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Track 8: Clinical Geriatrics

Randomized Controlled Trial of a Prehospital Decision System by Emergency Medical Services to Ensure Optimal Treatment for Older Adults in Sweden

Randomized Controlled Trial of a Prehospital Decision System by Emergency Medical Services to Ensure Optimal Treatment for Older Adults in Sweden

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A r c t i c O c e a n
Russia
Alaska (US)
Alaska (United States)
Beaufort Sea
Bering Sea
Greenland (Dk.)
Greenland Sea
Norwegian Sea
Barents Sea
Iceland
C a n a d a
United States
Mexico
Sweden
Finland
Norway
United Kingdom
Ireland
France
Spain
Portugal
Poland
Ukraine
Romania
Turkey
Greece
R u s s i a
K a z a k h s t a n
Mongolia
C h i n a
Japan
India
Pakistan
Afghanistan
Iran
Iraq
Saudi Arabia
Yemen
Oman
Egypt
Libya
Algeria
Morocco
Mauritania
Mali
Niger
Chad
Sudan
Ethiopia
Somalia
Kenya
Nigeria
Cameroon
Congo
Democr. Rep. of the Congo
Tanzania
Angola
Zambia
Namibia
Botswana
Zimbabwe
Mozambique
Madagascar
South Africa
B r a z i l
Peru
Colombia
Venezuela
Bolivia
Paraguay
Argentina
Chile
Uruguay
Caribbean Sea
Philippines
Papua New Guinea
A u s t r a l i a
New Zealand
Tasman Sea
Coral Sea
East China Sea
Sea of Ochotsk
P A C I F I C
O C E A N
A T L A N T I C
O C E A N
I N D I A N
O C E A N
Arabian Sea
Bay of Bengal
Mediterranean Sea
Black Sea
Red Sea
Weddell Sea
A n t a r c t i c a
Tropic of Cancer
Tropic of Capricorn
Equator
Arctic Circle
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Sweden, Stockholm

- Sweden ~ 9 million habitants
- Stockholm ~ 2 million habitants
- Old residents *(≥ 65 years or older)* are ~ 300 000

  → 2060 estimated that the elderly population (≥65years or older) will increase by 56%



Central Bureau of Statistics. Population statistics of different age groups in Sweden, 2012.

Health services in Stockholm

- 650 000 visits to emergency departments (ED) *(year 2012)*
  - → Approximately 30% patients were admitted acute inpatient
  - → 20% of acute visits were patients ≥ 65 years or older

- Year 2006 almost 70% of the elderly population had been treated and hospitalized for at least 1 time

Ambulanssjukvården i Stockholm (AISAB) - Kvalitetsmål 2009.

Samaras et al. Annals of Emergency Medicine 2010.

Emergency Medical Services (EMS) in Stockholm

- Today we have 70 ambulances to serve 2 million inhabitants

- 186 000 ambulance assignments *(year 2013)*

  →52% of these assignments were patients from aged 65 years or older



Central Bureau of Statistics. Population statistics of different age groups in Sweden, 2012.
Ambulanssjukvården i Stockholm (AISAB) - Kvalitetsmål 2009.

How does the ambulance work

Before the Prehospital ambulance study almost all (98%) ambulance patients were transported directly to the ED



Consequences

- Low priority of geriatric patients
- Increased suffering For the patient
- Overcrowded ED is correlated to higher mortality



Sprivulis et al. Medicine Journal Australia, 2006.
Ross et al. Ann Emergency Medicine, 2003.
Fatovich & Hirsch. Emergency Medicine Journal, 2003.

Problem

- When they don't get specific medical care adjust to there needs

Our solution

- Prehospital steering of elderly patient to optimal level of healthcare



Prehospital steering of elderly patient

- Limited ability to predict the patients medical need
- Unable to determine patients need of transport
- Poor agreement between predicted triage and actual disposition or diagnosis



Levine et al. Journal Emergency Medicine, 2006.
Pointer et al. Ann Emergency Medicine, 2001.
Snooks et al. Emergency Medicine Journal, 2004.
Schumacher. American Journal Emergency Medicine´, 2005

Prehospital steering to optimal level of health care

- Higher education
- Guidelines (Decision system)
- Protocol (Decision support tool)

Levine et al. Journal Emergency Medicine, 2006.
Pointer et al. Ann Emergency Medicine, 2001.
Snooks et al. Emergency Medicine Journal, 2004.
Schumacher. American Journal Emergency Medicine´, 2005

Prehospital Study

Aim

The aim of this study was to evaluate the feasibility and appropriateness of a pre-hospital decision system and an associated decision support tool that ambulance nurses use to triage older adults to optimal level of Healthcare.

Method

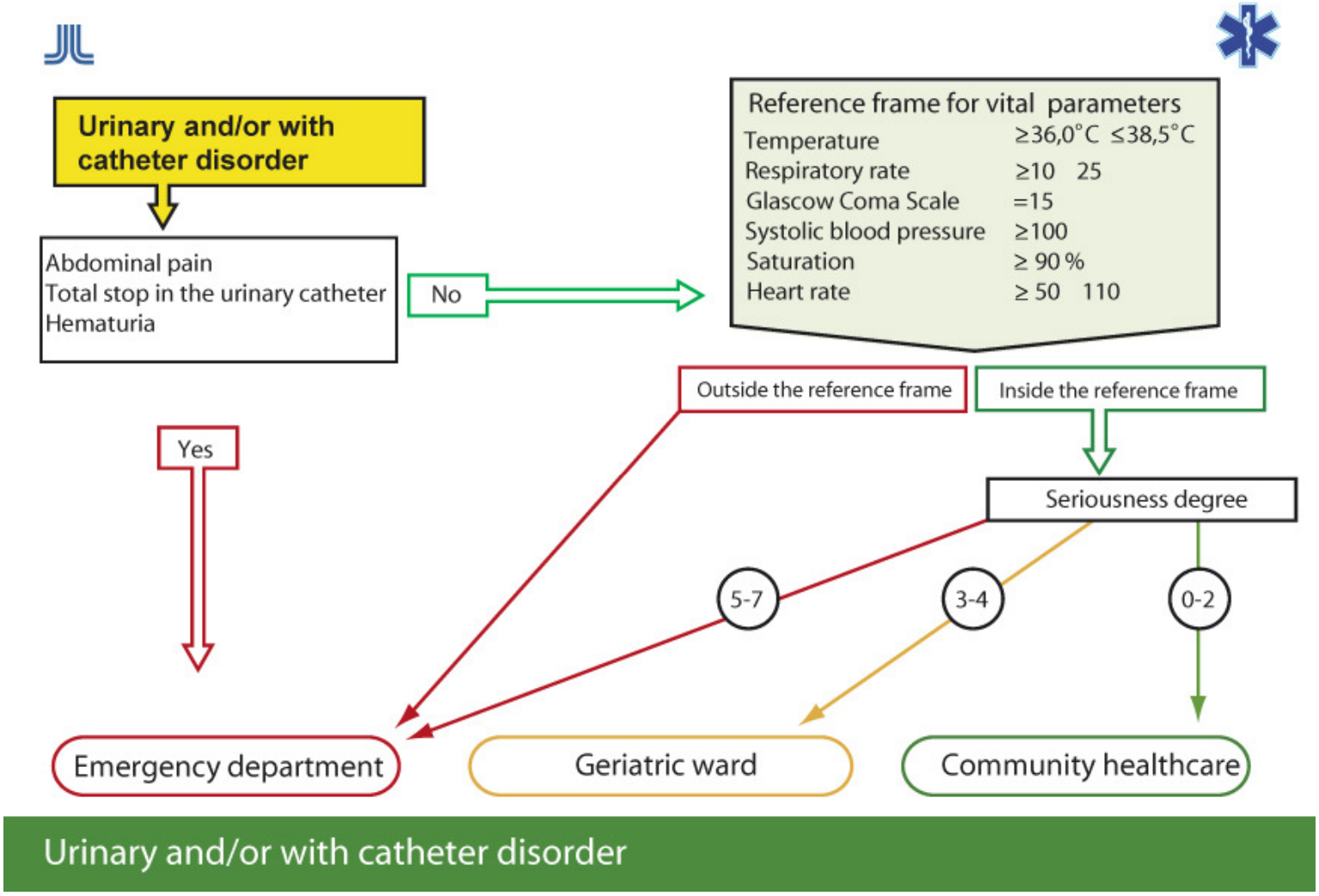
Randomized controlled trial

Appropriate patient categories to triage to alternative level of healthcare

- Urinary and/or with catheter disorders,
- Dizziness,
- Respiratory Disorders/Chronic Obstructive Pulmonary Disease COPD,
- Respiratory Disorders/Pneumonia,
- Diabetes (excluding hypoglycaemia),
- Fever,
- Hypotension,
- Frailty,
- Back pain/back contusion,
- Fall/injury and accident,
- Hip Trauma (without suspicion of femur fracture).

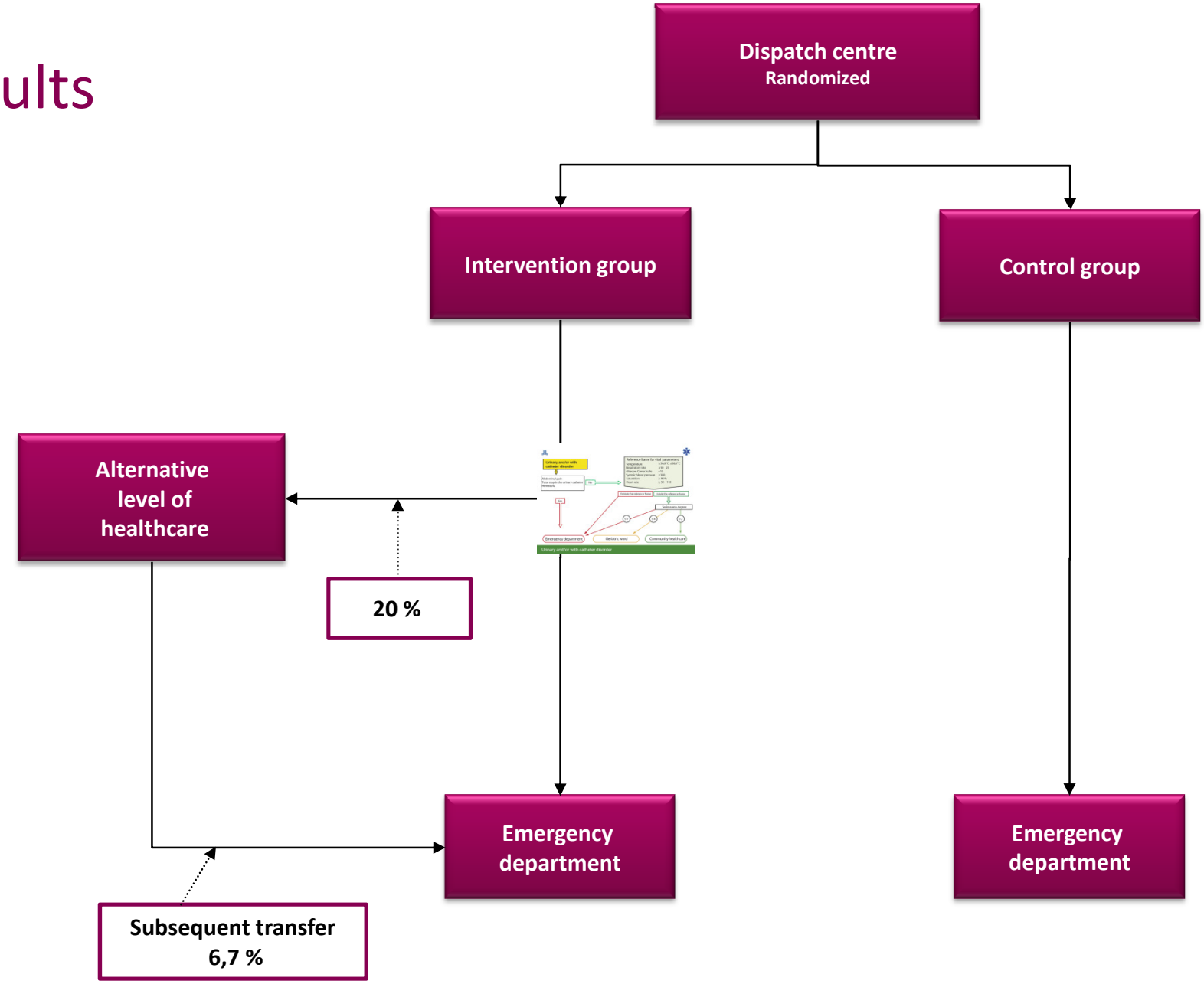
Vicente et al. European Journal of Emergency Medicine, 2012.

Prehospital decision support tool (triage tool)



Vicente et al. European Journal of Emergency Medicine, 2012.

Results


Dispatch centre
Randomized
Intervention group
Control group
Alternative level of healthcare
20 %
Emergency department
Emergency department
Subsequent transfer
6,7 %

Ambulance nurse adherence to the system

- Good compliance to the system
  - →Correctly identified patients' medical conditions in all patient cases
  - →Decisions system was followed in 93.3% (419 of 449)

The over all benefits of ambulance steering

- More adequate care for elderly patients
- Proper allocation of health care resources
- To better use the higher competence within the ambulance

Vicente et al. Journal of the American geriatric society 2014

Vicente et al. International Journal of Qualitative Studies on Health and Well-being, 2013.

Conclusion

- Ambulance nurses are able to triage older adults to an alternative healthcare with the help of a pre-hospital decision support system
- This system optimize resources and improve emergency care of elderly adults

Vicente et al. Journal of the American geriatric society 2014
Vicente et al. International Journal of Qualitative Studies on Health and Well-being, 2013.

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or

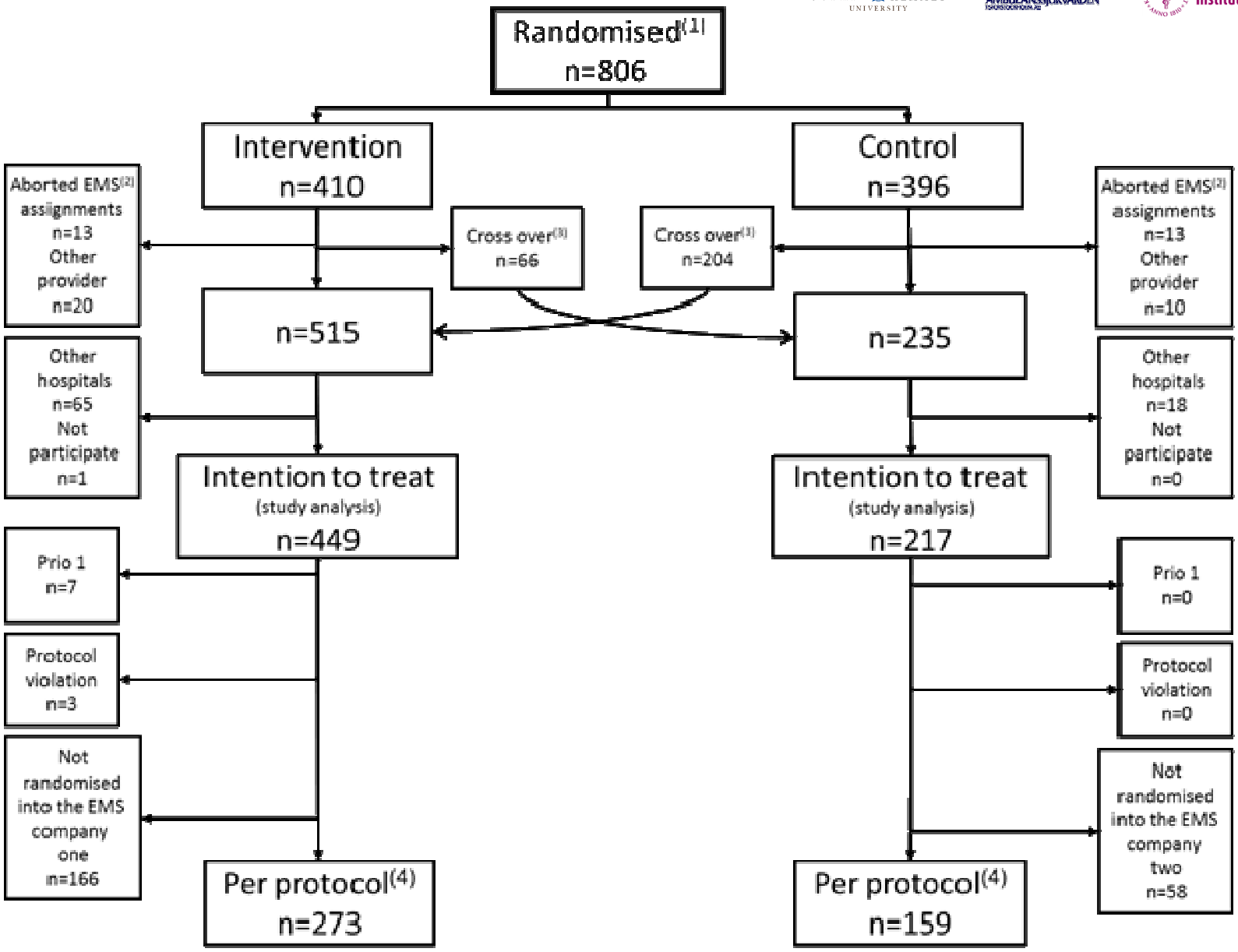
veronica.vicente@aisab.sll.se



SOPHIA HEMMET
UNIVERSITY



Karolinska Institutet


Randomised[1]
n=806
Intervention
n=410
Control
n=396
Aborted EMS[2] assignments
n=13
Other provider
n=20
Cross over[3]
n=66
Cross over[3]
n=204
Aborted EMS[2] assignments
n=13
Other provider
n=10
n=515
n=235
Other hospitals
n=65
Not participate
n=1
Other hospitals
n=18
Not participate
n=0
Intention to treat
(study analysis)
n=449
Intention to treat
(study analysis)
n=217
Prio 1
n=7
Prio 1
n=0
Protocol violation
n=3
Protocol violation
n=0
Not randomised into the EMS company one
n=166
Not randomised into the EMS company two
n=58
Per protocol[4]
n=273
Per protocol[4]
n=159

	Intervention (N=359)	Control (N=198)	*p*-value
Ambulance assignment time to Primary care	55 (16-98)		
Ambulance assignment time to Secondary care	57 (29-125)		
Ambulance assignment time to Tertiary care	54 (17-131)	55 (24-147)	0.692
Patient time in ED: Arrival - Doctor	68 (0-621)	89 (0-624)	0.024
Patient time in ED: Arrival- Discharge	262 (8-765)	288 (65-1394)	0.021

The values presented are median minutes (min-max). P-values are from the Mann-Whitney U test.

Older adults

- Multi- and/or chronic disease
- Reduction of there spare capacity
- Multi users of healthcare services



Melby et al. Journal of Clinical Nursing, 2005.
Sawatzky et al. Health and Quality of Life Outcomes, 2007.
Carret et al. BMC Health Services Research, 2007.