Nordic Pole Walking & Fall Prevention
Causes for Falling

Endogenous Factors
1. Physiological causes
2. Psychological causes
3. Cognitive causes

Exogenous factors
1. Changing light conditions
2. Floor situation
3. Type of shoes, clothing,...
Causes for Falling

- German Studies on Falls Frequency:
  - 70% caused through endogene factors: lack of motor skills
  - 30% caused through exogene factors

Conclusion:
- Maintain and improve motor skills.
- Manage personal environment
We are born to Move.

Focus: Human’s five Motor Skills

- Endurance
- Strength
- Coordination/Orientation
- Flexibility
- Speed
Loss of postural Control

1. Decreased Motor Skills:
   - Muscle weakness in Legs and Trunk
   - Reduced functioning of the Cardiovascular System
   - Lack of Coordination
   - Lack of Flexibility
   - Gait Changes
   - Balance Disturbances
Loss of postural Control

2. Psychological Factors

- Fear to fall.
- Medication with sedative effects.
- Diseases leading to Loss of Mobility, Motoric Skills, Sensivity, Vision.
- Impaired Cognitive Ability.

“Coordination & Balance Training vs. Nordic Pole Walking”

Results: both groups improved.

Nordic Pole Walking improved additionally:
- **Balance** (due to increased strength in Upper Body and Legs).
- Weight Loss
- Walking Gait
- Muscle Endurance
- Less Fear
Exercising: How do get People motivated?

- Seniors in Canada: Report Card 2006
  56% over 65 are inactive

Physical activity shall fulfill criterias like:

- Easy to access
- Low impact – but effective
- Easy to learn and perform
- Low cost

- 80% Canadians claim Walking as preferred physical activity.
How Nordic Pole Walking improves Motor Skills

Nordic Pole Walking is the most effective low-impact Physical Activity for all Ages and Fitness Levels

Strength – Cardio – Coordination - Flexibility
For Fitness & Stability/Mobility
Important for Balance & Mobility

- **Upper Body Strength** (Muscle Endurance)
- **Leg Strength** (Muscle Endurance)
- **Muscle-Nerve Coordination**
- **Cardiovascular Fitness**
- **Flexibility**
- **Sensitivity**
- **Orientation**

...to be trained through full body exercises.
NPW strengthens more than 90% of Body Muscles

NPW: All Upper Body Muscles (50%) strengthened

Walking: Only lower body muscles (50%) trained
EMG: Upper Body Muscle Engagement

…with Walking Tempo at Heart Rate Frequency (HR):

- 165HR
- 130HR
- 100HR

Boes et.al.
University Karlsruhe, Germany, 2004.
% of Muscles involved

Stationary Bicycle
approx. 40%

Walking / Jogging
approx. 50%

Nordic Pole Walking
More than 90%
> 600 muscles
## Weight Loss - Calorie Burning Rate/hr

<table>
<thead>
<tr>
<th>Activity</th>
<th>Calories/hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stationary Bicycle</td>
<td>210 kcal</td>
</tr>
<tr>
<td>Walking</td>
<td>240 kcal</td>
</tr>
<tr>
<td>Slow Jogging</td>
<td>280 kcal</td>
</tr>
<tr>
<td>Swimming</td>
<td>330 kcal</td>
</tr>
<tr>
<td>Aerobics</td>
<td>440 kcal</td>
</tr>
<tr>
<td>Nordic Pole Walking</td>
<td>600 - 900 kcal</td>
</tr>
</tbody>
</table>

For BMI 27+, untrained
Improvement of Postural Control

- **NPW improves Postural Control,**
- **Muscular Strength of lower Extremeties and middle Trunk**  
  (Koskinen et al. 2003)
Improvement of Segmental Stability

- “Segmental Stability“
  → Control of Motion between surfaces of vertebrae

- Ability of spine to stack itself correctly

- Deep, middle and superficial muscles

- “Segmental Stability“ is connected with the regulation of the muscle-tonus

(u.a. Knutson 2000)
NPW is highly beneficial for Seniors

Parkatti et al. (2002)

“Increased body functions of everyday life for older sedentary people through Nordic Pole Walking”:

- Increased Muscle Strength
- Increased Flexibility
- Increased Cardio
- Increased Coordination
Increased Functional Benefits for Seniors

Parkatti et al.. Virginia, USA, 2002

Eighteen 73-year old (62-87 yrs) person participated. They did exercise 60 min twice a week for 12 weeks by Nordic Walking.

Functional capacity battery of tests included: chair stand, arm curl, chair sit and reach, scratch test, 2 min step in place and "up and go" test was used before/after intervention.

Also a health questionnaire was used.

The results of all functional tests were statistically significantly better after training.

The study showed that NPW is suitable for elderly and effective to improve functional capacity.
Less Impact on Joints

Mayo Clinic, Rochester, USA
Physical medicine and rehabilitation specialist
Edward R. Laskowski, M.D.

- “Walking poles take some of the load off your lower back, hips and knees, which can be helpful if you have arthritis or back problems.

- The arm movement also fosters balance and stability.”
Endurance: NPW improves Cardiovascular System

• Acute Responses to Using Walking Poles in Patients with Coronary Heart Disease:

Acute Physiological Responses to Walking With Without Poles

<table>
<thead>
<tr>
<th></th>
<th>No Poles</th>
<th>Poles</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HR (bpm)</td>
<td>98</td>
<td>112</td>
<td>+ 14bpm (68% - 78% HRmax)</td>
</tr>
<tr>
<td>SBP (mm Hg)</td>
<td>136</td>
<td>152</td>
<td>+ 16mmHg</td>
</tr>
<tr>
<td>DBP (mm Hg)</td>
<td>74</td>
<td>78</td>
<td>+ 4mmHg</td>
</tr>
<tr>
<td>VO2 (ml/min/kg)</td>
<td>14.7</td>
<td>18.5</td>
<td>+ 21% increase</td>
</tr>
<tr>
<td>O2 pulse (ml/beat)</td>
<td>13.8</td>
<td>14.8</td>
<td>+ 7% increase</td>
</tr>
<tr>
<td>RPE</td>
<td>11.8</td>
<td>12.9</td>
<td>(nearly equal)</td>
</tr>
</tbody>
</table>

SBP = Systolic Blood Pressure  
DBP = Diastolic Blood Pressure  
RPE = Rate of Perceived Exertion

Walter et al. (1996) Journal of Cardiopulmonary Rehabilitation 16(4); 245-250.  
NPW decreases High Blood Pressure very effectively

Ishikawa et. al., 1999. C. Diehm, University Cologne, 2007

-17mmHG
Most effective for Diabetes

Cardiovascular and Resistance Training in one Exercise
(Guidelines International Diabetes Associations)

plus
Nordic Pole Walking helps Patients suffering Diabetes Type-2

Nischwitz et.al. Medical University Munich, 2006
Clinic Bad Wiessee, 2006

**Study:** Influence of NPW on Diabetes Medication
- 1 Year – 19 Diabetics
- 2 x 45 Min. NPW per week

**Results:** after 3 months:
- average weight loss: -1.5kg
- HbA1c: - 15%
- Reduction of medication!!!
- 3 patients needed no medication at the day of Nordic Pole Walking
Resistance Training is Key for Osteoporosis Prevention

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Pusch, University Graz, Austria, 2006.

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“Nordic Pole Walking strengthens muscles of the cervical spine and lumbar spine, pain reduction, and bone conversion.”

University of Konstanz, Germany, Koehler.R., 2008.

“Nordic Pole Walking is ideal for fall prevention through improving fitness parameters”.

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Walker - Cane vs. Nordic Pole Walking
Study: Nordic Walking Poles – Canes - Walkers


- ...at a Santa Barbara retirement community suggested that poling improved stability, mobility and posture for older adults

- Average age of participants was over 80. Many participants were previous cane and walkers users.
Fall Prevention

- “Decreased balance is a major contributor to accidental falls in the elderly.

- **Walking poles** provided **increased gait stability** at both preferred and **fast speeds** in general by mainly **increasing Maximum Attainable Base of Stability (MABOS)**.”
Exercises for Strengthening – Balance - Flexibility
Training of Motor Skills: It’s never too late!!!

Forever Fit? – Yes!

“Use it – or lose it…”

Fauja Singh
Age: 101
THANK YOU

Dr. Klaus Schwanbeck