NIHR CLAHRC Wessex

Collaboration for Leadership in Applied Health Research and Care

University Hospital Southampton NHS
NHS Foundation Trust

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Exercise during periods of decompensation

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Conflict of interest

No conflict of interest to declare

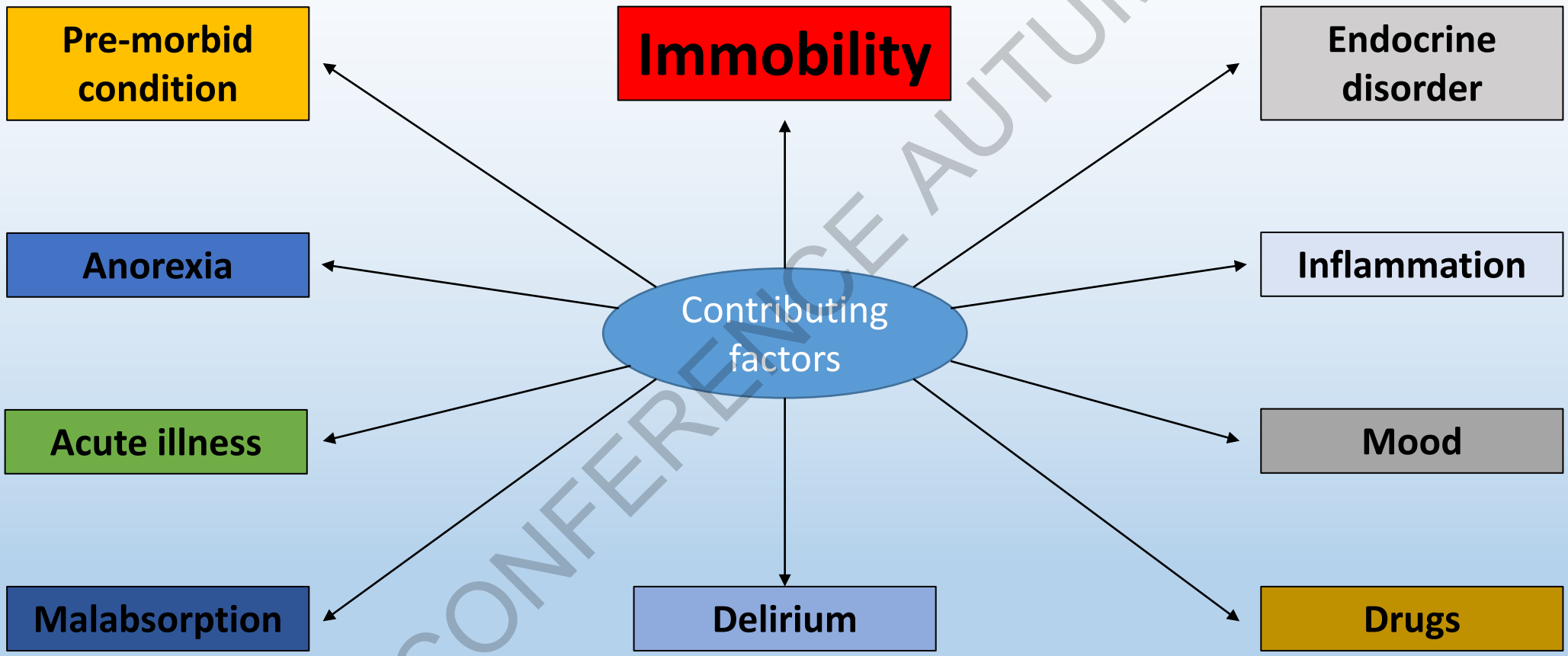
Outline

- Sarcopenia during acute illness
- Evidence regarding exercise among older people in hospital
- Southampton Mobility Volunteer study (SoMoVe)

Sarcopenia during acute illness

- Rapid loss of muscle mass and strength primarily a result of
  - excessive protein break down, and
  - reduced protein synthesis
- Hospitalisation: Physical inactivity & anorexia
- Progression of sarcopenia may be accelerated by physical inactivity and poor nutrition

Contributing factors to accelerated loss of muscle mass and strength



Immobility in hospital

- Median time in upright position 43min per day (mean age 74 years) (Brown 2009)

- Median daily step count 590 steps (Age > 75 years) (Fisher 2011)
- Median daily step count ranged from (229 – 661) (McCullagh 2016)

Impact of immobility

- Kortebein (2007) 10 days bed rest - 1.5kg of whole body lean mass, 1kg loss of lean leg mass among healthy older adults
- Inactivity-related loss of muscle mass predominantly affects the lower body musculature,
- most rapid during the initial days/weeks of inactivity
- Predominantly in the ambulatory and postural muscles of lower extremities (LeBlanc 1992, Paddon-Jones, 2004)

Exercise during periods of decompensation

- What is the current evidence for older medical inpatients?

Exercise for acutely hospitalised older medical patients (de Morton et al, 2007)

- 7 RCTs and 2 CCTs

- 3 trials were exercise only interventions
  - Walking and exercise programme
  - Individually tailored by physiotherapists
  - Administered by physiotherapy assistant
  - Twice per day, up to 30min per session
  - Commenced within 2-3 days of hospital admission

Exercise for acutely hospitalised older medical patients (de Morton et al, 2007)

- 6 trials MDT interventions that included exercise
  - Increased medical and/or nursing care
  - Additional exercise administered or supervised by:
    - Nursing staff or therapists
    - Care givers
    - Within 3 days of admission
    - Frequency, duration, repetition less well-described
    - Intervention for 2 trials: walk or stand 3 times per day and a daily walk to the activity room for exercises

Findings

MDI + exercise	Pooled analysis
Length of stay	**WMD: -1.08 (95% CI -1.93, -0.22)**
Discharge home	**RR: 1.08 (95% CI 1.03, 1.14)**
Activities of Daily Living	RR: 1.07 (95% CI 1.00, 1.13)
Exercise only	
Length of stay	WMD: 0.01 (95% CI -1.23 – 1.26)
Barthel Index	SMD: 0.17 (95% CI -0.06 – 0.10)

Impact of exercise/mobility programme on older medical inpatients

- Reduction in nursing home admission (Nolan 2008)
- Reduction in length of stay (Padula 2009)
- Improvement in ADL and IADL (Courtney 2009)
- Higher proportion of patients who had ≥ 10 point Barthel Index improvement (Abinzanda 2011)
- Improvement in Timed up and go test (Laver 2012)
- Maintenance of pre-hospitalisation community mobility (Brown 2016)

Key points:

- Any exercise is better than no exercise
- As early as possible!
- Lower limb exercises, mobility
- 2-3 times a day
- 25 - 45min per session
- Target intervention on patients who require supervision or assistance to ambulate

Southampton Mobility Volunteer study (SoMoVe)

- Addressing the issue of sedentary behaviour
- The role of volunteers in healthcare
  - 3 million volunteers involved in health and social care
  - 1.9 million volunteers involved in volunteering among older people
- Volunteers being involved in direct patient care
  - Eg: Mealtime assistance

- **Aim**: To explore the feasibility and acceptability of using trained volunteers to encourage older inpatients to be physically active

Volunteer recruitment and training

- Hospital voluntary services
- Study promoted during volunteer induction day
- Interested volunteers invited to the training day
- Existing volunteers were also encouraged to participate

- Half-day training day followed by competency assessment
  - Theory
  - Practice among peers
  - Competency assessment (4 hours on average)

Patient participants

3 acute medical wards in the Medicine for Older People department

Inclusion criteria

- Patients aged ≥ 70 years
- Able to mobilise prior to admission
- Able to provide valid consent

Exclusion criteria

- Patients receiving palliative care
- Infection-control

Intervention

- Twice daily volunteer-led intervention
- 15 – 20 minutes
- Weekdays
- Individualised activity prescription by therapists

- Participants who were discharged by therapy and independently mobile were encouraged to mobilise

- Participants who needed assistance in mobility were encouraged to perform bedside upper limb and lower limb exercises

- Pre – post observational study

- Outcomes
  - Volunteer recruitment, training and retention
  - Patient adherence to intervention
  - Adverse events
  - Acceptability
  - Physical activity levels
  - Receipt of care
  - Cost analysis

Volunteer recruitment

August 2016 – April 2017

- Recruited: 17 volunteers
- Trained: 16 volunteers
- Retained: 12 volunteers (71%)

Volunteer characteristics

Volunteer characteristics		N =16
Age (mean)		36.1 (SD 20.6)
Age range (years)		17 – 66
Gender	Male	4 (25%)
	Female	12 (75%)
Employment	Full time	1 (6%)
	Part time	3 (19%)
	Retired	3 (19%)
	Student	8 (50%)
Previous volunteering experience		12 (75%)
Experience in healthcare		9 (56%)

Participant characteristics

		Pre-intervention (n = 50)	Intervention (n = 50)
Age (mean)		87.2 (4.6)	86.2 (5.1)
Barthel Index (Median)		77 (54-90)	80 (58-92)
Gait speed (m/s; median)		0.55 (0.35-0.72)	0.45 (0.26-0.71)
Mini-mental state examination (Median)		25.5 (22-27)	26 (22-28)
Usual Residence	Living alone	26 (52%)	21 (42%)
	Living with friends/family	21 (42%)	27 (54%)
	Residential/Rest home	3 (6%)	1 (2%)
	Nursing home	0	1 (2%)

Results

Participant adherence to activity: 230/310 (74%)

No adverse events reported

Reason for non-adherence	Number (%)
Clinical reasons	16 (20%)
Tiredness	15 (19%)
No reason given	15 (19%)
Feeling unwell	14 (18%)
Patient wanted to rest	6 (8%)
Patient asleep	5 (6%)
Visitors	5 (6%)
Pain	3 (4%)
Going home	1 (1%)

Results

	Pre- Intervention (n = 50)	Intervention (n = 50)	P value	Difference
Median daily step count	636 (298 – 1468)	912 (295 – 1824)	0.27	+45%
Length of hospital stay	15.5	15	0.83	-0.5 days
Readmission in 1 month	30%	18%	0.16	-12%
Discharge to usual residence	70%	68%	0.82	-2%

Acceptability

Would I have done it if he had not come in? I might not have done. It's having the volunteers, they encourage you to have a go.
I think the more chances patients are given to activity, they will all get well quicker. No doubt about it. I feel good now, and I want to get home. I think mobility is a very important thing for everybody.

Patient X

Acceptability

We should have time, but we don't and that's the role the volunteers play, a very vital support role to us I think. It frees up time for us to do more critical care.

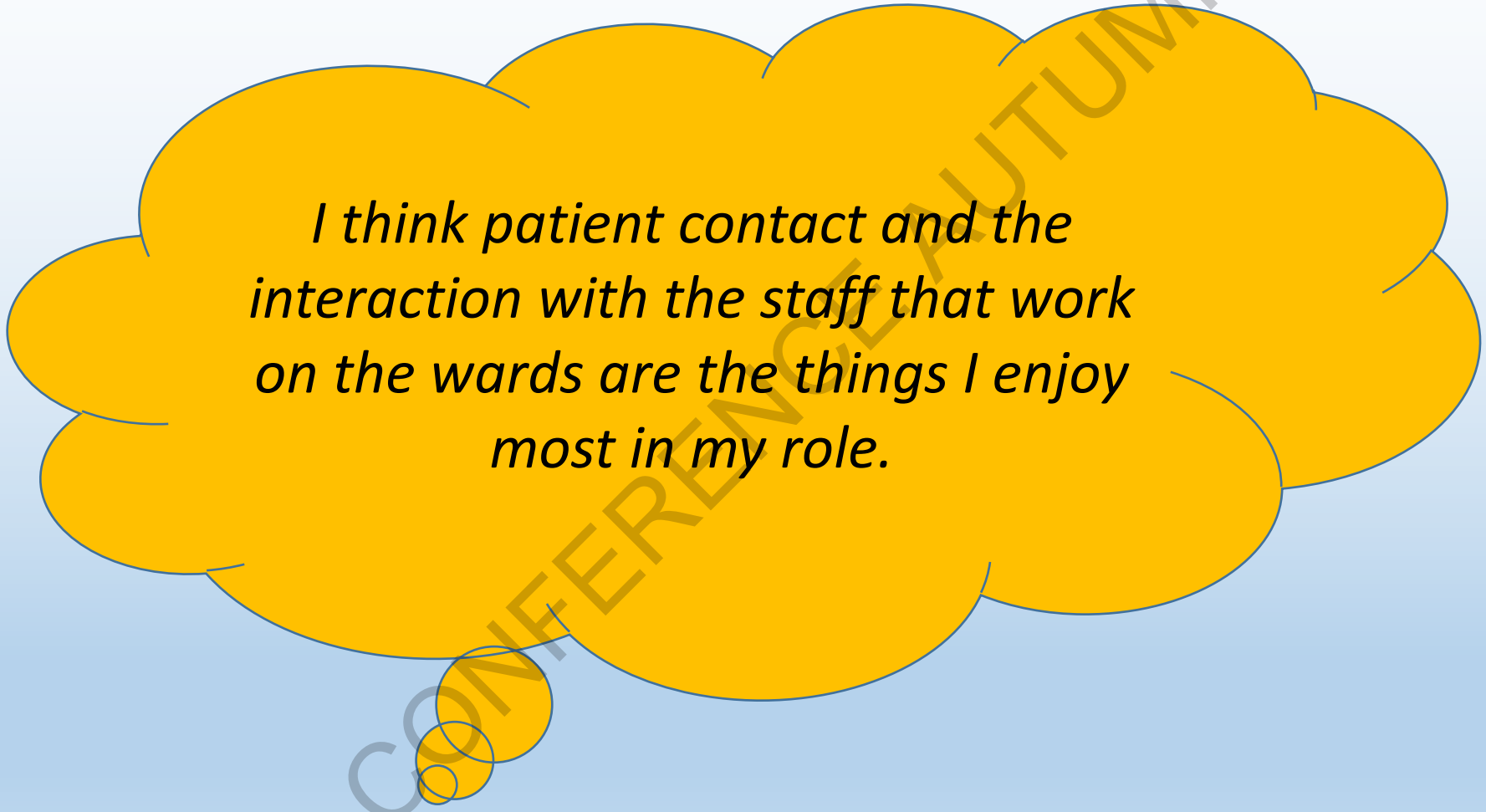
Nurse X

Acceptability

We've got a patient on ward X at the minute who said 'I love doing these exercises because I feel much more flexible since the volunteers started coming'. He rants about it all the time and he obviously likes it!

Therapist Y

Acceptability



Volunteer X

Cost analysis

- Cost of training 16 volunteers: **£4,775**
- 3 hours group training session (5 training sessions) + 4 hours of individual assessment
- Cost to train a volunteer: **£298.44**

Summary

- Feasible and safe to train volunteers to encourage older inpatients to remain active.
- Acceptable and well-received by patients, nurses and therapists
- Indications of improved physical activity, reduction in length of hospital stay and readmission rate.

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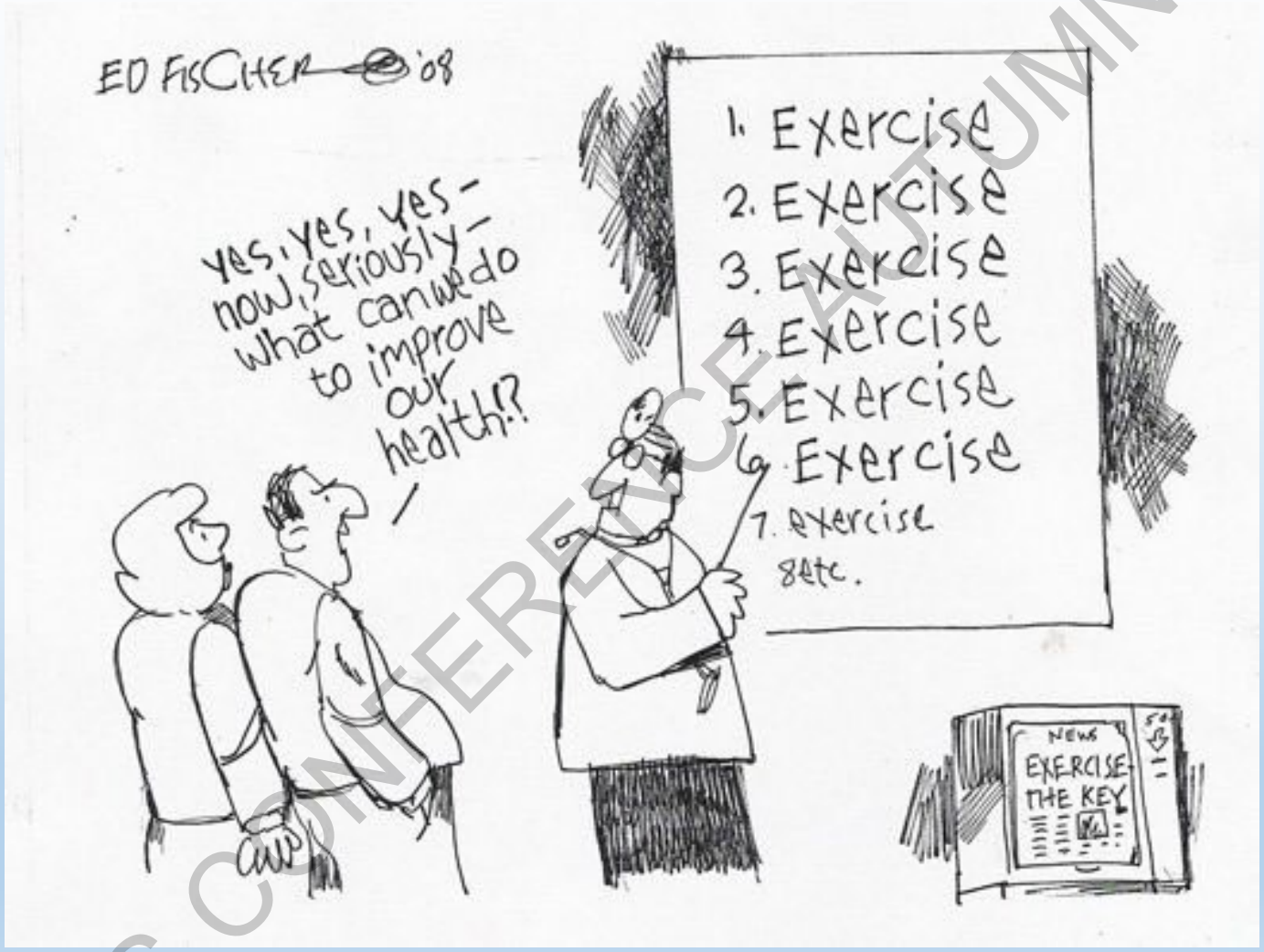
Volunteers



	Intervention	mean age (years)	Outcome measure	Findings
Nolan 2008 ; N = 196	Functional maintenance exercise, 6 x per week, 30 min	83.6	Elderly Mobility Scale, Receipt of care	**Reduction in nursing home admission.** Trend towards reduction in LOS and improved functional mobility, but not statistically significant
Courtney 2009; n = 64	Individual exercise programme, daily in hospital, + telephone follow up for 24 weeks post-discharge	78.1	ADL	**Improvement in both ADL and IADL scores**
Padula 2009; n =51	Nurse-driven mobility protocol		Receipt of care	**Reduction in length of stay**
Abinzanda 2011; n = 198	Occupational therapy, retraining in ADL, 5 days/week, 30-45min/day	83.7	Barthel Index	55.6% improved ≥ 10 BI points (36.7% in control group)
Laver 2012; n = 22	Wii Fit supervised by physio, 5 days/week, 25min/day	85.2	TUG	**Improvement in TUG**
Brown 2016; n = 100	Mobility programme + behavioural intervention	74.4	ADL, LSA	**Maintenance of pre-hospitalisation community mobility**