

# Aging with spinal cord injury: quality of life

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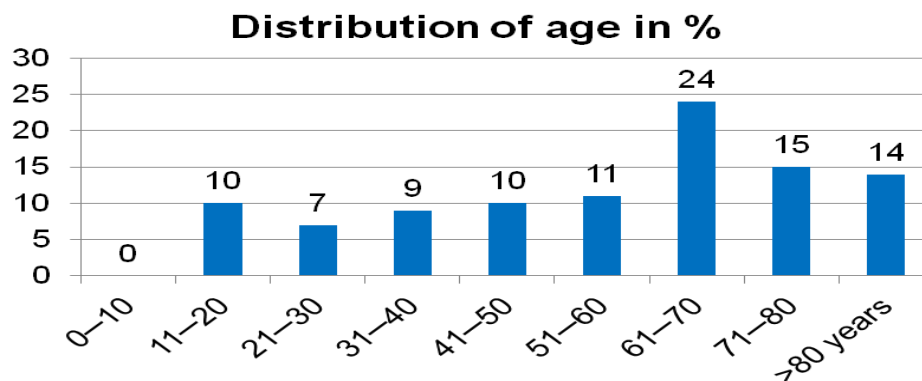
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# Age-related factors in SCI

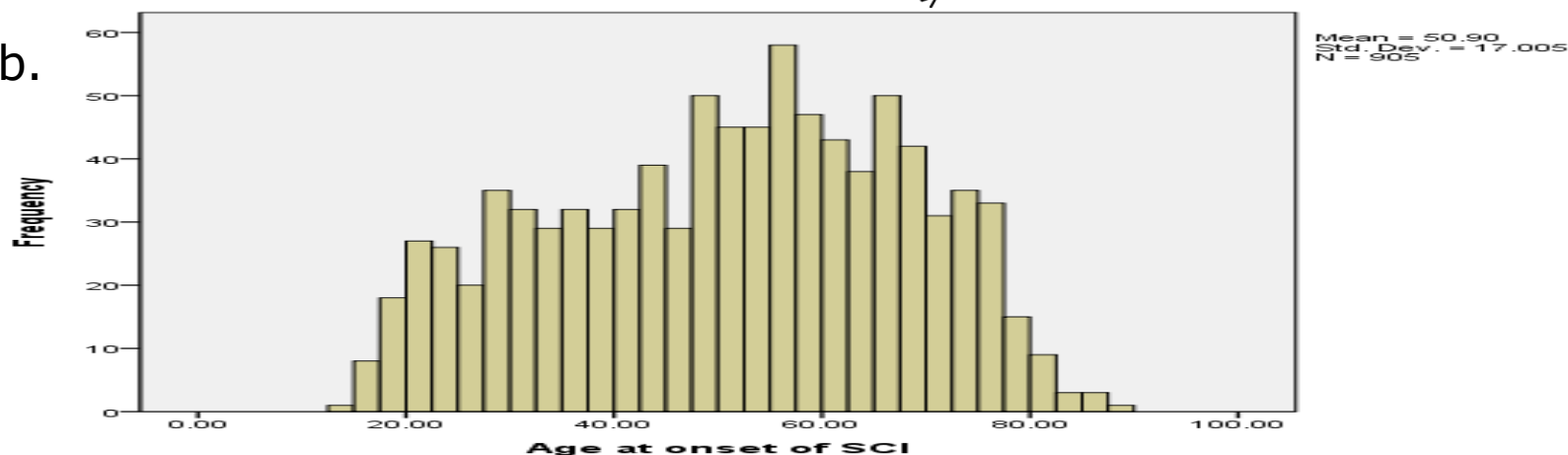
- General
  - Current chronologic age
  - Generation effect
- SCI-specific
  - Generation effect
  - Age at injury
  - Duration of injury
- Two different groups
  - Persons who obtain SCI at later age
  - Persons with SCI who grow older

# Age at onset

Hospital

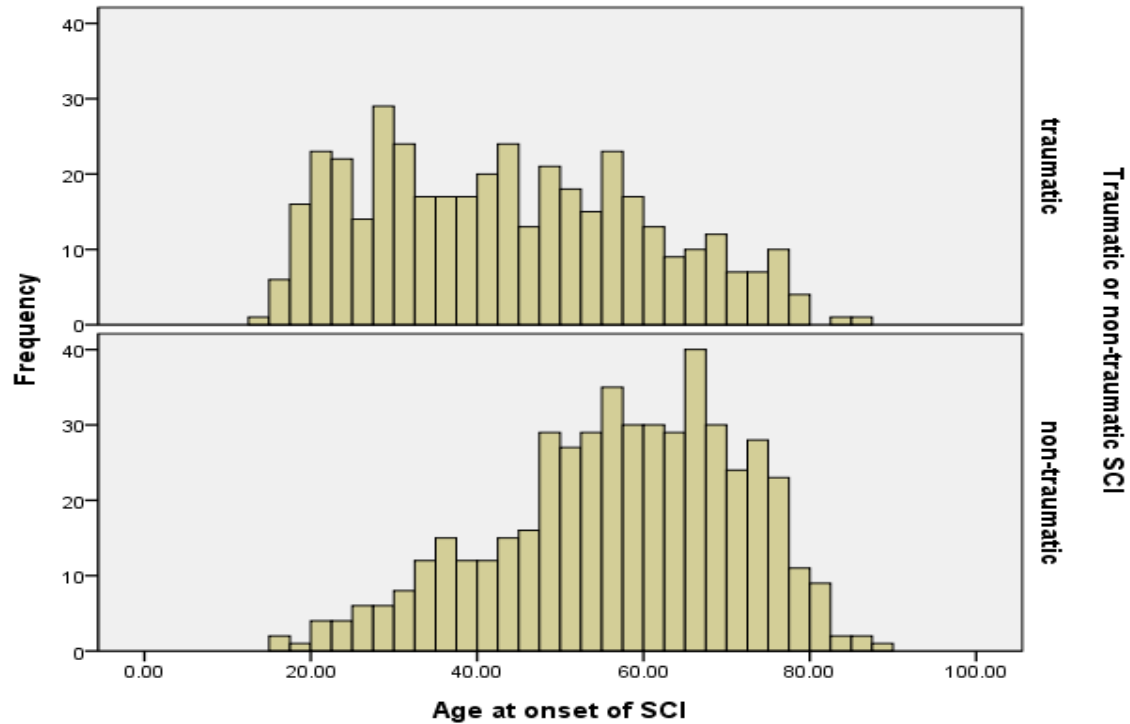


Rehab.



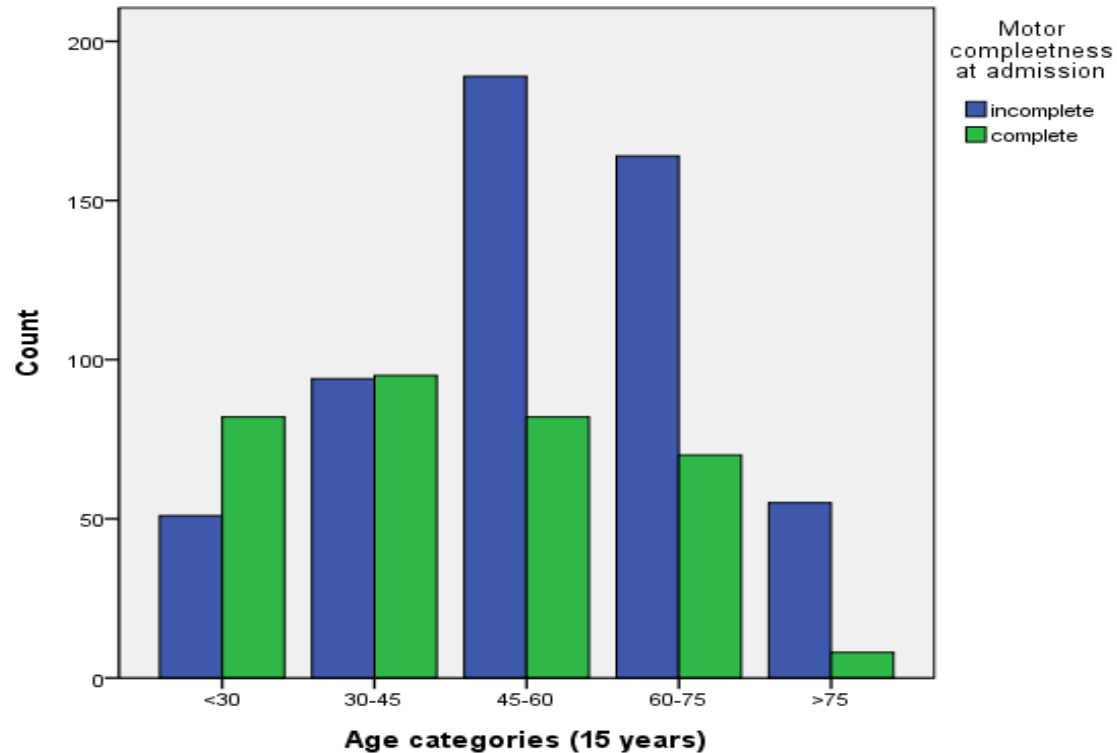
Nijendijk et al., Spinal Cord 2014  
Osterthun et al., Spinal Cord 2009

# Age and etiology



Osterthun et al., Spinal Cord 2009

# Age and severity



Osterthun et al., Spinal Cord 2009

# **SCI in elderly persons**

# Hospital data Traumatic SCI

- Single-hospital Philadelphia (N=3481)
- Increase T-SCI patients >70 yr  
4 =>15%
- In elderly 73% due to falls
- In-hospital mortality > 70 yr = 27.7 %  
< 70 yr = 3.2 %

Fassett et al., J Neurosurg Spine, 2007

# High In-hospital mortality 70+

- Spine
  - Pre-existing cervical spondylosis / stenosis,
  - Poor bone quality
- General medical condition
  - Imaging and post-operative management
  - Co-morbidity
  - Greater chance on complications
- „All the studies demonstrate that many elderly patients who survive have some degree of neurological and functional recoveries“

Radcliff et al., Top Spinal Cord Inj Rehabil 2010 p.92

Causes of in-hospital death after traumatic spinal cord injury in the Netherlands  
R Osterthun, The Netherlands



# Age and functional outcome of Rehabilitation

Age	N	Admission Score (0-20)	Discharge Score (0-20)	Improvement
< 30	134	6	16	9
30-45	193	6	17	8
45-60	274	8	17.5	6
60-75	239	8	16	6
> 75	64	7	15	6

Osterthun et al., Spinal Cord 2009

# Quality of life?

- ??

**Persons with SCI growing older**

# Long-term mortality (US)

**Table 5: Percentage of Persons Who Die Each Year by Age and Injury Severity**

Age (y)	Non-SCI <sup>44</sup>	All SCI	AIS A	Cervical AIS A
0–19	0.01	0.6	0.7	1.1
20–24	0.1	0.7	0.9	1.3
25–29	0.1	0.7	0.9	1.2
30–34	0.1	0.9	1.2	1.6
35–39	0.1	1.1	1.5	2.1
40–44	0.2	1.4	1.8	2.6
45–49	0.4	1.9	2.6	3.5
50–54	0.5	2.5	3.2	4.8
55–59	0.7	3.2	4.4	7.2
60–64	1.1	4.3	5.6	8.9
65–69	1.7	5.6	7.7	12.2
70–74	2.6	8.4	10.8	17.0
75–79	4.1	11.9	17.7	33.3
80–84	6.5	13.8	24.4	44.3
85–89	10.3	18.1	30.0	42.9

DeVivo and Chen, Arch Phys Med Rehabil 2011, 336

# Premature aging in SCI

- Sitting life
  - Loss of muscle mass, bone mineral density
- Over-weight, cardiovascular problems
- Frequent infections
  - Systemic inflammation, arteriosclerosis
- Upper extremity overload

# Changes associated with aging

- Abilities
  - Skills that were developed may be lost.
- Activities
  - May become more difficult or not possible.
- Work capacity
  - Job roles may need to be changed or ceased.
- Personal identity
  - Change of personal roles and activities often contributes to a change in a person's sense of self
- Relationships
  - Caused by change in activity, function and psychological state

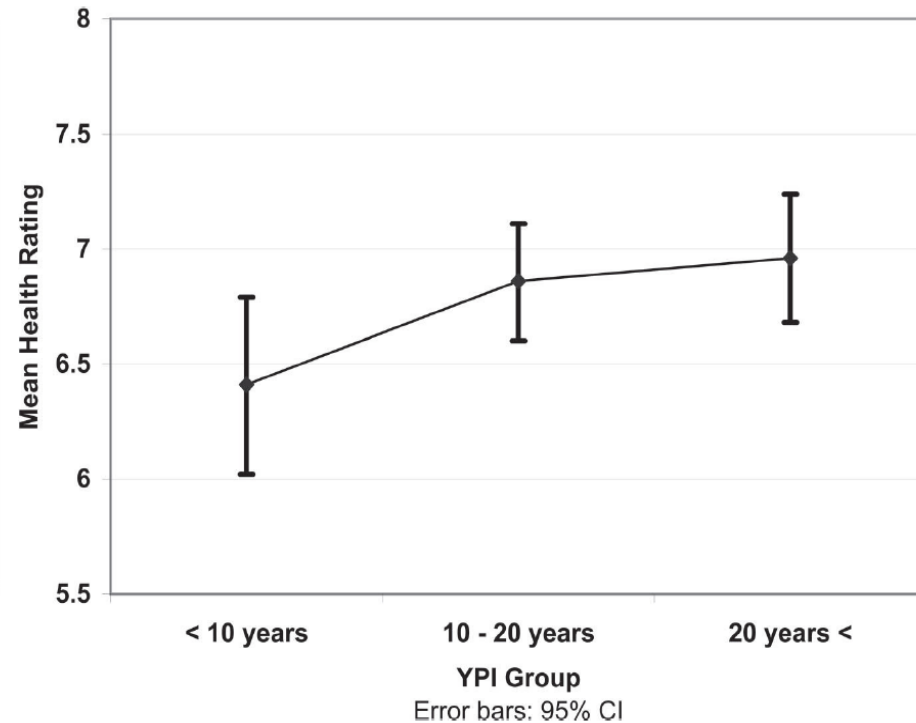
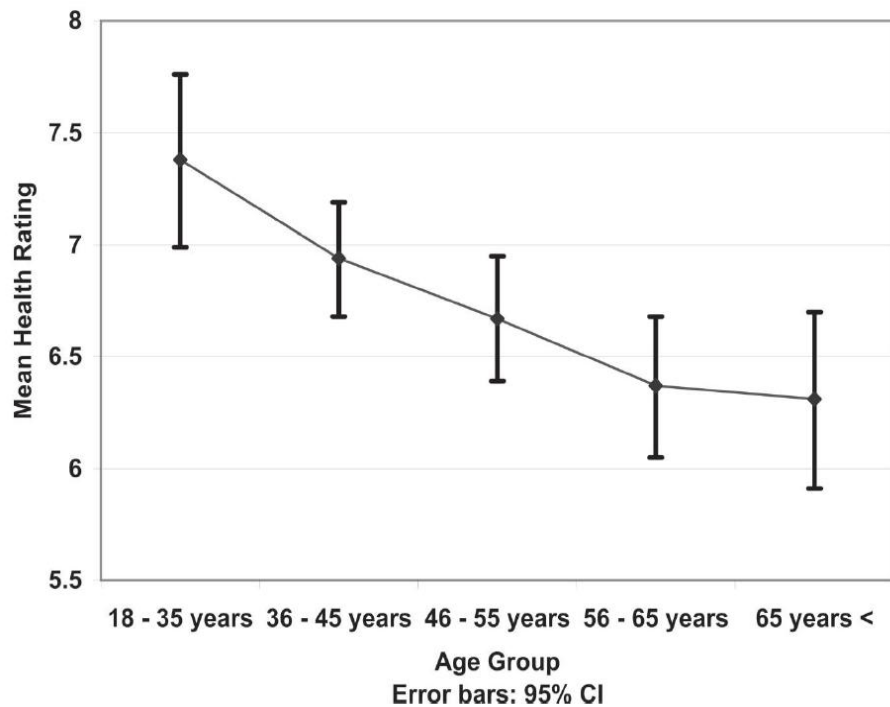
# Quality of life over time (GB)

Quality of Life Reports over Time (25 – 35 yrs post SCI)

	1990	1993	1996	1999
Excellent/Good QOL	78.1%	82.8%	75.5%	75.2%
Fair QOL	18.0%	13.2%	20.7%	20.4%
Poor QOL	3.9%	4.0%	3.7%	4.3%

Charlifue and Gerhart, Neurorehabil 2004 p.18

# Self-rated health (cross-sectional)



Hitzig et al., Am J Phys Med Rehabil 2008, 552



# Longitudinal data (US; N=78)

	1973	1988	2002
Hospitalizations	1.6	0.9	1.1
Satisf.w. health	4.0	3.9	3.6*
Satisf.w. social life	4.0	4.1	3.6*
Satisf w. living arr.	4.4	4.4	4.2
Present adjustment	7.8	8.3	8.4*

Krause et al., J Spinal Cord Med 2006, 374

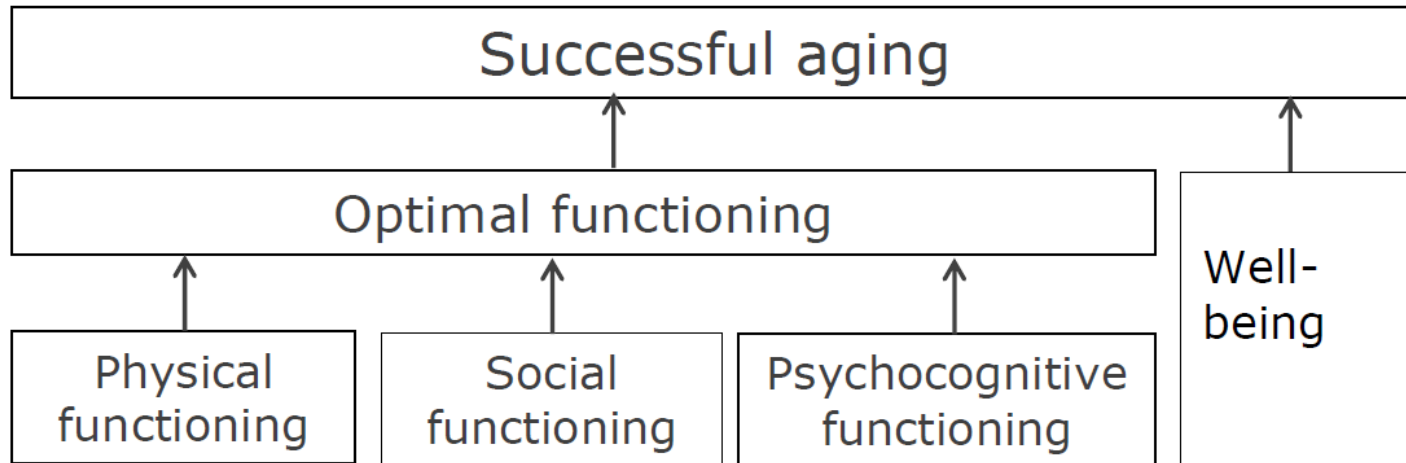
# **Successful aging**

# Successful Aging

- A state wherein an individual is able to invoke adaptive psychological and social mechanisms
- To compensate for physiological limitations
- to achieve a sense of well-being, high self-assessed quality of life, and a sense of personal fulfillment
- Even in the context of illness and disability

Young et al., J Am Med Dir Ass 2013

# Leiden elderly study



- 13% satisfied criteria for optimal overall functioning
- 45% had optimal scores for well-being
- Elderly people viewed success as a process of adaptation rather than a state of being

Von Faber et al., Arch Int Med 2001

# Determinants successful aging

- Genes and other hardware
  - Family studies, genetic studies
- Biological processes
  - Stress, inflammation
- Psychological factors
  - Resources, adaptation
- Social/environmental
  - Socioeconomic status, living conditions, support
- Lifestyle factors
  - Physical activity, smoking, drinking, etc

Depp et al. Ann Rev Clin Psychol 2010

# Interventions to enhance SA

- Physical activity
  - Physical, emotional, cognitive health
- Diet/caloric restriction
  - Cardiovascular, neuroprotective
- Cognitive stimulation, training, engagement
  - Magnitude and generalizability of effect?
- Social interventions

Depp et al. Ann Rev Clin Psychol 2010

# Challenges for SCI rehabilitation

- Losses and changes associated with aging may require individuals with SCI to:
  - change their view of themselves
  - adapt to disability
  - have built a new identity
- Unsuccessful adaptation may result in:
  - anger - especially if the deterioration is a complication of a medical or surgical procedure
  - difficulty accepting the new situation
  - grief attached to further losses

# Life-long perspective

- Rehab prepares clients for discharge, little whole of life planning is done.
- Planning for the future can assist people to think about:
  - the longer term consequences of their injury,
  - the likelihood of second injury
- People may be assisted to plan for their future by:
  - Taking a longer-term view of their equipment, medical and care needs.
  - Assisting with long-term self-identity and relationship issues



# Conclusion

- Aging is of growing importance in SCI rehabilitation and research
- SCI is an example of premature aging
- There is a need for
  - Longitudinal studies
  - Comparisons with the general population
  - In-depth studies of the aging and adaptation processes
- Taking a longer term view in rehabilitation may improve long-term health and QOL