

Drug therapy problems in older patients – current situation and future trends in primary care

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Outline

- 1. What are the problems?**
→ Case example
- 2. What are root causes/targets for intervention?**
→ Problem analysis
- 3. What have we learned so far?**
→ Previously tested interventions
- 4. How can pharmacists best contribute?**
→ Outlook

Outline

1. What are the problems?

→ Case example and problem analysis



CASE EXAMPLE



- Mr C is an 85 year old man
- Previous actor and golf player

CASE EXAMPLE



• Medical History:

1. Hypertension
2. Diabetes Type 2
3. Coronary heart disease
4. Atrial fibrillation
5. Renal impairment (eGFR 42 ml/min)
6. Gastroesophageal reflux disease
7. Chronic back pain

CASE EXAMPLE



• Drug History

1. Metformin 500mg 1-0-1-0
2. Glimepirid 4mg 1-0-0-0
3. Aspirin 75mg 1-0-0-0
4. Atorvastatin 20mg 1-0-0-0
5. Warfarin (INR 2.0 – 3.0)
6. Metoprolol 25mg 1-0-1-0
7. Furosemide 20mg 1-0-0-0
8. Ramipril 1-0-0-0
9. Gabapentin 300mg 1-0-1-0
10. Mirtazapin 15mg 0-0-0-1
11. Ferrous sulphate 1-0-0-0
12. Ibuprofen 400mg as required
13. Lactulose as required

CASE EXAMPLE

**Presentation:**

- Short of breath
- Needs to sit in a chair to sleep
- Has gained 3kg over previous 7 days

CASE EXAMPLE



- GP increases furosemide dose to 40 mg/day and refers patient to cardiologist.
- Cardiologist diagnoses LVSD and initiates spironolactone 25mg.

CASE EXAMPLE



• New medication profile

1. Metformin 1-0-1-0
2. Glimepirid 4mg 1-0-0-0
3. Aspirin 75mg 1-0-0-0
4. Atorvastatin 20mg 1-0-0-0
5. Warfarin (INR 2.0 – 3.0)
6. Metoprolol 25mg 1-0-1-0
7. **Furosemide 40mg 1-0-0-0**
8. Ramipril 1-0-0-0
9. Gabapentin 300mg 1-0-1-0
10. Mirtazapin 15mg 0-0-0-1
11. Ferrous sulphate 1-0-0-0
12. Ibuprofen 400mg as required
13. Lactulose (bei Bedarf)
14. **Spironolactone 25mg 1-0-0-0**

CASE EXAMPLE



• What went wrong?

CASE EXAMPLE



- **What went wrong?**

- ✓ **Decision to intensify treatment for heart failure sensible, but ...**

CASE EXAMPLE



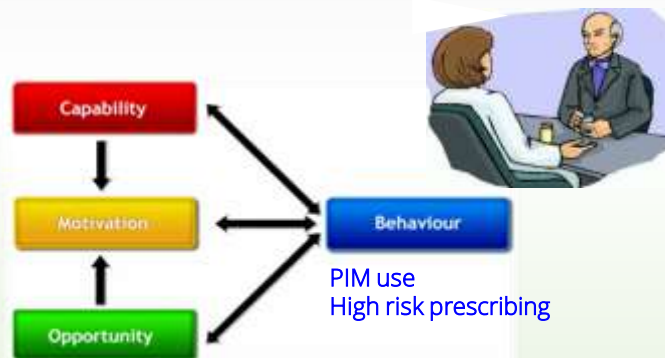
- **.... what about these?**

1. Metformin 1-0-1-0
 2. Glimepirid 4mg 1-0-0-0
 3. Aspirin 75mg 1-0-0-0
 4. Warfarin (INR 2.0 – 3.0)
 5. Metoprolol 25mg 1-0-1-0
 6. **Furosemide 40mg 1-0-0-0**
 7. Ramipril 1-0-0-0
 8. Gabapentin 300mg 1-0-1-0
 9. Mirtazapin 15mg 0-0-0-1
 10. Ferrous sulphate 1-0-0-0
 11. Ibuprofen 400mg as required
 12. Lactulose as required
 13. **Spirolactone 25mg 1-0-0-0**
- Ongoing need?
 - Risk of bleeding
 - Risk of bleeding
 - Risk of AKI
 - Risk of AKI
 - Indication?/ Risk of falls
 - Indication?/ Risk of falls
 - Ongoing need?
 - Risk of bleeding/Risk of AKI
 - Ongoing need?

Outline

1. What are the problems?
→ Case example and problem analysis
2. What are root causes/targets for intervention?
→ Problem analysis

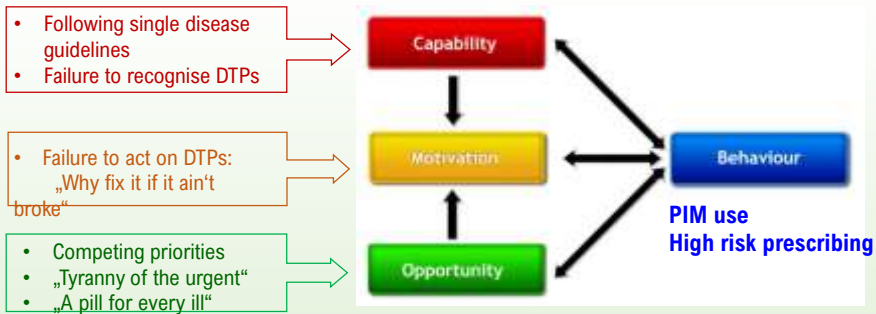
COM-B





CASE EXAMPLE – PROBLEM ANALYSIS

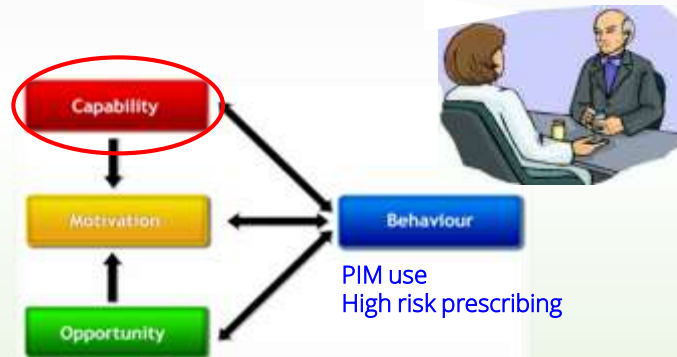
TARGET BEHAVIOUR: PIM use/High risk prescribing in general



Outline

1. What are the problems?
→ Case example and problem analysis
2. What are targets for intervention?
→ Case example and problem analysis
3. What have we learned so far?
→ Previously tested interventions

COM-B



Potential SOLUTIONS – Tools to increase capability



Leitliniengruppe Hessen
Hessische Pharmakotherapie

Polypharmacy Guidance
Realistic Prescribing
3rd Edition, 2018

DEGAM
Deutscher Gesellschaft für Allgemeinmedizin und Familienmedizin

A POCKET GUIDE TO THE 2019 AGS BEERS CRITERIA®
The EU(7)-PIM list: a list of potentially inappropriate medications for older people consented by experts from seven European countries

STOPP/START criteria for potentially inappropriate prescribing in older people: version 2
STOPPfrail (Screening Tool of Older Persons Prescriptions in Frail adults with limited life expectancy): consensus validation
Delphi study by the EuGMS Task and Finish Group on Fall-Risk-Increasing Drugs

INTERVENTIONS TARGETING CAPABILITY

RIME trial (Germany): 3-Arm cRCT in 137 general practices

TARGET BEHAVIOUR: PRISCUS-PIMs (n=80 PIMs) and DDIs involving NSAIDs and antit

Rudolf H, Thiem U, Aust K, Krause D, Klaaßen-Mielke R, Greiner W, Trampisch HJ, Timmesfeld N, Thürmann P, Hackmann E, Barkhausen T, Junius-Walker U, Wilm S: Reduction of potentially inappropriate medication in the elderly—results of a cluster-randomized, controlled trial in German primary care practices (RIME). Dtsch Arztebl Int 2021; 118: 875–82. DOI: 10.3238/arztebl.m2021.0372

INTERVENTIONS TARGETING CAPABILITY

RIME trial (Germany): 3-Arm cRCT in 137 general practices

- Educational material
 - Pocket card
 - Detailed manual
 - Training workshop
 - Pharmacologist advice via telephone upon request



INTERVENTIONS TARGETING CAPABILITY

RIME trial (Germany): 3-Arm cRCT in 137 general practices

- Educational material
 - Pocket card
 - Detailed manual
 - Training workshop
 - Pharmacologist advice via telephone upon request



Arm 1: Workshop on general aspects of polypharmacy

Arm 2: Training workshop on PRISCUS for GP only

Arm 3: Training workshop on PRISCUS for GP and practice team

INTERVENTIONS TARGETING CAPABILITY

RIME trial (Germany): 3-Arm cRCT in 137 general practices

FINDINGS at 12 months follow up:

- No significant reduction in patients with \geq PRISCUS-PIM or targeted DDIs
- No difference whether only GP or whole practice team was trained

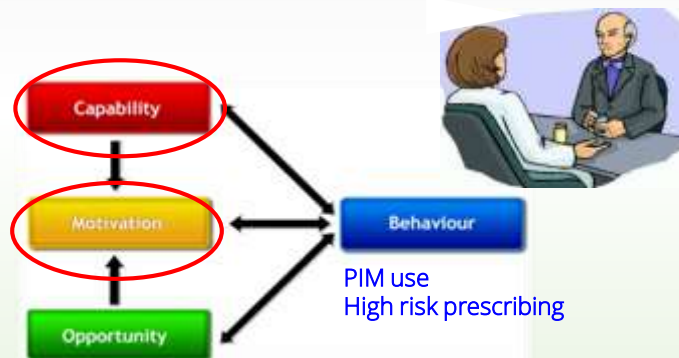
INTERVENTIONS TARGETING CAPABILITY

RIME trial (Germany): 3-Arm cRCT in 137 general practices

CONCLUSIONS

- Simple education not sufficient to reduce PIM use
- It may not be possible to stop PIMs without higher intensity interventions
- Training on a heterogeneous set of 80 PIMs at once may overwhelm prescribers

COM-B



INTERVENTIONS TARGETING CAPABILITY and MOTIVATION

EFIPPS trial (Scotland): 3 arm cRCT in 262 general practices

TARGET BEHAVIOUR: Indicators involving NSAIDs/antithrombotics (n=5) and antipsychotics

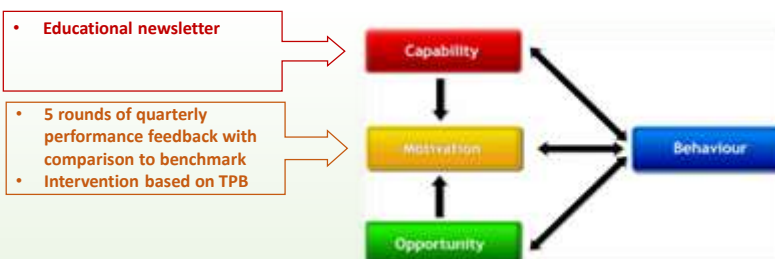
1. % ≥ 65 years and over on ACEI/ARB, diuretic AND NSAID (the "triple whammy")
2. % ≥ 75 years and over on an oral NSAID without gastroprotection
3. % ≥ 65 years and over on aspirin or clopidogrel AND NSAID without gastroprotection
4. % treated with an oral anticoagulant who are on NSAID without gastroprotection
5. % treated with an oral anticoagulant who are on aspirin or clopidogrel without gastroprotection
6. % ≥ 75 years and over and on an oral antipsychotic

Guthrie B, Kavanagh K, Robertson C, Barnett K, Treweek S, Petrie D et al. Data feedback and behavioural change intervention to improve primary care prescribing safety (EFIPPS): multicentre, three arm, cluster randomised controlled trial *BMJ* 2016; 354

INTERVENTIONS TARGETING CAPABILITY and MOTIVATION

EFIPPS trial (Scotland): 3 arm cRCT in 262 general practices

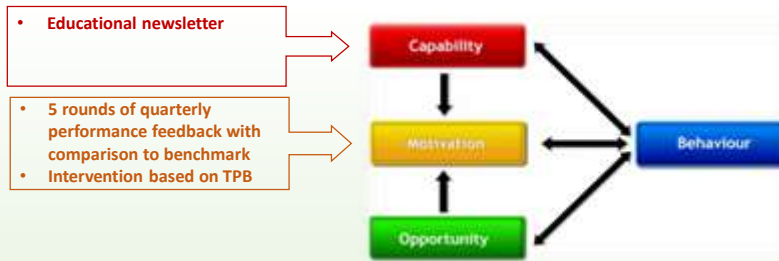
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INTERVENTIONS TARGETING CAPABILITY and MOTIVATION

EFIPPS trial (Scotland): 3 arm cRCT in 262 general practices

TARGET BEHAVIOUR: Indicators involving NSAIDs/antithrombotics (n=5) and antipsychotics



Arm 1: Educational newsletter (control)

Arm 2: Educational newsletter, performance feedback

Arm 3: Educational newsletter, performance feedback and TPB based intervention

INTERVENTIONS TARGETING CAPABILITY and MOTIVATION

EFIPPS trial (Scotland): 3 arm cRCT in 262 general practices

TARGET BEHAVIOUR: Indicators involving NSAIDs/antithrombotics (n=5) and antipsychotics

FINDINGS at 15 months follow up:

Arm 1: Reduction from 6.0% to 5.1%

Arm 2: Reduction from 5.9% to 4.6%

Arm 3: Reduction from 6.2% to 4.6%

Arm 2 vs Arm 1: OR 0.88 (p=0.007)

Arm 3 vs Arm 1: OR 0.86 (p=0.002)

✓ NSAID and antiplatelet indicators (n=5): Reductions similar to primary analysis

✗ Antipsychotic indicator (n=1): No evidence of reduction

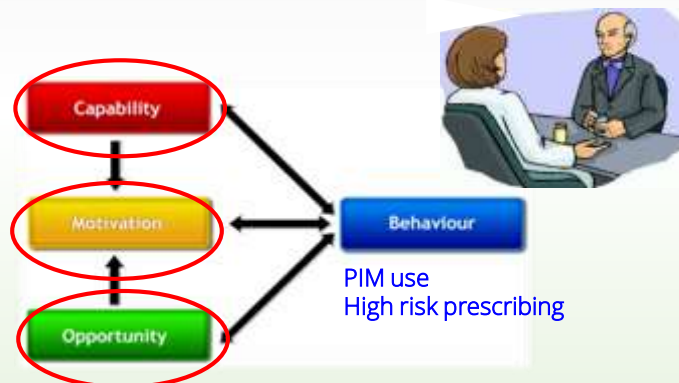
INTERVENTIONS TARGETING CAPABILITY and MOTIVATION

EFIPPS trial (Scotland): 3 arm cRCT in 262 general practices

Conclusions of the authors:

- “Given the relative ease with which feedback can be implemented (...), it has a highly plausible place (...) in prescribing safety (interventions)”
- Further research required on supplementary interventions to improve prescribing safety of antipsychotics

COM-B



INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

DQIP trial (Scotland): Stepped wedge cRCT in 34 general practices

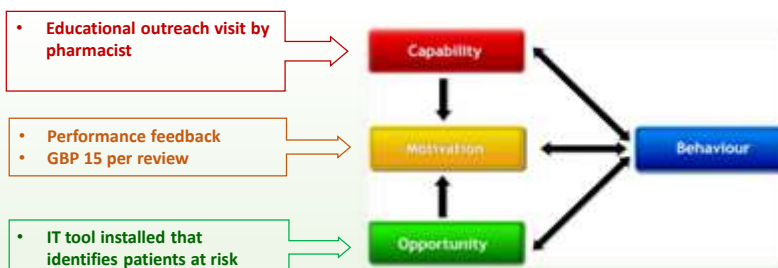
TARGET BEHAVIOUR: Indicators involving NSAIDs/antithrombotics (n=5) and antipsych

1. % with previous peptic ulcer and on NSAID or aspirin without gastroprotection
2. % ≥ 75 years and over on an oral NSAID without gastroprotection
3. % ≥ 65 years and over on aspirin AND clopidogrel without gastroprotection
4. % ≥ 65 years and over on aspirin or clopidogrel AND NSAID without gastroprotection
5. % treated with an oral anticoagulant who are on NSAID without gastroprotection
6. % treated with an oral anticoagulant who are on aspirin or clopidogrel without gastroprotection
7. % ≥ 65 years and over on ACEI/ARB, diuretic AND NSAID (the "triple whammy")
8. % with CKD and on an NSAID
9. % with CHF and on an NSAID

INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

DQIP trial (Scotland): Stepped wedge cRCT in 34 general practices

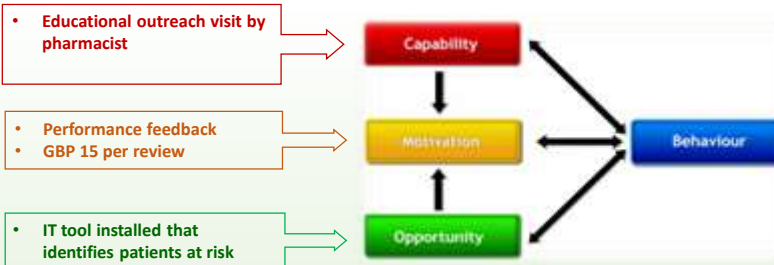
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INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

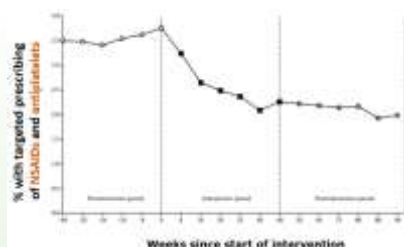
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INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

DQIP trial (Scotland): Stepped wedge cRCT in 34 general practices



FINDINGS at 12 months follow up:

OR of exposure to targeted prescribing in intervention vs control period: 0.63 ($p < 0.001$)
 OR of prevalent targeted prescribing: 0.60 ($p < 0.001$)
 OR of prevalent targeted prescribing: 0.77 ($p < 0.001$)
 OR of admissions for GI bleeding: 0.66 ($p = 0.02$)

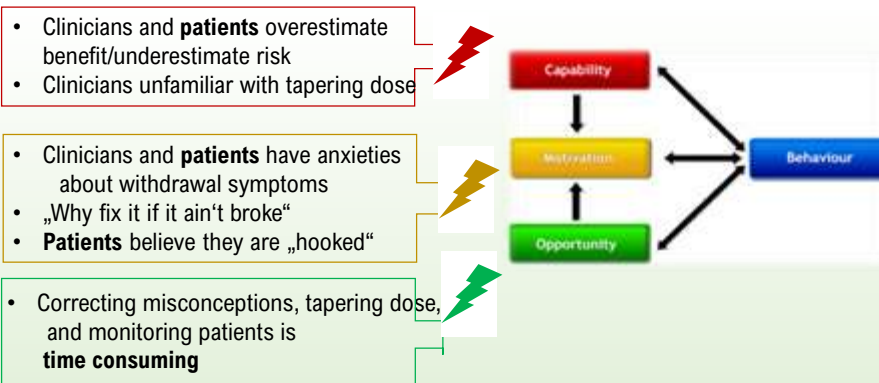
FINDINGS at 24 months follow up:

No significant change between 24 and 12 months

PRELIMINARY CONCLUSIONS

- **Physician education alone:** Unlikely to reduce PIM prescribing
- **Focus on a small set of PIMs:** More likely to be effective
- **Physician education plus performance feedback:** works for NSAIDs and antiplatelets
- **IT solutions to identify patients at risk:** Can substantially increase effect sizes achieved with education and performance feedback alone
- **Use of psychotropic drugs:** Education and performance feedback alone are not effective

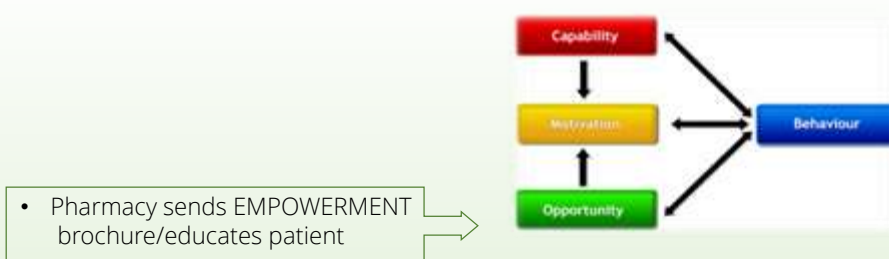
WHAT MAKES DEPRESCRIBING PSYCHOTROPICS COMPLEX ?



INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

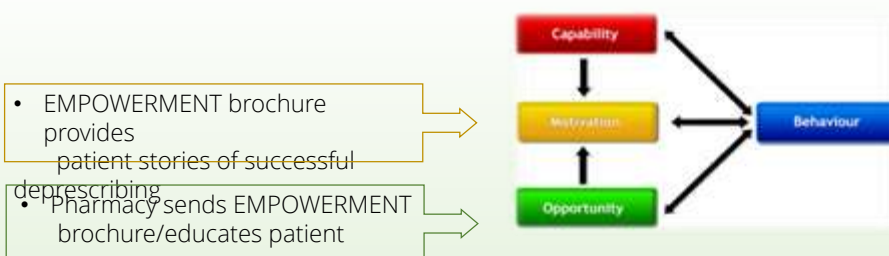
Target behaviour : Deprescribing benzodiazepines



INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

Target behaviour : Deprescribing benzodiazepines



Tannenbaum C, Martin P, Tamblyn R, Benedetti A, Ahmed S. Reduction of inappropriate benzodiazepine prescriptions among older adults through direct patient education: the EMPOWER cluster randomized trial. JAMA Intern Med. 2014; 174(6):890-8



3. WHAT HAVE WE LEARNED SO FAR?

ROOT CAUSES – capability, opportunity, motivation

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

TEST YOUR KNOWLEDGE

1. **Ativan**® is a mild tranquilizer that is safe when taken for long periods of time.
True || False ||

2. The dose of **Ativan**® that I am taking cau

3. Without **Ativan**® I will be unable to sle
anxiety.

4. **Ativan**® is the best available option to tr

ANSWERS



1. FALSE. It is not recommended to take **Ativan** for longer than 2 to 4 weeks. People who take it for longer periods of time are putting themselves at a
➤ 5 times more at risk of memory and concentration problems



3. WHAT HAVE WE LEARNED SO FAR?

ROOT CAUSES – capability, opportunity, motivation

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

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ANSWERS



SO ASK YOURSELF...yes or no?

1. FALSE. It is not recommended to take **Ativan** for longer than 2 to 4 weeks. People who take it for longer periods of time are putting themselves at a
➤ 5 times more at risk of memory and concentration problems
- ...HAVE YOU BEEN TAKING **ATIVAN**® FOR MORE THAN 4 WEEKS?
- ...ARE YOU STILL TIRED AND OFTEN GROGGY DURING THE DAY?
- ...DO YOU EVER FEEL HUNGOVER IN THE MORNING, EVEN THOUGH YOU HAVE NOT BEEN DRINKING?
- ...DO YOU EVER HAVE PROBLEMS WITH YOUR MEMORY OR YOUR BALANCE?



3. WHAT HAVE WE LEARNED SO FAR?

ROOT CAUSES – capability, opportunity, motivation

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

Mrs. Robinson's story

"I am 65 years old and took *Ativan*® for 10 years. A few months ago, I fell in the middle of the night on my way to the bathroom and had to go to the hospital. I was lucky and, except for some bruises, I did not hurt myself. I read that *Ativan*® puts me at risk for falls. I did not know if I could live without *Ativan*® as I always have trouble falling asleep and sometimes wake up in the middle of the night."

Under supervision of your doctor

Weeks	Weaning Schedule							✓
	Mon	Tues	Wed	Thurs	Fri	Sat	Sun	
1 and 2	●	●	●	●	●	●	●	
3 and 4	●	●	●	●	●	●	●	

Please Consult your Doctor or Pharmacist
Before Stopping Any Medication.



INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

Target behaviour : Deprescribing benzodiazepines

- Pharmacist sends evidence based recommendation to GP

- EMPOWERMENT brochure provides patient stories of successful deprescribing

- Pharmacy sends EMPOWERMENT brochure/educates patient





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Arm 1: EMPOWER intervention

Arm 2: Usual care



INTERVENTIONS TARGETING CAPABILITY, MOTIVATION and OPPORTUNITY

EMPOWER trial (CANADA): 2 arm cRCT in 30 community pharmacies

FINDINGS at 6 months follow up:

- 62% of patients in the intervention arm initiated conversation with a physician and/or pharmacist.
- 27% vs 5% of intervention vs control group discontinued benzodiazepine (risk difference, 23%[95%CI, 14%-32%], 0.008; NNT 4).
- Dose reduction occurred in an additional 11% (95%CI, 6%-16%).
- Age, sex, duration of use, indication for use, dose, previous attempt to taper, and concomitant polypharmacy (10 drugs or more per day) did not alter effect



SUMMARY

- Managing polypharmacy is complex and time consuming
- Inappropriate polypharmacy is a heterogeneous problem:
 - **Type 1 - PIMs** that are easy to deprescribe or address with little resistance from patients and no withdrawal symptoms
 - Providing education and incentives may be sufficient
 - **Type 2 - PIMs** that are challenging and time consuming to deprescribe because of misconceptions about drugs and need for tapering
 - Direct patient education is additionally necessary to address type 2 PIMs

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CASE EXAMPLE



.... what about these? →

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→ Ongoing need?

→ Risk of bleeding

→ Risk of bleeding

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→ Risk of AKI

→ Indication?/ Risk of falls

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→ Ongoing need?

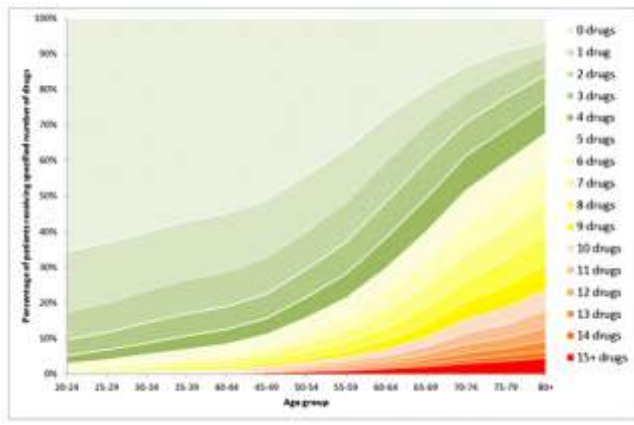
Potential SOLUTIONS – Tools to increase capability



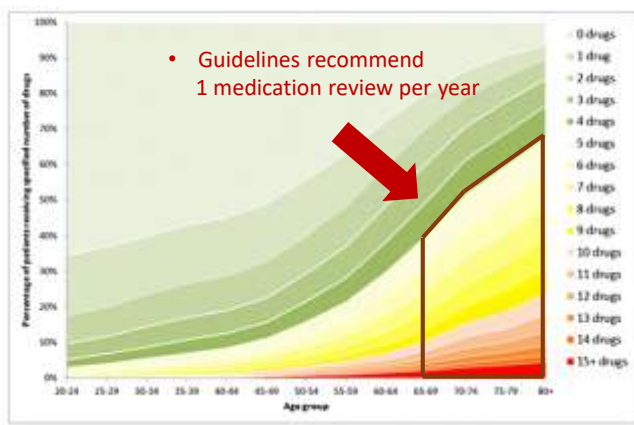
Guidelines recommend
annual medication review



WORKLOAD



WORKLOAD



WORKLOAD – DEMAND vs SUPPLY in GERMANY

Assumptions

- 9.5 million Germans aged 67 years or older with polypharmacy in 2030
- 44,000 GPs in 2030
- Guidelines recommend 1 medication review per year
- Medication review lasting 60 minutes each (including follow up)

Implications

- Every GP has to do on average 216 medication reviews per year
- This equates to ca. 5.0 additional (?) working hours/week

WORKLOAD – DEMAND vs SUPPLY in GERMANY

Opportunities

- There are approximately 20.000 community pharmacies
- Pharmacist medication review now reimbursed in Germany

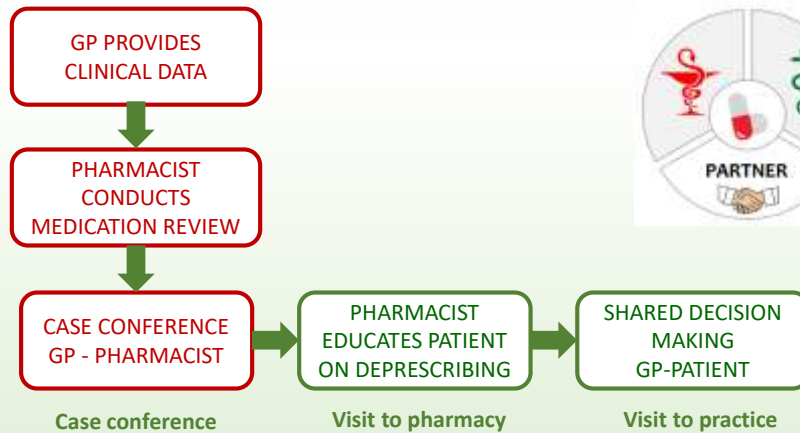
Challenges

- Pharmacist still lacks clinical information
- Pharmacists adequately trained?
- Trust issues: Discordance between pharmacist and GP care fuels concerns by physician (organisations)



Pharmacist acts in concert with GP

PARTNER trial (GERMANY): 2 arm cRCT in ~50 practices/pharmacies



Pharmacist acts in concert with GP

PARTNER trial (GERMANY): 2 arm cRCT in ~50 practices/pharmacies



Please, come and see our poster (PDF-5.01) !



Thank you!

Any questions?

