Part 1: Introduction

Part 2: Risk Factors

Part 3: Evidence for fall prevention interventions

Part 4: Centre of Expertise for Fall & Fracture prevention

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**Introduction**

- ±2700 falls per year
- ±245 ED admissions per year
- ±2 deaths per year

(CDC Important Facts about Falls, 2017)
Women fall more than men
Restraints help to prevent fall incidents
Most fall incidents are caused by obstacles such as carpets, etc.
Older persons with a hip fracture have a higher mortality rate.
Multifocal glasses are recommended to prevent falls
Fall incidence 65+ community versus nursing home

Incidence per setting

- Fall ≥ 1 / Year
  - Community: 35%
  - Nursing home: 70%

- Fall ≥ 2 / Year
  - Community: 31%
  - Nursing home: 40%
Consequences fall
- Physical
  - Minor injury: 17-20%
    - e.g. bruise, sprain
  - Severe injury: 10-15%
    - e.g. Hip fracture: 4,6%
- Psychosocial
- Others

- Only 13% regains ADL independence
- 35% dies within one year
- Mortality risk remains 10-15% after hip fracture
Introduction: consequences

Number of deaths in the VS, aged 65 to 74 as a result of accidental injuries (2012)

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>3,332</td>
</tr>
<tr>
<td>MV Traffic</td>
<td>2,954</td>
</tr>
<tr>
<td>Poisoning</td>
<td>1,060</td>
</tr>
<tr>
<td>Suffocation</td>
<td>746</td>
</tr>
<tr>
<td>Unspecified</td>
<td>571</td>
</tr>
<tr>
<td>Fire/burn</td>
<td>415</td>
</tr>
<tr>
<td>Drowning</td>
<td>259</td>
</tr>
<tr>
<td>Natural/ Environment</td>
<td>212</td>
</tr>
<tr>
<td>Other Spec., classifiable</td>
<td>170</td>
</tr>
<tr>
<td>Other Spec., NEC</td>
<td>169</td>
</tr>
<tr>
<td>Other Land Transport</td>
<td>130</td>
</tr>
<tr>
<td>Other Transport</td>
<td>120</td>
</tr>
<tr>
<td>Struck by or Against</td>
<td>115</td>
</tr>
<tr>
<td>Machinery</td>
<td>107</td>
</tr>
<tr>
<td>Pedestrian, Other</td>
<td>88</td>
</tr>
<tr>
<td>Firearm</td>
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</tr>
<tr>
<td>Pedal cyclist, Other</td>
<td>41</td>
</tr>
<tr>
<td>Cut/pierce</td>
<td>22</td>
</tr>
<tr>
<td>Overexertion</td>
<td>4</td>
</tr>
</tbody>
</table>

n=10,558

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, WISQARS
Introduction: consequences

Number of deaths in the VS, aged 75 to 84 as a result of accidental injuries (2012)

<table>
<thead>
<tr>
<th>Cause of Death</th>
<th>Number of Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall</td>
<td>7,776</td>
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<tr>
<td>MV Traffic</td>
<td>2,233</td>
</tr>
<tr>
<td>Unspecified</td>
<td>1,288</td>
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<tr>
<td>Suffocation</td>
<td>1,137</td>
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<tr>
<td>Fire/burn</td>
<td>373</td>
</tr>
<tr>
<td>Poisoning</td>
<td>357</td>
</tr>
<tr>
<td>Other Spec., NEC</td>
<td>216</td>
</tr>
<tr>
<td>Natural/ Environment</td>
<td>194</td>
</tr>
<tr>
<td>Drowning</td>
<td>180</td>
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<tr>
<td>Other Land Transport</td>
<td>97</td>
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<tr>
<td>Pedestrian, Other</td>
<td>91</td>
</tr>
<tr>
<td>Machinery</td>
<td>87</td>
</tr>
<tr>
<td>Other Spec., classifiable</td>
<td>83</td>
</tr>
<tr>
<td>Struck by or Against</td>
<td>73</td>
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<tr>
<td>Other Transport</td>
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</tr>
<tr>
<td>Pedal cyclist, Other</td>
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<tr>
<td>Cut/pierce</td>
<td>23</td>
</tr>
<tr>
<td>Firearm</td>
<td>22</td>
</tr>
<tr>
<td>Overexertion</td>
<td>2</td>
</tr>
</tbody>
</table>

n=14 303

National Center for Injury Prevention and Control, Centers for Disease Control and Prevention, WISQARS

www.valpreventie.be expertisecentrum@valpreventie.be
Introduction: consequences

Number of deaths in the VS, aged 85+ as a result of accidental injuries (2012)

- Fall: 13,082
- Unspecified: 2,805
- Suffocation: 1,520
- MV Traffic: 1,191
- Other Spec., NEC: 273
- Poisoning: 238
- Fire/burn: 233
- Natural/ Environment: 171
- Drowning: 85
- Other Land Transport: 62
- Pedestrian, Other: 60
- Struck by or Against: 35
- Other Spec., classifiable: 30
- Machinery: 24
- Cut/pierce: 10
- Pedal cyclist, Other: 10
- Firearm: 4
- Other Transport: 4

n=19,837
• Consequences fall
  – Physical
  – **Psychosocial:** e.g. Fear of falling
  – Others

---

Fall risk

```
Introduction: consequences

• Consequences fall
  – Physical
  – Psychosocial
  – Others:
    • Economic consequences
    • Legal consequences
    • Feelings of fear or guilt
Content

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Part 6: Conclusion
• Fall = acute event
• Fall risk = chronic condition
• Complexity of a fall → mostly interaction of various risk factors

<table>
<thead>
<tr>
<th>INTRINSIC</th>
<th>EXTRINSIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impaired balance, mobility and muscle strength</td>
<td>Environmental factors e.g. poor lighting, …</td>
</tr>
<tr>
<td>Orthostatic hypotension</td>
<td>Behavior older person</td>
</tr>
<tr>
<td>Impaired vision</td>
<td>Polypharmacy</td>
</tr>
<tr>
<td>Functional &amp; cognitive decline</td>
<td>Hazardous medication</td>
</tr>
<tr>
<td>...</td>
<td>...</td>
</tr>
</tbody>
</table>
Risk factors: fall case

• Maria, 85 year old woman
• Assisted living facility
• Medical history: cognitive impairment & osteoporosis
• Problems with mobility
• Different medicines
• …
Risk factors

- Interaction RF precipitating to falls
  (Cambell 2006)

80 year old woman living alone during the winter
• Interaction RF predisposing to falls
  (Cambell 2006)
Risk factors

- Declined mobility, balance or muscle strength
- Cognitive decline
- Medication
- Orthostatic hypotension
- Declined sight
- Feet & shoes
- Unsafe environment
- Risky behavior

FALL RISK

- Fall history
- Old age
- Low vit. D level
- Pain
- Fear or falling
- Urinary incontinence
Which fall risk factors can you identify in Maria's case?
Part 1: Introduction

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• In literature different types of interventions exist:
  – Unifactorial interventions
  – Multiple interventions
  – Multifactorial interventions

(Lamb et al. 2007, Lamb et al. 2011)
• Unifactorial interventions:

1

to all

(Lamb et al. 2007, Lamb et al. 2011)
• Multiple interventions:
  more than one
  to all

(Lamb et al. 2007, Lamb et al. 2011)
• Multifactorial interventions: more than one individual assessment

(Lamb et al. 2007, Lamb et al. 2011)
Which type of intervention will be the most effective for fall prevention

- Unifactorial interventions
- Multiple interventions
- Multifactorial interventions
Evidence: nursing homes

- Systematic review and meta-analyse
- Belgian context

Characteristics and Effectiveness of Fall Prevention Programs in Nursing Homes: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Ellen Vlaeyen, MSN, a Joke Coussment, MSN, a,b Greet Leysens, MSN, a, Elisa Van der Elst, MSN, a Kim Delbaere, MPT, PhD, c Dirk Cambier, MPT, PhD, d Kris Denhaerens, MSN, PhD, e Stefan Goemaere, MD, f Arlette Wertelaers, MD, g Fabienne Dobbels, PhD, a Eddy Dejaegere, MD, PhD, b and Koen Milisen, MSN, PhD, a,b on behalf of the Center of Expertise for Fall and Fracture Prevention Flanders
Evidence: nursing homes

• Characteristics fall prevention programs
  – 6 unifactorial
    • Training & education (3)
    • Medication (2)
    • Vitamin D supplements (1)
    • Exercise program (1)
  – 1 multiple
    • Exercise program & continence training (1)
  – 6 multifactorial

(Vlaeyen et al. 2015)
### Evidence: nursing homes

- Characteristics multifactorial fall prevention programs

<table>
<thead>
<tr>
<th>Study</th>
<th>Exercise program</th>
<th>Medication</th>
<th>Orthostatic hypotension</th>
<th>Environment</th>
<th>Hip protector</th>
<th>Sight</th>
<th>Feet &amp; shoes</th>
<th>Goal setting &amp; Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Becker</td>
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<td>0</td>
<td>0</td>
<td>X</td>
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<tr>
<td>Rapp</td>
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<td>X</td>
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<td>X</td>
<td>0</td>
<td>0</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

→ Multidisciplinary interventions in all studies except Kerse et al.

(Vlaeyen et al. 2015)
• Conclusion new meta-analysis
  – No significant decrease in
    • Number of falls
      (RR=0.93, 95% CI: 0.76-1.13)
    • Number of fallers
      (RR=0.97, 95% CI: 0.84-1.11)
  – **BUT 21% ↓** recurrent fallers
    (RR=0.79, 95% CI: 0.65-0.97)

(Vlaeyen et al. 2015)
Evidence: nursing homes

- Conclusion new meta-analysis
  (priori subgroep analyses)
  - Unifactorial: no effect
    - CAVE: training & education: 29% ↑ falls
      (RR=1.29, 95% CI: 1.23-1.36)
  - Multiple: no effect
  - Multifactorial MD-team:
    - 33% ↓ falls
      (RR=0.67, 95% CI: 0.55-0.82)
    - 21% ↓ recurrent fallers
      (RR=0.79, 95% CI: 0.65-0.97)
    - No effect on number of fallers
      (RR=0.83, 95% CI: 0.68-1.01)

(Vlaeyen et al. 2015)
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Centre of Expertise (EVV)

Samen voor valpreventie

www.valpreventie.be

Expertisecentrum Val- en fractuurpreventie Vlaanderen

Vak is ouderen zich nog te weinig bewust dat het voorkomen van valincidenten mogelijk is. Gedachten zoals “ik ben te oud geworden”, “er is niets meer aan te doen” of “valen overkomt mij niet” belemmeren dikwijls dat ouderen iets aan hun valrisico (laten) doen.
Missions:
1. Provide information & advice
2. Develop materials & methods
3. Implement materials & methods

Target group: 65+, family carers, GP’s, nurses, nurses aids, occupational therapists, fysiotherapists, other health care workers, cleaning service, municipalities and cities, ...
Goal

• Provide an overview of available scientific evidence, supplemented with clinical expertise
• Guideline that can help detect, evaluate, treat and prevent falls

Overview

• Community (Milisen et al., 2017)
• Nursing homes (Milisen et al., 2012)
• Hospitals (Milisen et al., 2009)
Fall prevention = multidisciplinary

- GP
- Physiotherapist
- Nurse
- Occupational therapist
- Other disciplines
Practice guideline: nursing homes

Fall prevention = multidisciplinary

- GP
- Physiotherapist
- Nurse
- Occupational therapist
- Nurses aids
- Other disciplines

Valpreventie in Noonzorgcentra
Praktijkrichtlijn voor Vlaanderen

Valpreventie in Noonzorgcentra
Praktijkrichtlijn voor Vlaanderen
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Take home...
Conclusion

• Fall incidents are a significant threat to older people’s health: prevention is needed
• Methods / materials are available (e.g. EVV guidelines) www.valpreventie.be
• Effective strategies? Multifactorial!
• Multidisciplinary collaboration & teamwork
• Questions? Ellen.vlaeyen@kuleuven.be