

Lecture:
Pharmacotherapy in the elderly

Pharmacist's role in providing pharmaceutical care to the elderly patients

Drug related problems in the elderly

Managing medications for elderly patients

15. 4. 2020

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Learning outcomes of today

- pharmacist's role in providing pharmaceutical care to elderly patients
- drug related problems in the elderly
- managing medications for elderly patients
- managing medications for elderly patients – practical training

Pharmacist's role in providing pharmaceutical care to the elderly patients

Drug related problems (DRP) in the elderly

- an event or circumstance involving drug therapy that actually or potentially interferes with desired health outcomes

- 2 reasons of high incidence of DRP in the elderly:
 1. elderly often take many drugs (**polypharmacy**)
 2. elderly have **age-related changes in pharmacodynamics and pharmacokinetics**
- adverse effects are preventable in majority cases in the elderly
- **nine preventable causes of DRP**

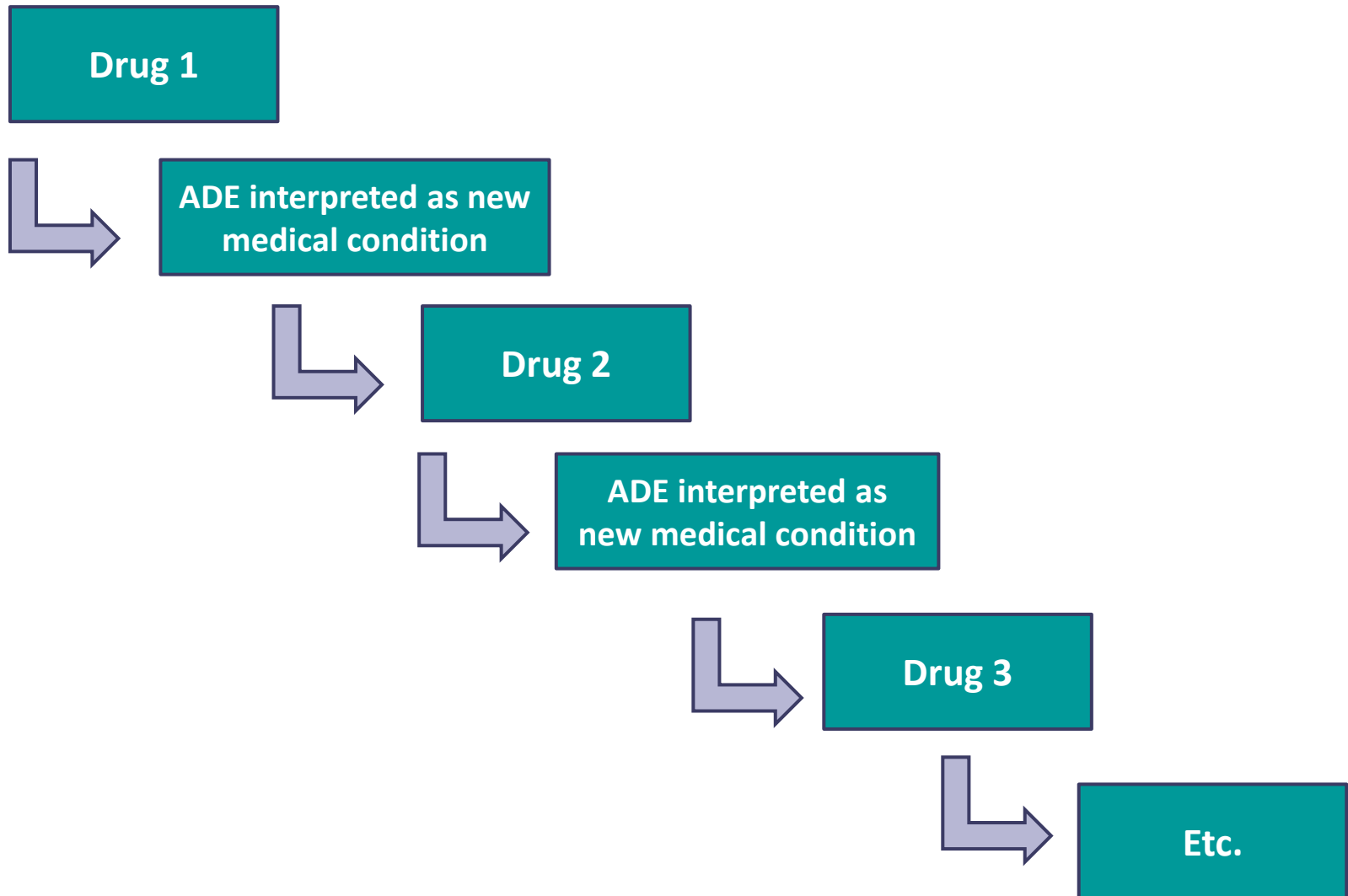
I. Drug interactions

- use of drug results in:
 1. drug-drug interaction
 2. drug-food interaction
 3. drug-food supplement interaction
 4. drug-disease interaction

Drug-disease interactions

- **drug given to treat one disease can exacerbate another disease**
- **Prescribing cascade:**
 - occurs when adverse effect (ADE) of drug is misinterpreted as symptom of new disorder and new drug is prescribed to treat it
 - new, unnecessary drug may cause additional adverse effects, which may then be misinterpreted as another disorder and treated unnecessarily

Prescribing cascade



Prescribing cascade - examples

Initial treatment	Adverse effect	Subsequent treatment	Subsequent adverse effect
NSAIDs	Rise in blood pressure	Antihypertensive treatment	Orthostatic hypotension
Thiazide diuretics	Hyperuricaemia	Allopurinol	Hypersensitivity reaction (skin rashes)
Metoclopramide	Parkinsonian syndroms	Levodopa	Visual and auditory hallucination
Amlodipine	Ankle edema	Furosemide	Hypokalemia, hyponatremia

Drug-drug interactions

- drug-drug interactions in the elderly differ little from those in the general population:
- **induction** of cytochrome P-450 (CYP450) drug metabolism:
 - may be **decreased** in the elderly
 - change (increase) in drug metabolism may be less pronounced in the elderly
 - e.g. phenytoin, carbamazepine, rifampicin
- **inhibition** of cytochrome P-450 (CYP450) drug metabolism :
 - **the same** as in general population

II. Inadequate monitoring

- medical problem is being treated with correct drug, but **patient is not adequately monitored for complications, effectiveness, or both**

Documenting of:

- the indication for a new drug
- keeping a current list of drugs used by the patient in medical records
- monitoring for achievement of therapeutic goals
- monitoring necessary laboratory tests
- periodically reviewing drugs

III. Inappropriate drug selection

- drug is **inappropriate if its potential for harm**
- harm is greater than its potential for benefit



choice of an
unsuitable
drug
incorrect
indications
for a drug



choice of
dose



choice of
frequency of
dosing



choice of
duration of
therapy



duplication
of therapy



drug
interactions



The Beers Criteria

- American Geriatrics Society 2015 Updated **Beers Criteria** for *Potentially Inappropriate Medication Use in Older Adults*
- provides a list of drugs, according to their class, which could be potentially harmful to the elderly
- similar to Beers criteria exists in Canada - list of **McLeods' criteria**
- eight European countries: multicentric european **AdHOC study**
(Aged in H0me Care)

The Beers Criteria

- some of the bigger categories of drugs that generally should be avoided in the elderly:

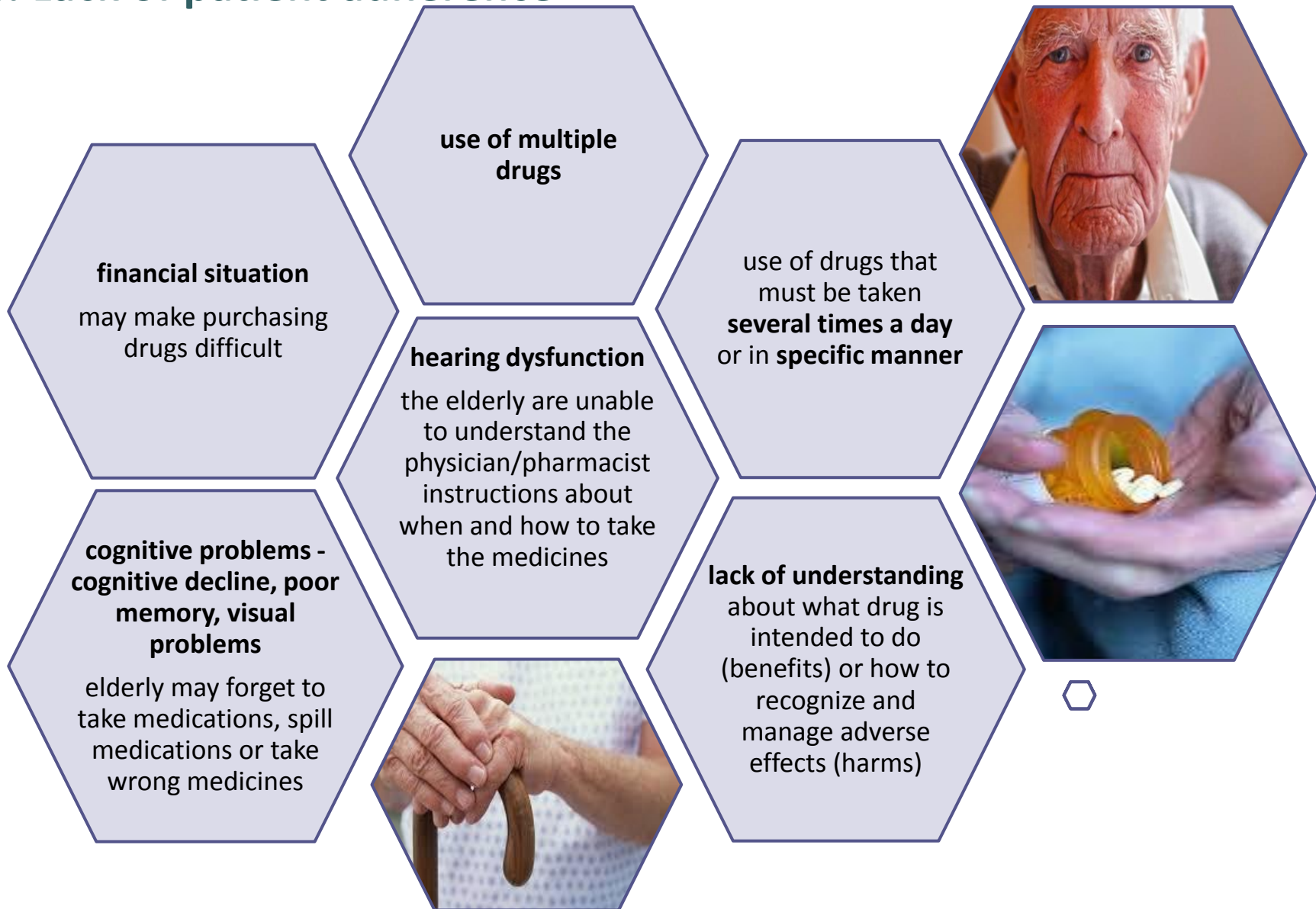
- Antihistamines, drugs that block acetylcholine (e.g. diphenhydramine)
- Antiparkinson drugs
- Antispasmodics (e.g. dicyclomine)
- Some drugs to treat blood clots (e.g. ticlopidine)
- Nitrofurantoin
- Alpha-1 blockers (e.g. terazocin)
- Alpha-agonists (e.g. reserpine)
- Some drugs used to treat heart arrhythmias (e.g. amiodarone)
- Digoxin when used at high doses to treat heart failure

- Older antidepressants called “tricyclics”
- Antipsychotics, both older drugs (e.g. haloperidol) and the newer ones (e.g. risperidone)
- Barbiturates like phenobarbital, an old group of drugs
- The sedative class called the “benzos” like diazepam (Valium)
- The “non-benzo” sleeping drugs such as zolpidem
- Hormones such as testosterone, “desiccated” thyroid, estrogens like Premarin (conjugated estrogens)
- The narcotic meperidine
- Almost all non-steroidal anti-inflammatory drugs (NSAIDs) (e.g. ibuprofen)
- Muscle relaxants like methocarbamol

IV. Inappropriate treatment

- patient is **taking drug for no medically valid reason**

V. Lack of patient adherence



VI. Overdosage

- medical problem is being treated with **too much of the correct drug**
- reasons of overdosage:
 - **renal or hepatic impairment**
 - **drug-drug interactions**
 - **duplication of a drug**
 - therapeutic duplication
- drugs should be started at the lowest dose in the elderly

VII. Poor communication

- **drugs are inappropriately continued** or **stopped** when care is transitioned between providers (physicians) and health care facilities
 - poor communication of medical information (from one health care setting to another)

IIIX. Underprescribing

- a medical problem is being treated with **too little of the correct drug**
- drugs that are often underprescribed in the elderly:
 - depression
 - Alzheimer disease
 - pain (eg. opioids)
 - heart failure
 - post-MI (β -blockers)
 - atrial fibrillation (warfarin)
 - hypertension
 - glaucoma
 - incontinence
 - immunizations

IX. Untreated medical problem

- medical problem requires drug therapy, but **no drug is being used to treat that problem**

How to prevent DRP in the elderly?

Before starting a new drug

- Consider **nondrug treatment**
- Discuss **goals of care** with the patient
- **Document** the indication for each new drug
- Consider **age-related changes in pharmacokinetics or pharmacodynamics**
- Choose the **safest possible alternative**
- Check for potential **drug-disease** and **drug-drug interactions**
- Start with a **low dose**

- Use the **fewest drugs necessary**
- Note **coexisting disorders** and their contribution to adverse drug effects
- **Explain** the uses and adverse effects of each drug
- Provide **clear instructions** to patients about how to take their drugs
- Anticipate confusion due to **sound-alike drug names**

After starting a drug

- Assume a **new symptom** may be drug-related until proved otherwise
- Monitor **patients for signs of adverse drug effects**, including measuring **drug levels**
- Document the **response to therapy**
- **Reevaluate the need to continue drug therapy**

How to manage medications for elderly patients?

Managing medications for elderly patients

- Use a medication organizer

Single slots for each day



Morning and night slots (from two to four slots a day)



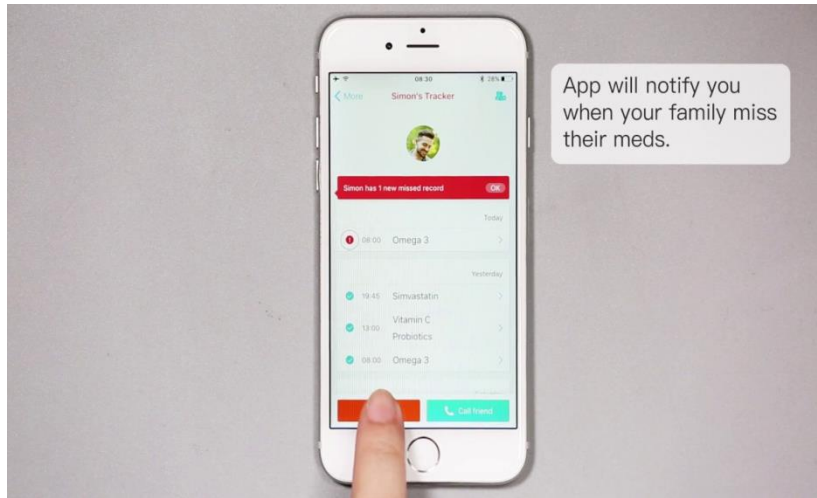
Reizen Vibrating Five Alarm Pill Box



Pill Box Organizer with Water Bottle



Smart PillBox Memo Box



<https://www.youtube.com/watch?v=OOdpXpBf8E4>

Managing medications for elderly patients

- Make a list of all medication

- make a full list of all medications, including:
 - prescription drugs
 - over the counter drugs
 - food supplements

Medication List

Name of Medication	Strength of Medication	Description of Medication	How Many to Take at Each Dose	How to Take the Medication	Special Instructions	What is the medication for?	Who Prescribed the Medication?
Generic: Levothyroxine Brand: Synthroid	112 mcg	Pink oblong tablet	1	1 tablet by mouth every day	Take in the morning on an empty stomach	Thyroid	Dr. Smith

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Managing medications for elderly patients

- Ask questions

What the side effects are of the medications?

What side effects can the patient experience due to interaction among medications?

Are there certain foods or supplements that can interact with the patient's prescribed medications?