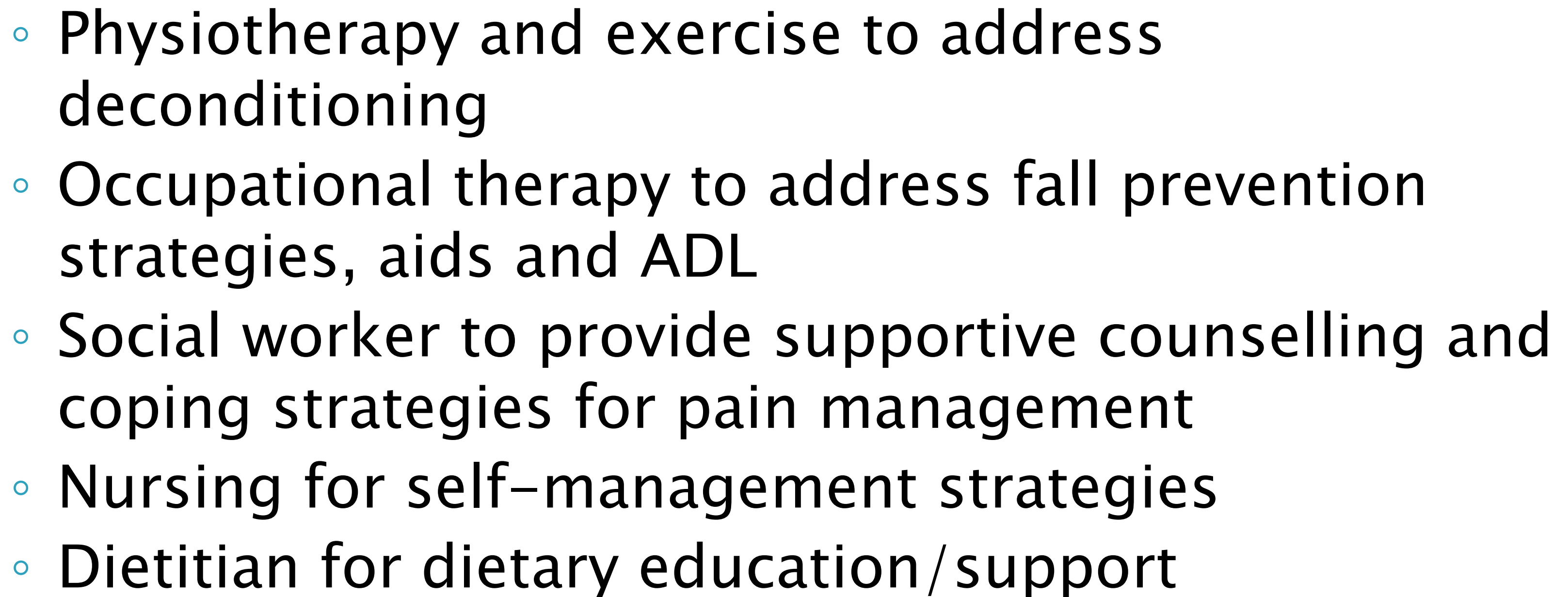
Where to start?



"Yes, I take all my medications…."



Involve others in avoiding medications



- Examples
  - Physiotherapy and exercise to address deconditioning
  - Occupational therapy to address fall prevention strategies, aids and ADL
  - Social worker to provide supportive counselling and coping strategies for pain management
  - Nursing for self-management strategies
  - Dietitian for dietary education/support

Deprescribing works when you:

- Prioritize medications for stopping:
  - Those causing side effects
  - Those not working
- Communicate clearly with patients and families about reasons and monitoring
- Work with the patient’s priorities and perspectives
- Educate and document
- Monitor the response (along with the patient)
- Restart the drug if needed (at lowest possible dose) or use a safer alternative

- Opportunities with community pharmacists
  - ‘Safety check’ at level of dispensing
    - Drug interactions
    - Dosing (provide creatinine if you want to get the most of this step!)
  - Consult (e.g. MedsCheck, Pharmaceutical Opinion)
    - Medscheck: primarily education (medication chart) with an on-site or home visit
    - Can help determine what patient is actually taking (compliance) and OTC, vitamin and herbal products
    - Pharmaceutical opinion can help with changes to therapy

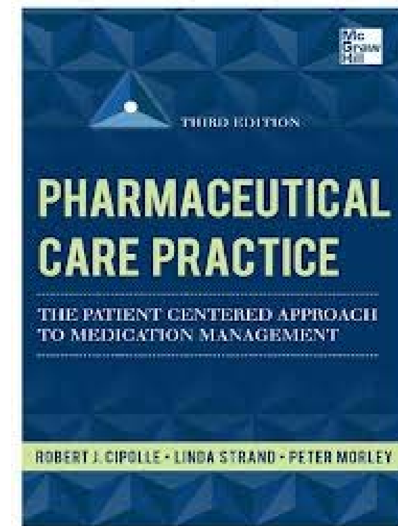
http://www.health.gov.on.ca/en/pro/programs/drugs/medscheck/medscheck_original.aspx

Collaborating with the pharmacist

- Other pharmacists (access to more patient information)
  - Family Health Team
  - Long-Term Care
  - Geriatric Day Hospital
  - Hospital
  - Emergency Room
  - CCAC
- Better ability to identify whether clinical outcomes achieved, existence of prescribing cascades, potential contribution to geriatric syndromes

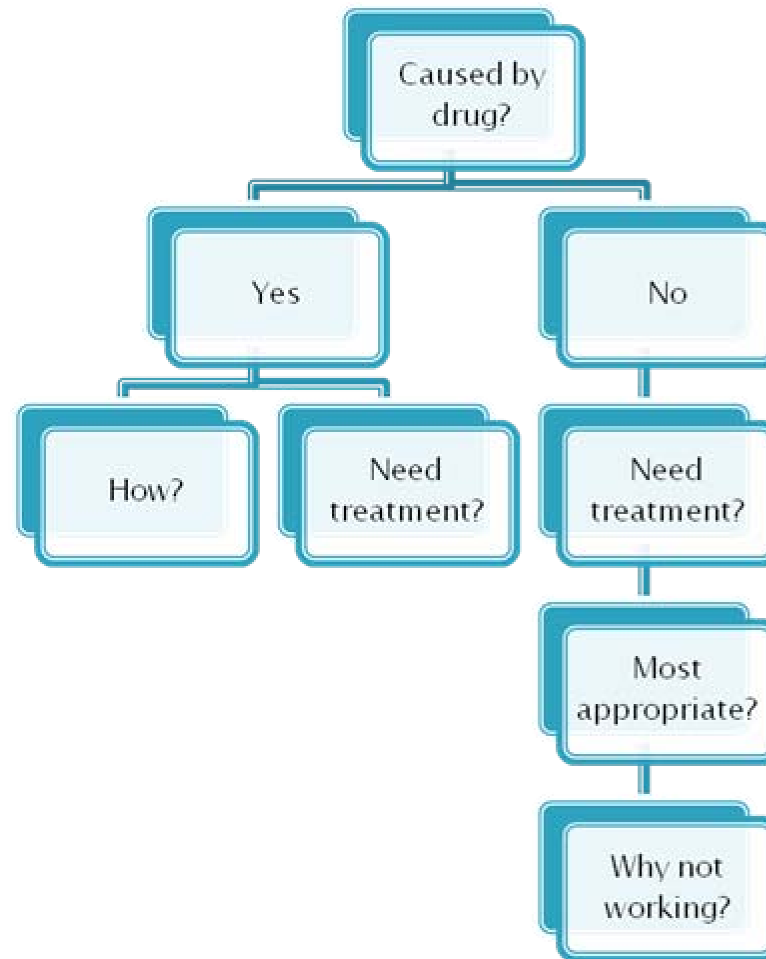
Pharmacist training

- Undergraduate (2+4)
  - Pharmaceutical care (indication, effectiveness, safety, compliance)
- Residency
- Certification programs
  - Specialty board certification (BPS)
  - Geriatrics
  - Certified Diabetes Educator
  - Patient Care Skills (ADAPT)



http://www.pharmacists.ca/index.cfm/education-practice-resources/professional-development/adapt/

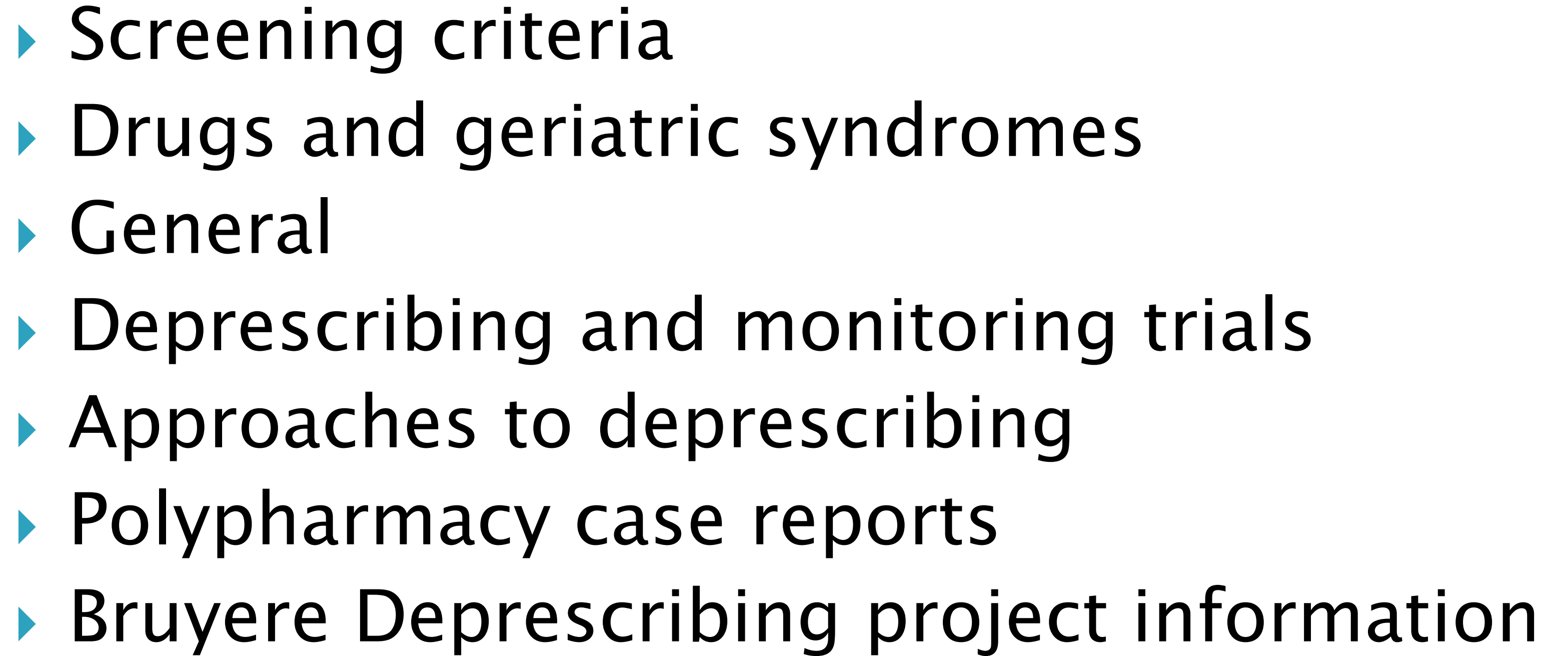
How pharmacists approach a problem



Collaborating with the pharmacist

- Pharmacists can help with:
  - Identifying potential contributors to geriatric syndromes
  - Advising when to taper vs. stop a medication
  - Switching medications
  - Monitoring and communicating outcomes of deprescribing
- The key is to find a pharmacist with the knowledge and skills to work alongside you in the process

References and resources



- Screening criteria
- Drugs and geriatric syndromes
- General
- Deprescribing and monitoring trials
- Approaches to deprescribing
- Polypharmacy case reports
- Bruyere Deprescribing project information

Screening criteria

- STOPP criteria: http://www.biomedcentral.com/imedia/3973756062468072/supp1.doc
- Beers' criteria: http://www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2012

Drugs and geriatric syndromes references

- Tannenbaum C, Paquette A, Hilmer S, et al. A systematic review of amnestic and non-amnestic mild cognitive impairment induced by anticholinergic, antihistamine, GABAergic and opioid drugs. Drugs Aging 2012;29(8):639-658.
- Huang A, Mallet L, Rochefort C, et al. Medication-related falls in the elderly – causative factors and preventive strategies. Drugs Aging 2012;29(5):359-376.
- Tsakiris P, Oelke M, Michel MC. Drug-induced urinary incontinence. Drugs Aging. 2008;25(7):541-9.
- Wierenga P, Buurman B, Parlevliet J, et al. Association between acute geriatric syndromes and medication-related hospital admissions. Drugs Aging 2012;29(8):691-699.

General references

- Optimizing medication use in elderly patients. Pharmacy Practice 2012;29(2):20.
- Qualitative insights into general practitioners' views on polypharmacy. BMC Family Practice 2010;11:65.
- Discontinuing benzodiazepine therapy: An interdisciplinary approach at a geriatric day hospital. Can Pharm Journal 2010;143:286.
- Qualitative insights into general practitioners' views on polypharmacy. BMC Family Practice 2010;11:65
- Spinewine A, Fialova D, Byrne S. The role of the pharmacist in optimizing pharmacotherapy in older people. Drugs Aging 2012;29(6):495-510.
- Huang A, Mallet L, Rochefort C, Eguale T, Buckeridge D, Tamblyn R. Medication-related falls in the elderly. Causative factors and preventative strategies. Drugs Aging 2012; 29:359.

Deprescribing + monitoring trials

- Iyer S, Naganathan V, McLachlan AJ, Le Couteur DG. Medication withdrawal trials in people aged 65 years and older: a systematic review. Drugs Aging 2008;25(12): 1021-31.
- Gnjidic D, Le Couteur DG, Kouladjian L, Hilmer SN. Deprescribing trials: methods to reduce polypharmacy and the impact on prescribing and clinical outcomes. Clin Geriatr Med 2012;28:237-253.
- Graves T, Hanlon JT, Schmader KE et al. Adverse events after discontinuing medications in elderly outpatients. Arch Intern Med 1997;157:2205-10.

Approaches to deprescribing

- Garfinkel D, Mangin D. Feasibility study of a systematic approach for discontinuation of multiple medications in older adults. Arch Intern Med. 2010;170(18):1648-54.
- Garfinkel D, Zur-Gil S, Ben-Israel J. The war against polypharmacy: a new cost-effective geriatric-palliative approach for improving drug therapy in disabled elderly people. IMAJ 2007;9:430-34.
- Hardy JE, Hilmer SN. Deprescribing in the last year of life. J Pharm Pract Res 2011;41:146-51.
- Best Practice Journal. A practical guide to stopping medicines in older people. Best Pract J 2010;27:10-23 – http://www.bpac.org.nz/BPJ/2010/April/stopguide.aspx

Polypharmacy case reports: Bruyere GDH

- Clinical vignettes to help you deprescribe medications in elderly patients: introduction to the polypharmacy case series. Canadian Family Physician 2013;59:1257-1258.
- Reducing fall risk while managing hypotension, pain and poor sleep in an 83 year old woman. Canadian Family Physician 2013;59:1300-1305.
- Can this be caused by a drug? Canadian Family Physician (in press).
- Turning over the rocks – the role of anticholinergics and benzodiazepines in cognitive decline and falls. Canadian Family Physician (in press)

Polypharmacy case reports: Bruyere GDH

- Reducing polypharmacy in the elderly: Cases to help you rock the boat. Canadian Pharmacists Journal 2013;146(5):243-244.
- Reducing pill burden and helping with medication awareness to improve adherence. Canadian Pharmacists Journal 2013;146(5):262-269.
- Reducing fall risk while managing pain and insomnia: addressing polypharmacy in an 81 year old woman. Canadian Pharmacists Journal 2013;146(6):335-341.
- Managing chronic disease in the frail elderly – more than just adhering to clinical guidelines. Canadian Pharmacists Journal 2014 147(2): (published online February 2014)

Polypharmacy case reports: Bruyere GDH

CMAJ·JAMC
Journal Home Page
Information for Authors
Medical knowledge that matters Des connaissances médicales d'envergure

- Managing polypharmacy in a 77-year-old woman with multiple prescribers. CMAJ 2013;185:1240-1245.
- Revisiting ongoing medication use in a frail 93 year old experiencing possible adverse effects. CMAJ published ahead of print October 21, 2013 doi:10.1503/cmaj.130523.

Other resources

- On wikipedia
  - Deprescribing
  - Polypharmacy
  - Prescription cascade
- Deprescribing guidelines
  - OPEN – Deprescribing guidelines for the elderly: http://www.open-pharmacy-research.ca/research-projects/emerging-services/deprescribing-guidelines
  - Funding: MOH Health Services Research Fund ($430,000)
  - Develop, implement and evaluate 3 deprescribing guidelines in LTC and FHT
  - Deprescribing@bruyere.org
  - @deprescribing

Thank you

Questions?

Contact:
Allen Huang – allenhuang@toh.on.ca
Barb Farrell – bfarrell@bruyere.org

Faculty/presenter disclosure

- Faculty: Barbara Farrell
- Relationships with commercial interests:
  - **Consulting Fees**: Canadian Pharmacists Association (ADAPT moderator)
  - **Other**: Employee of Bruyere Continuing Care
- Potential for conflict(s) of interest:
  - Barbara Farrell has received payment from the Canadian Pharmacists Association, whose online educational program, ADAPT, is discussed in this program. She acknowledges periodic involvement as a moderator in the ADAPT online education program for pharmacists