# Exercise and Secondary Conditions among Adults with Spinal Cord Injury

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  - Independent Living Research Utilization
- Study participants

# Background

- People with disabilities, in general, are less likely to be physically active as compared to people without disabilities (Heath & Fentem, 1997)
- The majority of adults with physical disabilities live a sedentary lifestyle (Amosun, Mutimura, & Frantz, 2005; Ebrahim, Wannamethee, Whincup, Walker, Shaper, 2000; Hofoss, 2004)

# Background

- Reasons for physical inactivity:
  - mobility limitations
  - lack of transportation
  - poor accessibility of fitness facilities, health clubs, & equipment
  - information-related barriers (e.g., not knowing where to exercise)
  - lack of resources (e.g., cost of the exercise program)

Ref: Rimmer, et al., 2005; Rimmer, et al., 2004; Rimmer, et al., 2000; Stuifbergen & Roberts, 1997; Washburn & Hedrick, 1997

# Background

- People with SCI are at risk for a variety of secondary conditions resulting from the sedentary lifestyle often associated with disability (Case, 2004; Sable & Gravink, 1999).
- Consequences of secondary conditions
  - Increasing health care costs
    - The annual cost of treating pressure sores alone was estimated at $1.2 billion (Byrne & Salzberg, 1996).
  - Loss of productivity (time missed from work or school)
  - Delayed community reintegration
  - Reduced quality of life (Lucke, 1999)

# Research Questions

- Of adults with SCI, are there significant differences in the incidence of secondary conditions between exercisers and non-exercisers?
- How does exercise contribute to the decreased risks of secondary conditions in adults with SCI?

# Methods

- Cross-sectional design
- Self-reported mail survey
- Adults (≥18 years old) with a SCI for at least 1 year, living in U.S.
- Snowball sampling
- Analysis
  - Descriptive
  - Independent t-test & chi-square statistics
  - Multiple logistic regression

# Sample Characteristics (n=355)

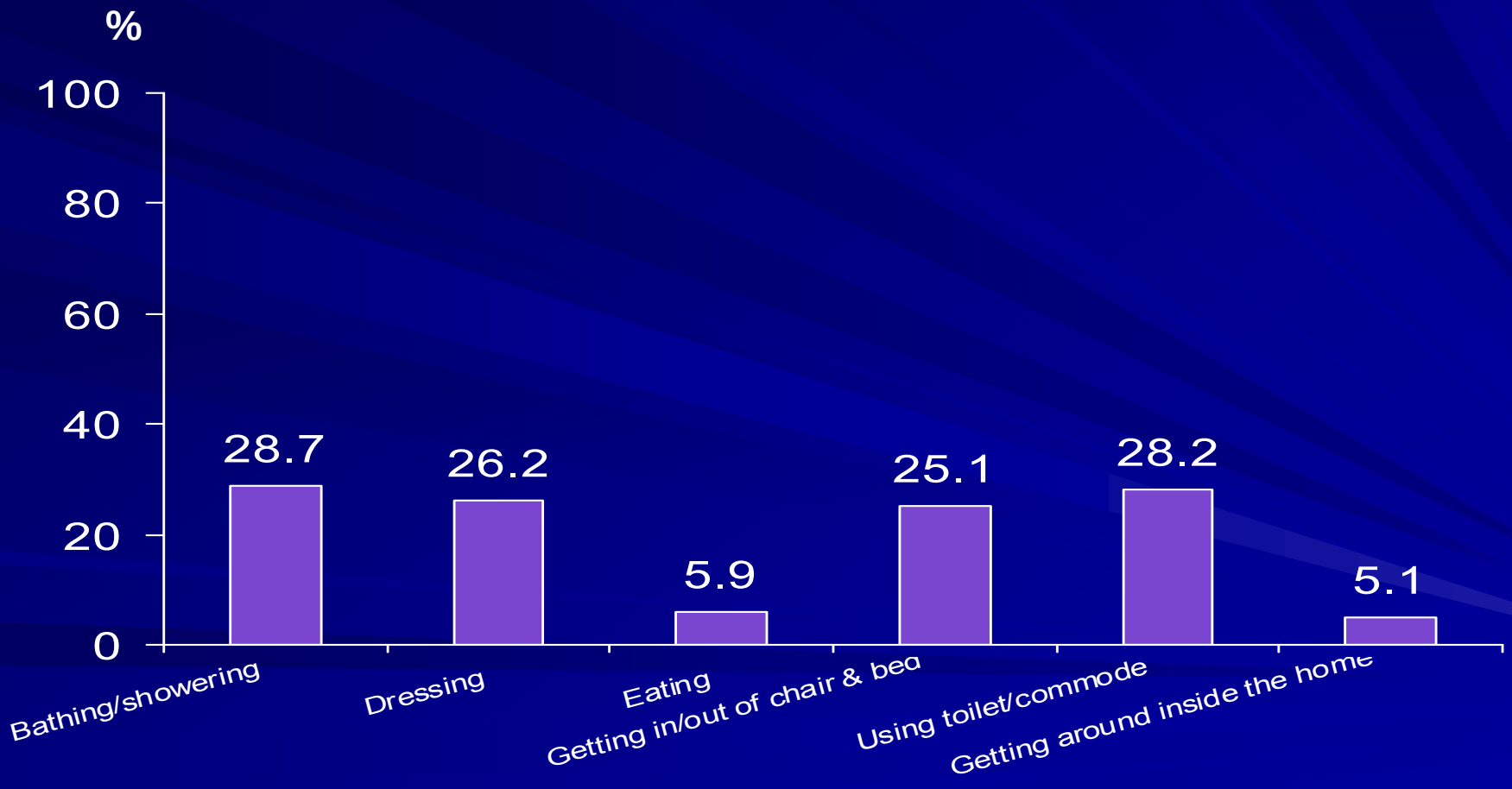
| | | |
|---|---|---|
| Male | | 59.4% |
| Hispanic origin | | 5.1 |
| White race | | 87.9 |
| Married/living with a partner | | 50.7 |
| Some college/college graduates | | 49.0 |
| Average age (year) | 46.4 | 12.6 |
| Average age at injury (year) | 31.6 | 14.2 |
| Average years since injury | 15.7 | 12.0 |

# Sample Characteristics (Cont.)

- Injury level
  - Cervical 46.8%
  - Thoracic 40.0
  - Lumbar 7.6
  - Sacral 0.3
  - Unknown 5.3
- Incomplete SCI 53.2
- Wheelchair users 86.8
  - Power 34.7
  - Manual 65.3

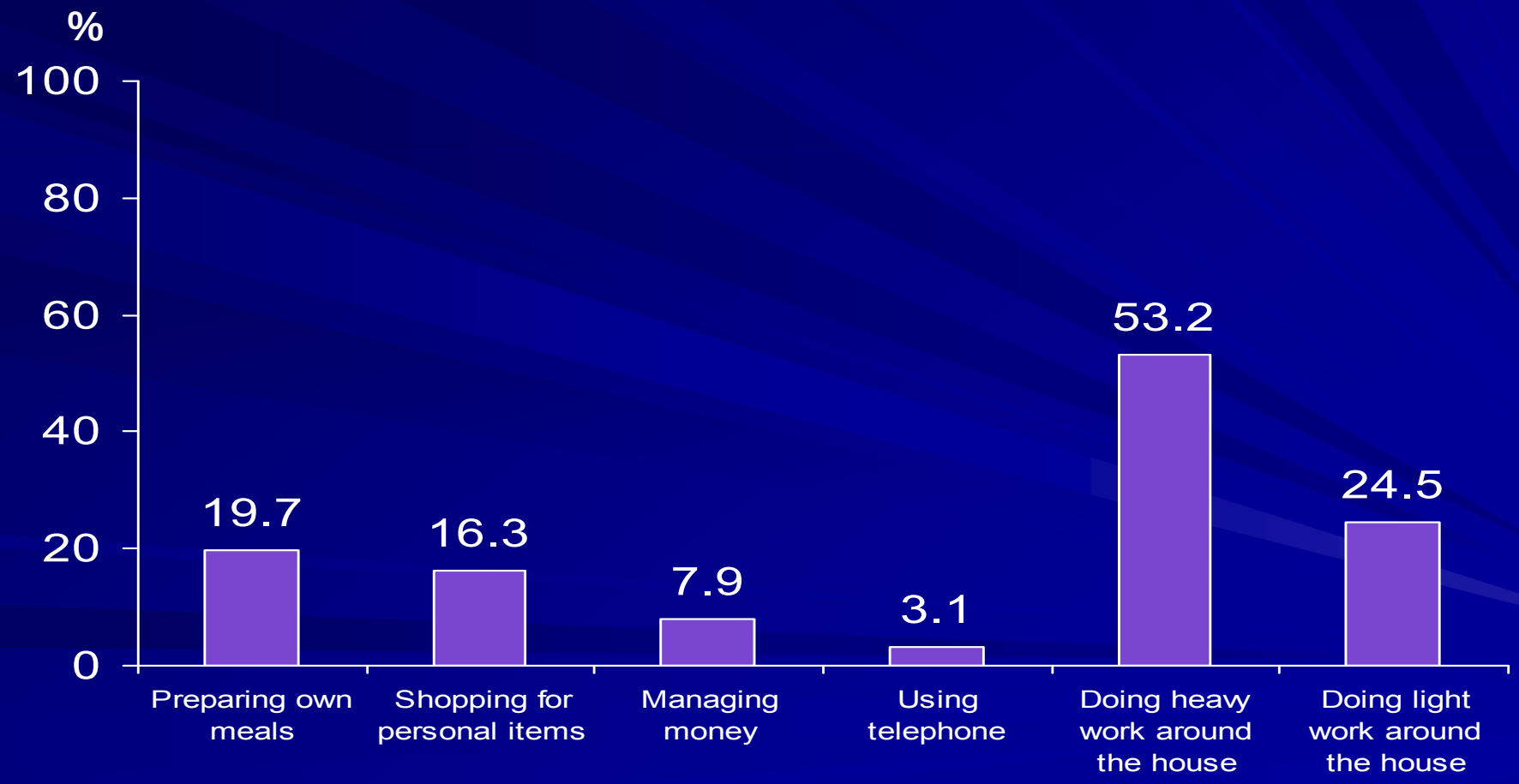
# Functional Conditions

- Need help with … ‘all the time’

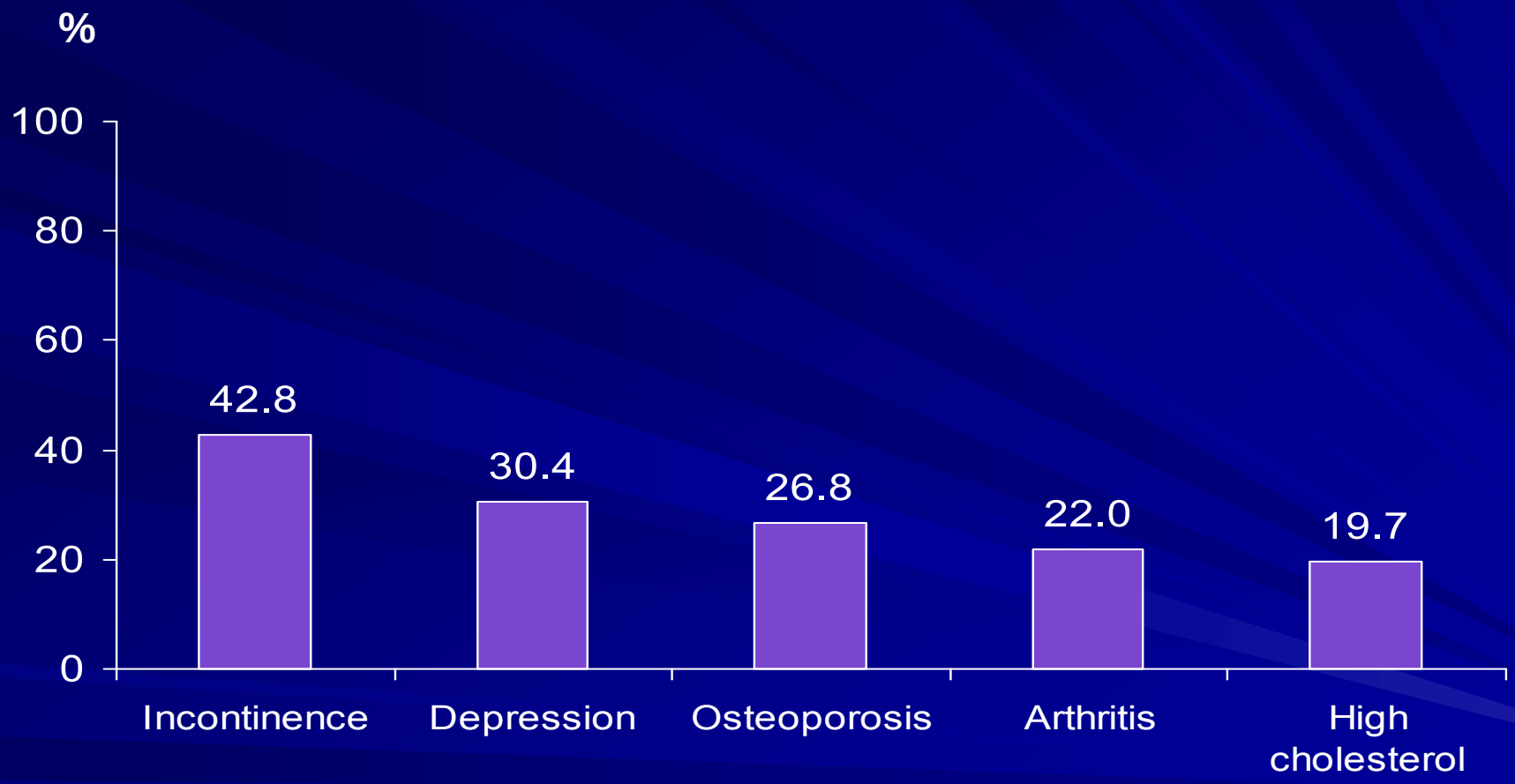


# Functional Conditions (Cont.)

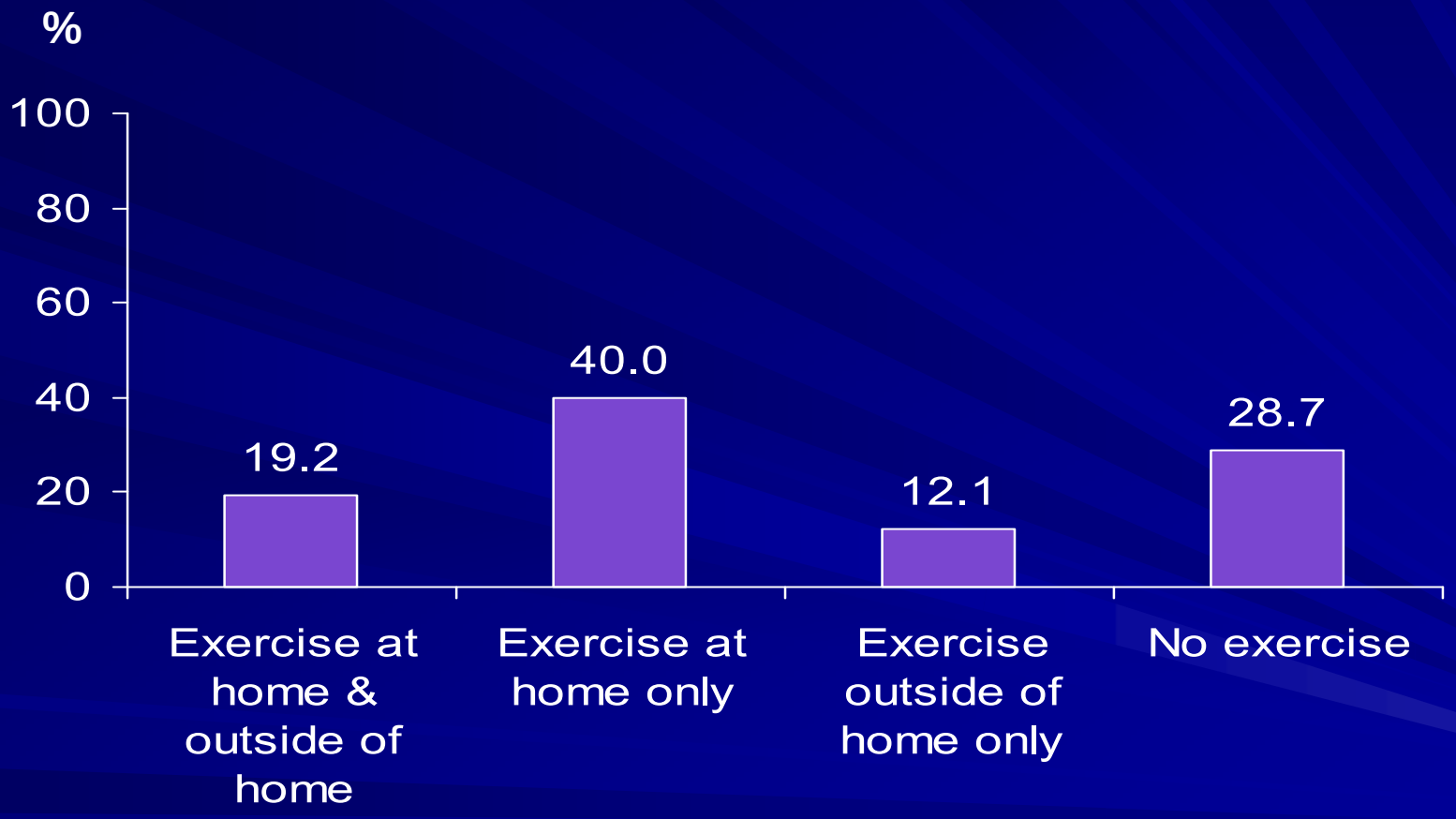
- Need help with … ‘all the time‘



# Top Five Chronic Conditions



# Exercise Activities



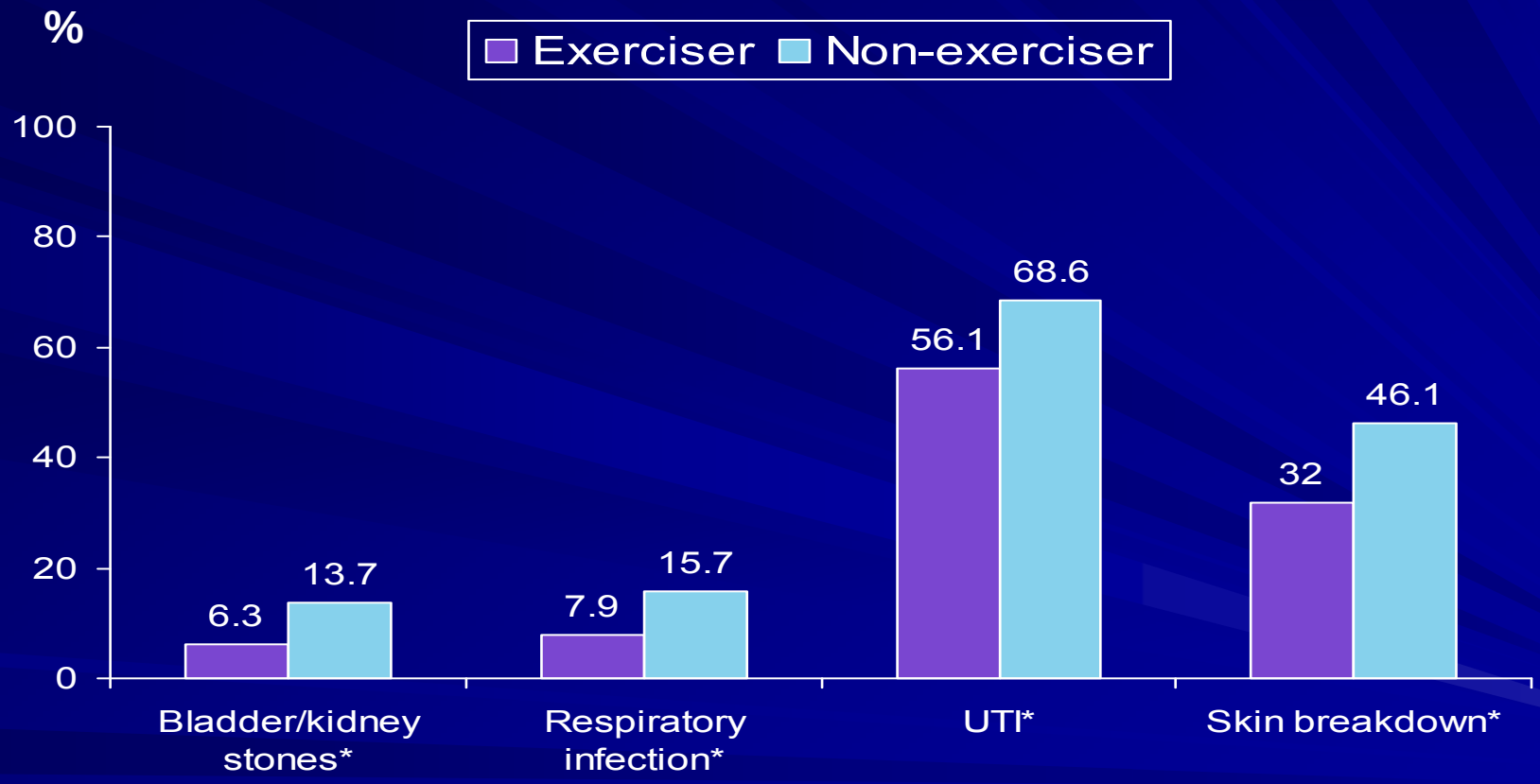
# Physical/Exercise Activities

- Aerobic activities
  - Arm/hand/leg cycling, walking/wheeling around, aerobic exercise, swimming/pool therapy
- Strengthening activities
  - Weight lifting, resistance training
- Flexibility activities
  - Stretching, standing (with walker/braces), rang of motion (legs/arms)

# Major Reasons for not Exercising

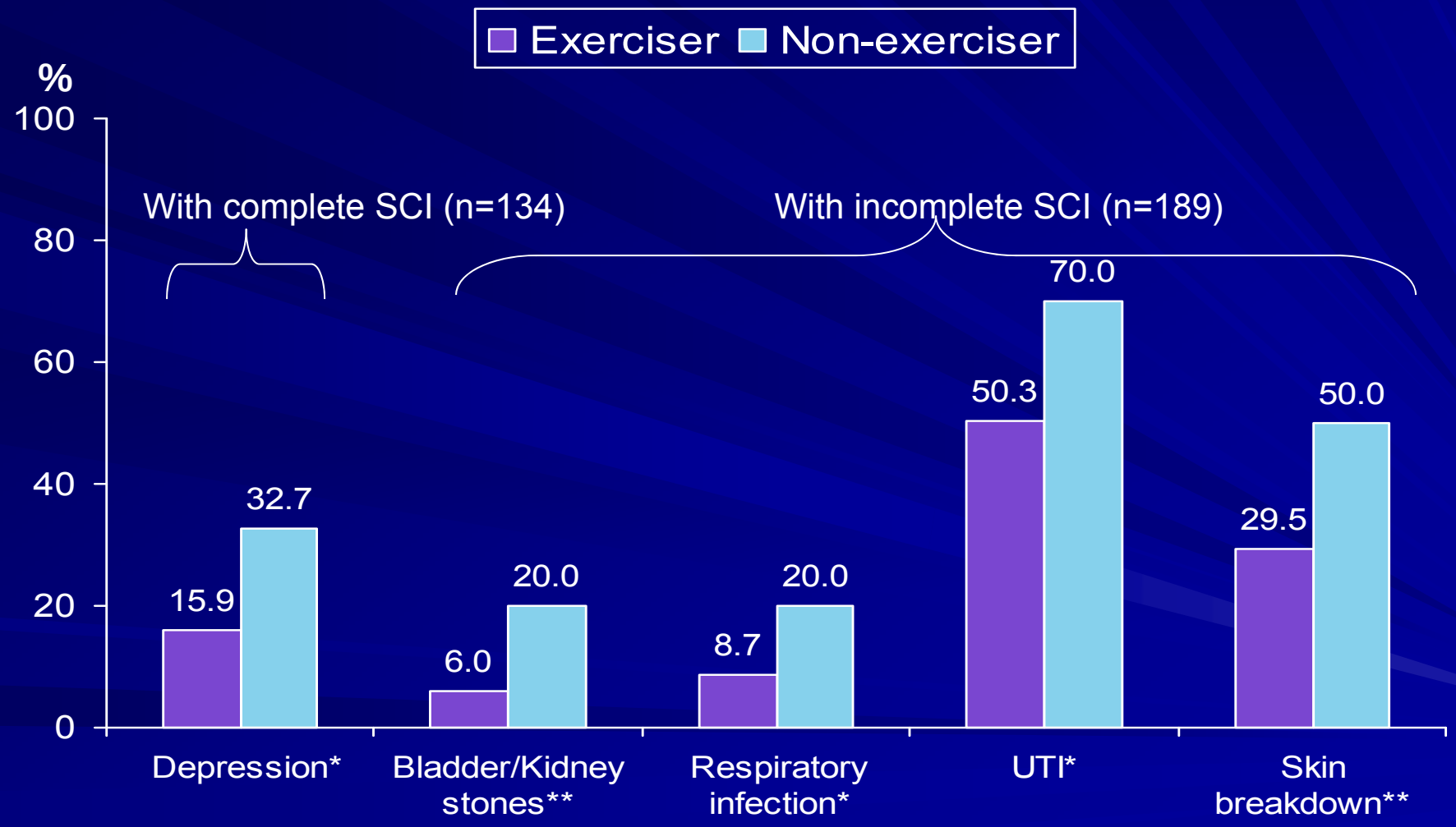
- Reasons for not exercising at home
  - Accessibility (lack of money, equipment, personal help, & time)
  - Physical conditions (pain, functional limitations, fatigue, lack of motivation or energy)
  - Other choices (gardening, wheeling, physical activities, exercising in gyms or schools)
- Reasons for not exercising outside the home
  - Accessibility (cost, inconvenience, transportation, equipment, facility)

# Are there significant differences in the incidence of secondary conditions between exercisers and non-exercisers?




* p ≤ 0.05
*** p ≤ 0.001

# Secondary Conditions & Exercise by Severity Level

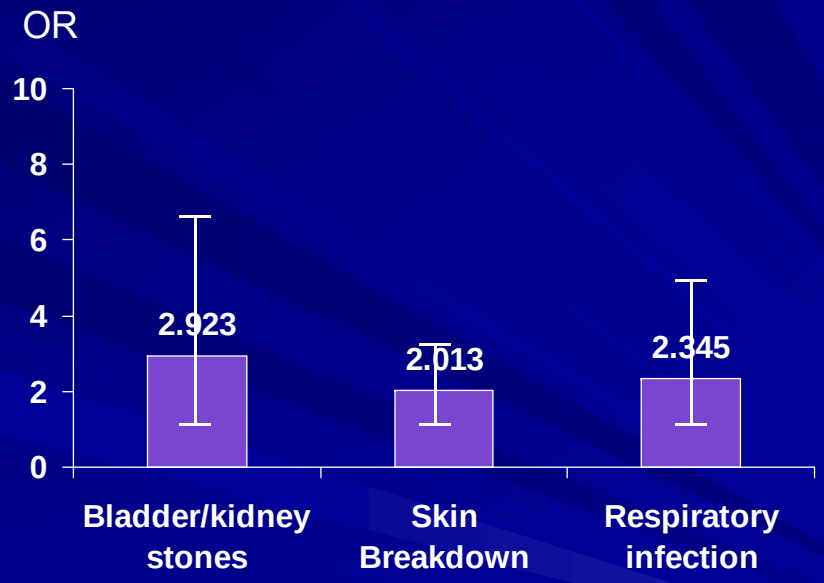



*p ≤ 0.05

** ≤ p 0.01

# How does exercise contribute to the decreased risks of secondary conditions?

- Non-exercisers had increased risks of …
  - Bladder or kidney stones OR=2.923 (p=0.008; 95% CI: 1.315-6.498)
  - Skin breakdown OR= 2.013 (p=0.007; 95% CI: 1.214-3.337)
  - Respiratory infection OR=2.345 (p=0.028; 95% CI: 1.097-5.014)




* Controlling for gender, race, education, age at injury, completeness & level of injury, exercise frequency/duration

# Conclusions

- Incidence of secondary conditions is significantly lower in exercisers than in non-exercisers among adults with SCI, particularly for those with incomplete SCI
- Exercise is associated with the decreased risks of secondary conditions in adults with SCI regardless of their socio-demographics, injury level/severity, & frequency/duration of exercise activities
- Accessibility is the common barrier for adults with SCI to engage in various types of exercises

# Implications

- Adults with SCI can benefit greatly by participating in exercise activities, but those benefits can be enhanced by
  - removing accessibility-related barriers
  - providing structured exercise activities that are appropriate for their physical capacity
- Longitudinal data are needed
  - to ascertain the causal relationship between exercise & secondary conditions

# Implications (Cont.)

- The relationship between exercise & secondary conditions among adults with complete SCI can be further studied using a larger/representative sample & longitudinal data