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What do we need to consider to ensure medication adherence of older adults

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The Road map to drug therapy

Road map to drug therapy

Stage I: From health issue to drug

1. Experience a health symptom
2. Decides to visit a physician
3. Visit one or more physician's
4. Examination by the physician
5. Information by the physician on disease
6. Receipt of a prescription
7. Decision to execute the prescription
8. Goes to the pharmacy
9. Receipt of (other) information about the medication
10. Exchange the prescription with one or more drug products

Stage II: From drug to adherence

1. Return home with the drug product(s)
2. Receipt of further information through internet and relatives
3. Understand the therapy and proceedings
4. Development of a therapeutic management schedule
5. Establish a therapeutic implementation plan
6. Follow the therapeutic schedule on time
7. Access and take out the medication of primary packaging
8. Pick up the medication and administer
9. Judge the therapeutic effect & ADRs of the medication
10. Decide to continue medication or re-schedule
11. Decide to visit the physician again

Road map to drug therapy

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Adherence is the result of
the entire therapeutic process

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Adherence measurement systems (AMS)

Definition of adherence & concordance

- Adherence is the degree to which patient behaviors coincide with the healthcare providers and patients jointly agreed healthcare objectives and respective therapeutic regimen.
- Concordance is decision about the drug therapy that is commonly agreed between the physician and the patient after negotiations that respect the patients own wishes and beliefs.

Haynes et al Compliance in healthcare (1979); Cushing & Metcalfe Ther Clin Risk Mgt 2007

Adherence Measurement Systems (AMS)

Objectives

- Understand patients medication behavior, difficulties & issues
- Provide supportive interventions to resolve medication problems

Requirement

- Usability and applicability by the patient
- Validity, Reliability and objectiveness
- Continuous recording over prescription period (persistence)
- Decent/non obtrusive – non-invasive and acceptable by older patients and their care givers
- Ease of record, analyze and feedback (decision support)
- Ability to measure multiple products simultaneously (polypharmacy)
- Allow corrective interventions in real time
- Cost effective
- Sustainability and generalizability
- Interoperability with pre-existing systems

Adherence Measurement Systems (AMS)

Direct Measurements	
Drug Monitoring	<ul style="list-style-type: none">➤ Clinical monitoring of drug in biologic fluids➤ Biological marker given with drug (e.g. riboflavine)➤ PD and response monitoring
Response Monitoring	<ul style="list-style-type: none">➤ Clinical response evaluation
Drug Application Measurement	<ul style="list-style-type: none">➤ Direct observed therapy (DOT)

Adherence Measurement Systems (AMS)

Indirect Measurements	
Pharmaceutical Data base	<ul style="list-style-type: none"> ➤ Medication filling and re-filling (Pharmacy refill rates) ➤ Pill-counts (home or pharmacy based) ➤ Medication possession ratio (MPR) ➤ Cumulative Medication Gap (CMG)
Automated detection with or without alert systems	<ul style="list-style-type: none"> ➤ Medication Event Monitoring System (MEMS™) & eCaps™ ➤ Objective therapy compliance measurement (OtCM, DDSi™ smart blister) ➤ Multiple drug monitoring (Med-eMonitor™, Medsignals™)
Telemonitoring with or without alert systems	<ul style="list-style-type: none"> ➤ Record & report clinical data ➤ Dosage form photograph (Galloway) ➤ Reminder & alert (e.g. via SMS or signal) ➤ “Chip in the pill” technology (Proteus™, Smart Pill™)

Adherence Measurement Systems (AMS)

Indirect Measurements	
In-Person measurement (self-reported adherence)	<ul style="list-style-type: none"> ➤ Self-reported Questionnaire (SRQ) e.g. Morisky scale ➤ Brief medication questionnaire (BMQ) ➤ Medication adherence survey (MAS) ➤ Medication Outcome study (MOS) ➤ Face-to-face interview ➤ Patient-kept diary ➤ Audio computer-assisted self interview (ACASI) ➤ Interactive Voice Response (IVR) ➤ Medication (Pill) Identification Test (MIT, PIT) ➤ Visual Analogue Scale (VAS) ➤ Medication Management Instrument for Deficiencies in the Elderly (MedMaIDE)
Alert & Reminder Systems	<ul style="list-style-type: none"> ➤ Context aware reminder system [Hayes] ➤ Pill timer with or without connectivity (e.g. Glowcaps™) ➤ Pill timer with remote dose prescription

Adherence Measurement Systems (AMS)

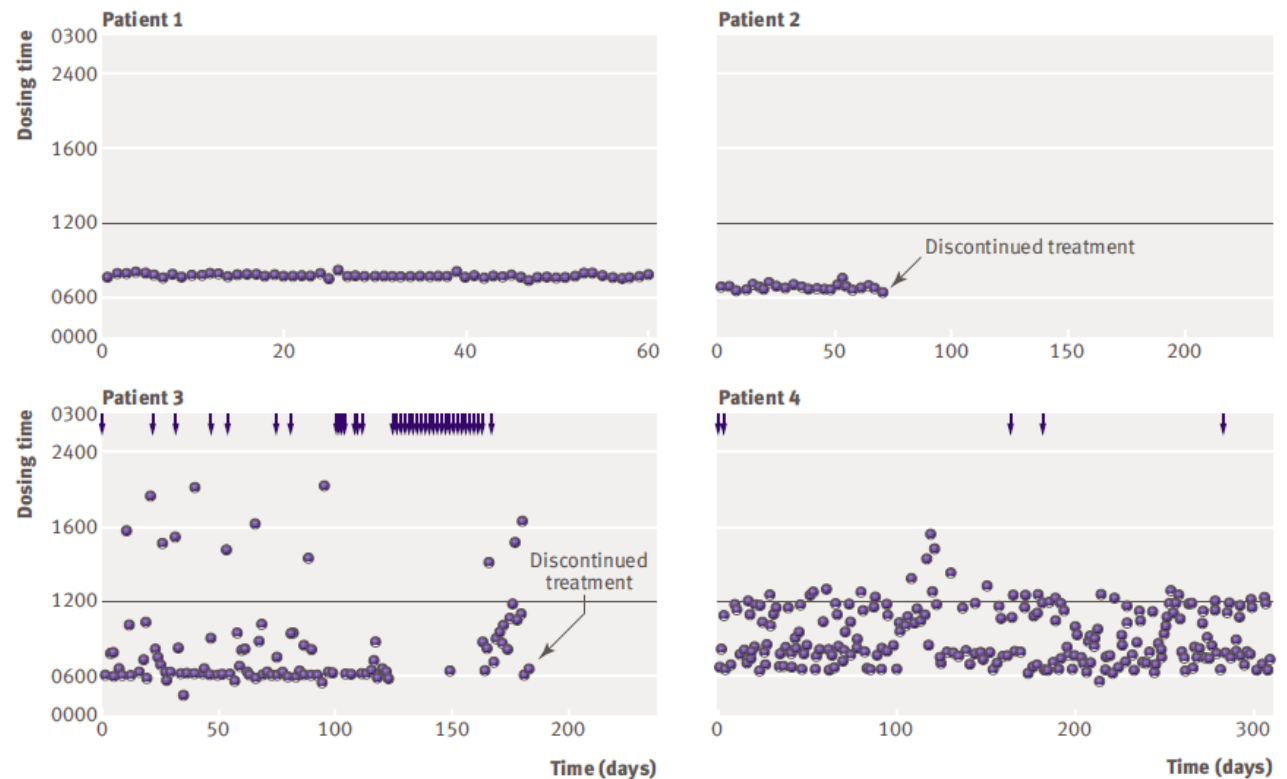
- All AMS have strengths and weaknesses and none is ideal or could be considered as a golden standard
- The existing AMS are sensitive to manipulation and intended misuse by patients
- Some AMS require technology that should be considered carefully for their appropriateness in older adults

Adherence Patterns

Adherence patterns

Typologies of patients

1. nearly adherent
2. mainly adherent with some irregular timing
3. occasionally missing dose and irregular timing
4. some drug holiday periods
5. more often drug holidays and dose omissions
6. take the drug only very few times or never (non-persistent)



Reasons for adherence problems

Reasons for adherence problems

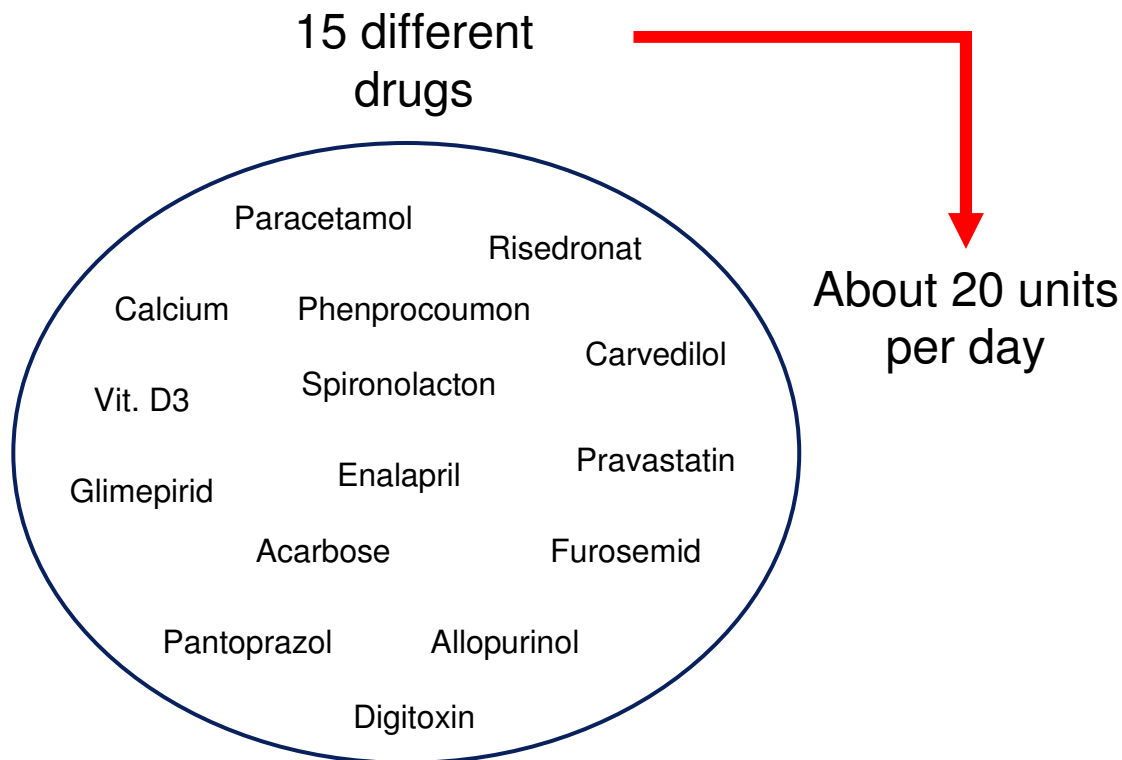
- Reasons are across different areas
 - ✓ Social and economic factors
 - ✓ Health care team and system-related factors
 - ✓ Condition-related factors
 - ✓ Therapy-related factors
 - ✓ Patient-related factors

- Focus on three exemplary areas
 - ✓ Therapy related factors: Therapeutic complexity
 - ✓ Condition-related factors: Inability to apply the medication – swallowing problems
 - ✓ Condition-related factors: Inability to apply the medication – packaging

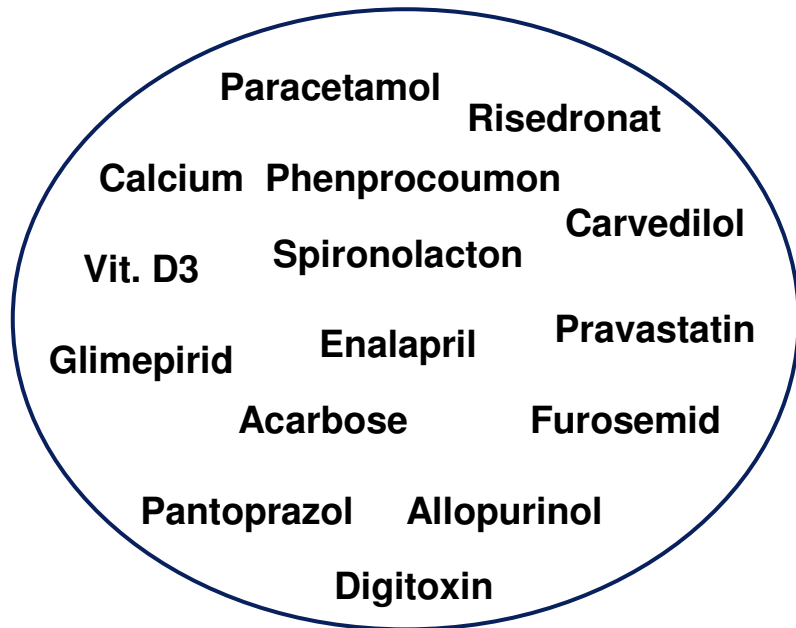
Reasons for adherence problems

Example: 85 year old patient

With hip fracture, osteoporosis, heart failure, auricular fibrillation, diabetes, hypercholesterinemia, hyperurikemia, inkontinence



Therapy-related factors: Therapeutic complexity



Physicians involved

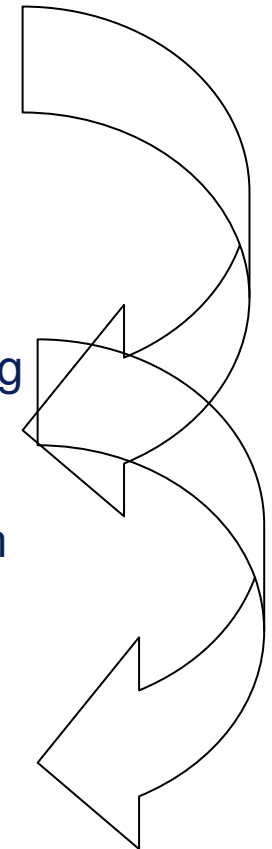
- Orthopedist
- Cardiologist
- Internist
- General Practitioner

Medication schedule

- Morning & noon & evening
- Before & after meal
- 1x & 2x & 3x a day
- Remember all information

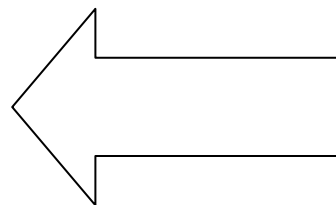
Medication preparation

- Identification
- Release from packaging
- Re-identification
- Preparing for use (according to the specific schedule)



Medication management

- Right product
- Right dose
- Right time
- Right administration



Condition-related factors: Swallowing issues

- Frequency of medication swallowing issues
 - ✓ in 410 independently living older adults
 - ✓ Results:
 - ❖ *22.4 % reported swallowing disorders*
 - ❖ *63 % were related to large size and 14 % to surface (rough and sticky coating)*
 - ❖ *37.5 % resulted in non-adherence*

- Impact of dysphagia on oral medication
 - ✓ 792 interview (by pharmacist), 675 patients and 117 carers with expected swallowing issues
 - ✓ 90 % were 60 – 89 years (41 % were 70 – 79 years)
 - ✓ Results:
 - ❖ *60 % (477) reported difficulties swallowing*
 - ❖ *Of these 68 % crushed the tablet or opened the capsule*
 - ❖ *69 % omitted the drug*

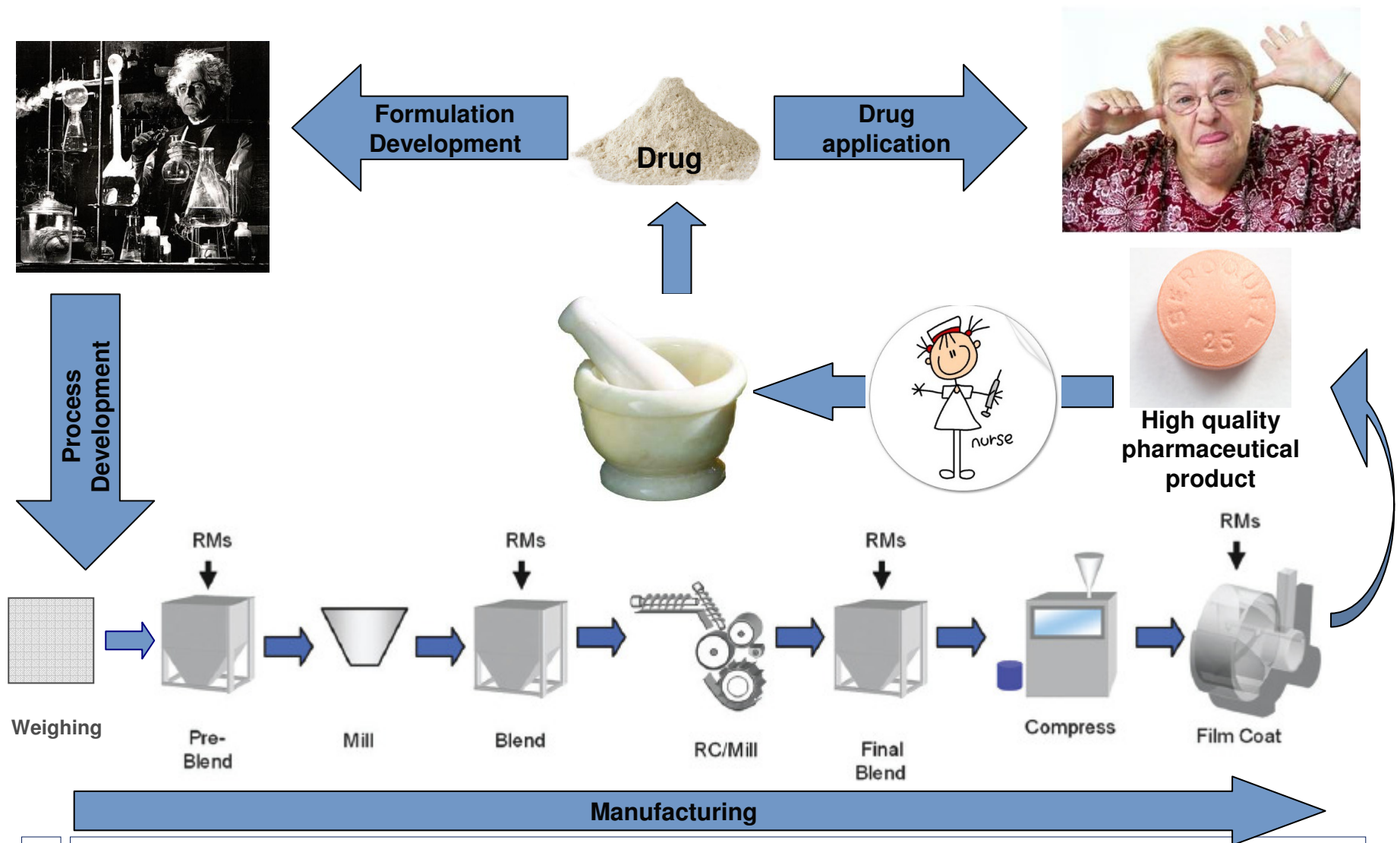
Condition-related factors: Swallowing issues

- Nurse and care givers in nursing homes
 - ✓ Crushing and opening takes place in 80 % nursing homes on a weekly basis (Wright D, Nursing Standard 16(42) 33-38 (2002))
 - ✓ 23 % of nursing home patients get drugs mixed in food/beverages and 10 % were given at least one inappropriate altered medicine (Kirkevold & Engedal Int J Nursing Pract 16, 81-85 (2010))
 - ✓ At least one medication was altered in 34 % of patients, 17 % received inappropriate altered medication. In 59 % of cases everything was crushed in one vessel and spillage occurred in 70 % (Paradiso et al Austr J Ageing 21(3) 123-127 (2002))



Internet search identified
66 different devices offered !

“Close loop drug product supply”



Condition-related factors: Packaging issues

- 120 elderly patients admitted consecutively to an acute teaching hospital geriatric service due to medication issues
- The patient were assessed for their ability to open standard medication packages and remove tablets.

Container/task	Unable to open/per- form (number of patients)	Percent unable to open/perform
Screw top	10	8.3
Flip top	17	14.2
Blister pack	25	20.8
“Dosett”	29	24.2
Foil wrap	36	30.0
Child-proof	68	56.6
Break tablet	87	72.5

[..\..\Video\Blister.AVI](#)

[..\..\Video\Tablet splitting.AVI](#)

Essentials for adherence

- Provision of all information about the reason and need for the therapy to the patient including potential ADRs
- Support to establish/simplify the medication schedule including an implementation intention and contextual cues*
- Ability to access the medicine and use the medicine without alteration
- Provision of supportive devices like pill organizers or reminder systems
- Development and prescription of appropriate pharmaceutical products

Specific considerations for older people

Adherence in older patients

- Medication reviews and therapeutic adjustments according to
 - ✓ Age
 - ✓ Morbidities and Co-morbidities
 - ✓ Co-medications (including OTC)
 - ✓ Therapeutic objectives and patients wishes
 - ✓ Level of patients reserves
- Perceived and real level of complexity of a treatment schedule
- Patients ability to manage and administer the medication
 - ✓ Mobility
 - ✓ Cognition
 - ✓ Visual
 - ✓ Auditory
 - ✓ Hand motoric functions
- Available level of support, social involvement and psychological status (fears of loosing independence)



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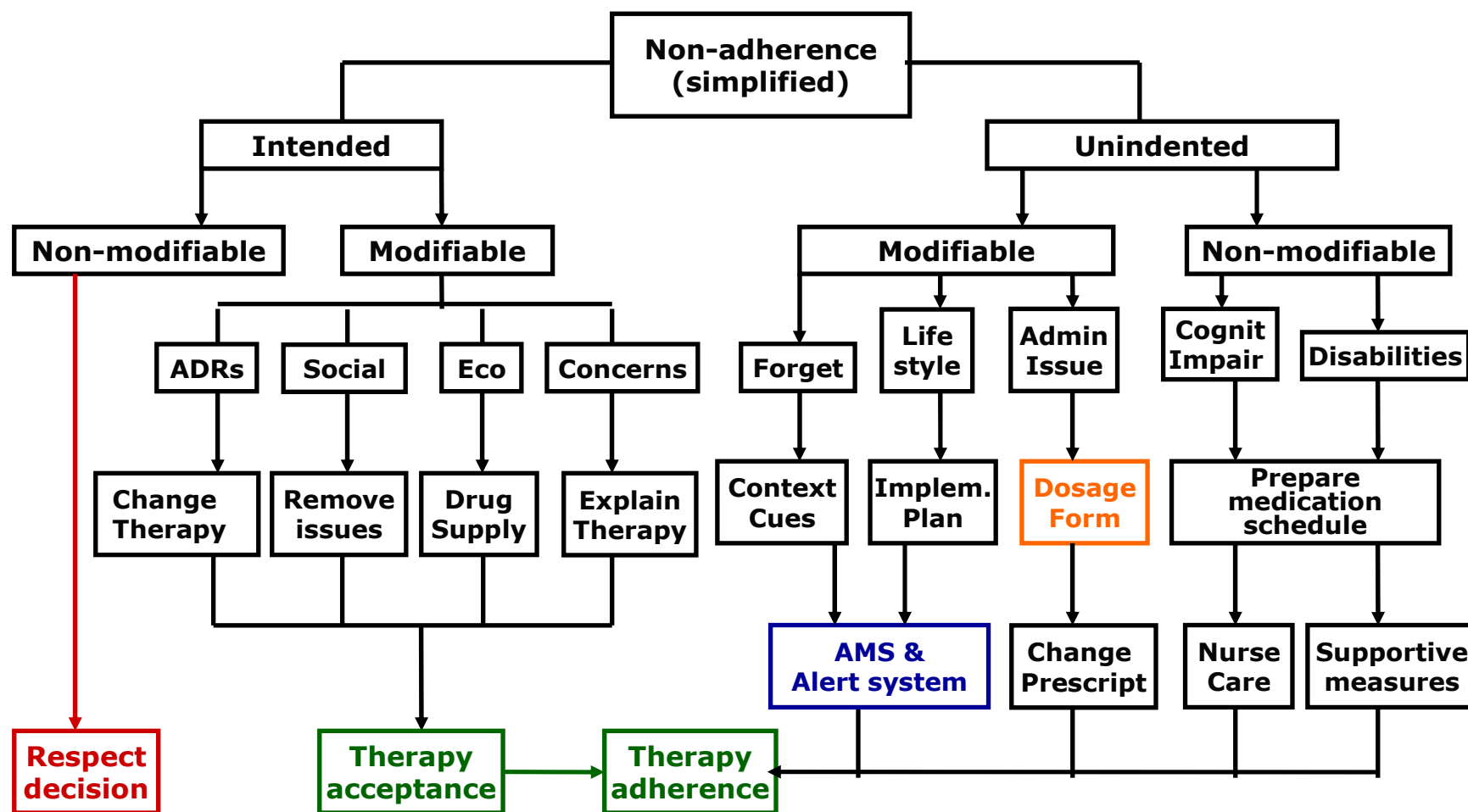


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Conclusion

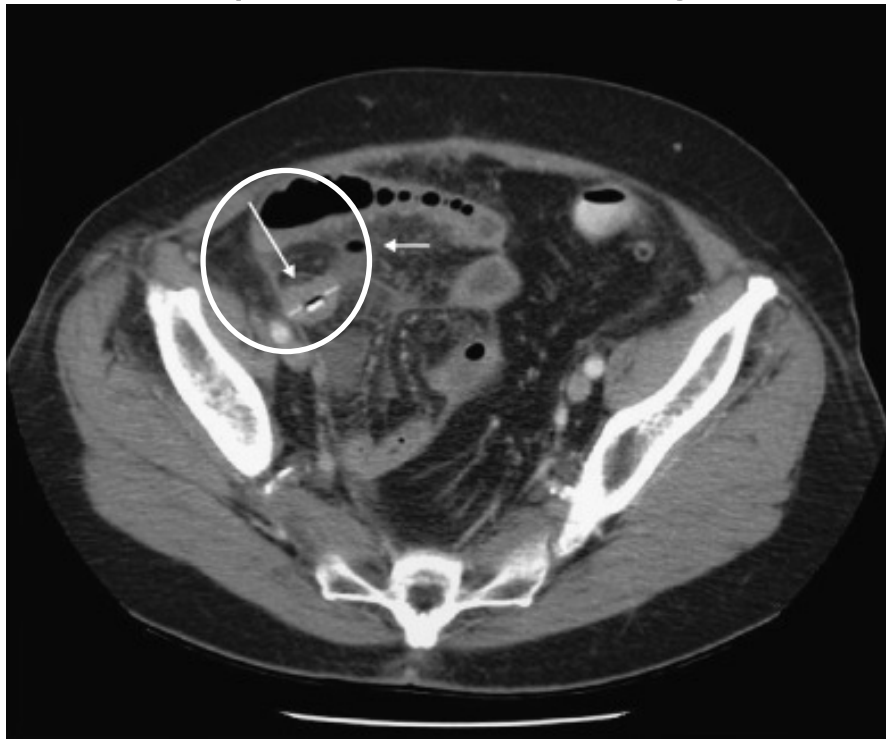
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Conclusions



Conclusion

- We should not assume that we “know” what a patient knows
- We should not assume that the patient “knows”, what we know
- We should not assume that the drug is all the patient needs
- We should not assume that the patient is not willing to be adherent

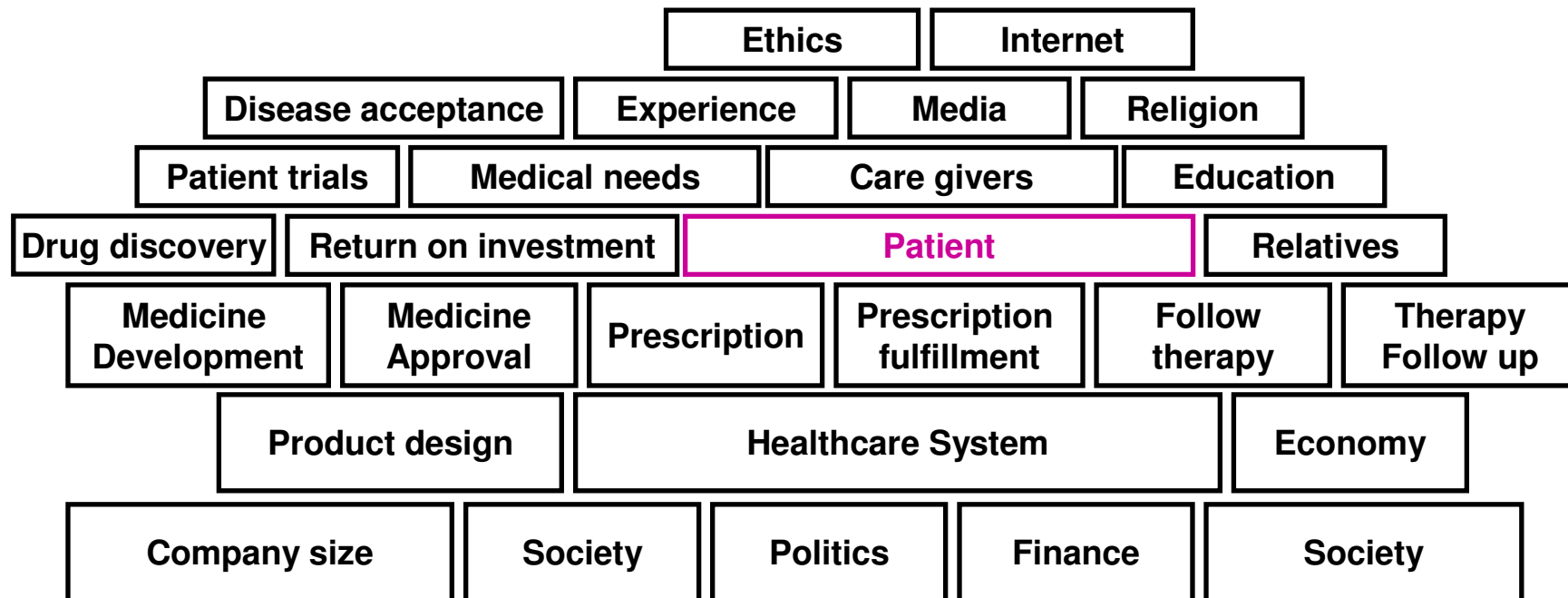


Conclusion

- ...and we should not assume that adherence works top-down



Conclusion



Thank you!



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