九龍中醫院聯網
Kowloon Central Cluster

Golden bullet trigger for old engine-sustaining benefits of 365-Day Physiotherapy(PT) Service for frail elderly with hip fracture in Kowloon Central Cluster (KCC)

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Aging Population & Hip Fracture

- Aging population (>65 years old)

Year	Population (Thousands)	Percentage
2046	2626.3 ↑	32% ↑
2016	1173.9	16%

Hong Kong Population Projection 2017-2066

- 11,081 Hip fracture headcounts under HA Hospitals in 2016
- Sig. % is elders with surgery done
- Interruption of rehab service during weekend & public holidays affects patients' continuity of care

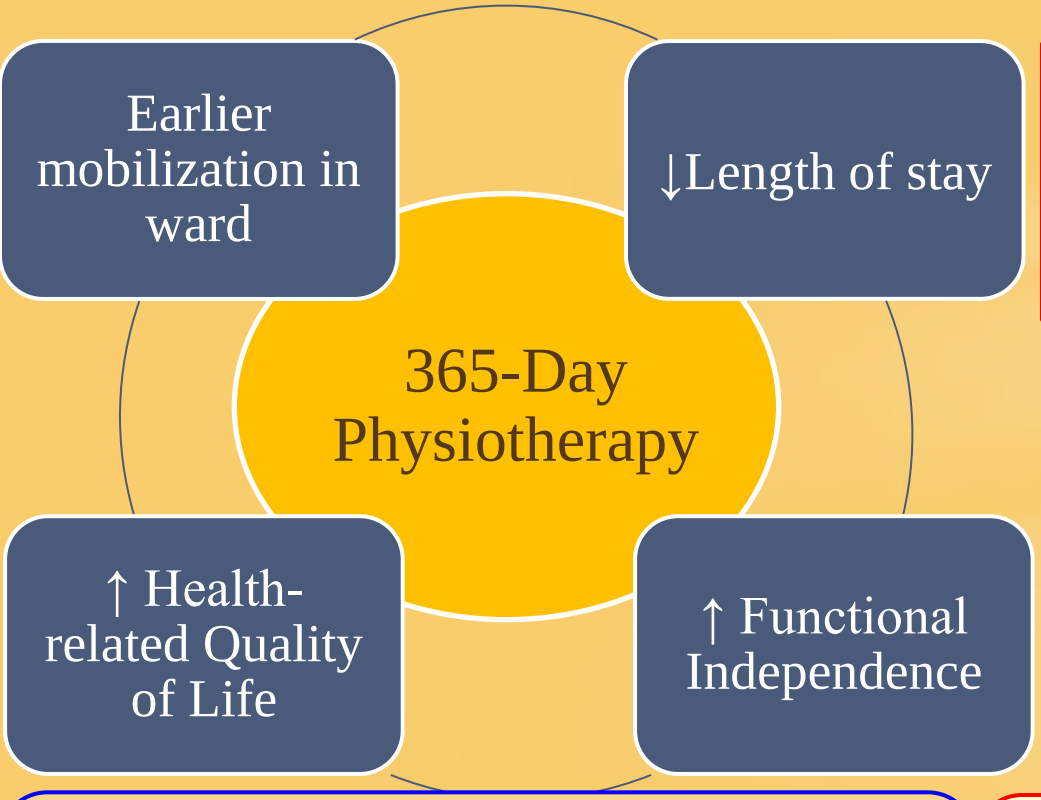
→Unnecessarily prolonging idle time for inpatient rehab

→Decreased in mobility & social interaction

→Poor functional outcomes, increase in length of hospital stay, higher chance of institutionalization after hospitalization (to be discharged to OAH (Kamel *et al.*, 2003; Oldmeadow *et al.*, 2006; Siu *et al.*, 2006)

365-day Physiotherapy Service

- Hospital Authority Strategic Service Framework for Rehabilitation Service 2016



1. Increase Service Coverage and Enhance Accessibility through a System Approach

- Expanding the coverage of AH service for inpatient rehabilitation especially on weekends and public holidays so as to speed up the rehabilitation progress and enhance service efficiency

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- Increasing day rehabilitation service to facilitate timely discharge from hospital and relieve the demand pressure on inpatient service
- Improving the access of younger patients to rehabilitation services, particularly for addressing their special rehabilitation needs as well as requirement for day rehabilitation care

Executive Summar

2. Ensure Appropriateness of Care to Meet Patients' Needs

Strategies

Stratify the patients' rehabilitation needs so as to ensure that right care is delivered to the right patient at the right time and place. It is essential to

365-day PT service for patients with lower limb fracture & arthroplasty in acute setting was implemented in Queen Elizabeth Hospital in Oct 2017

Foci of Acute 365-PT

Bed mobility training; neuromuscular workup, walking / rehab aids prescription & Gait re-education

Aim - Evaluate the sustaining benefits of 365-Day acute PT service downstream in extended care setting

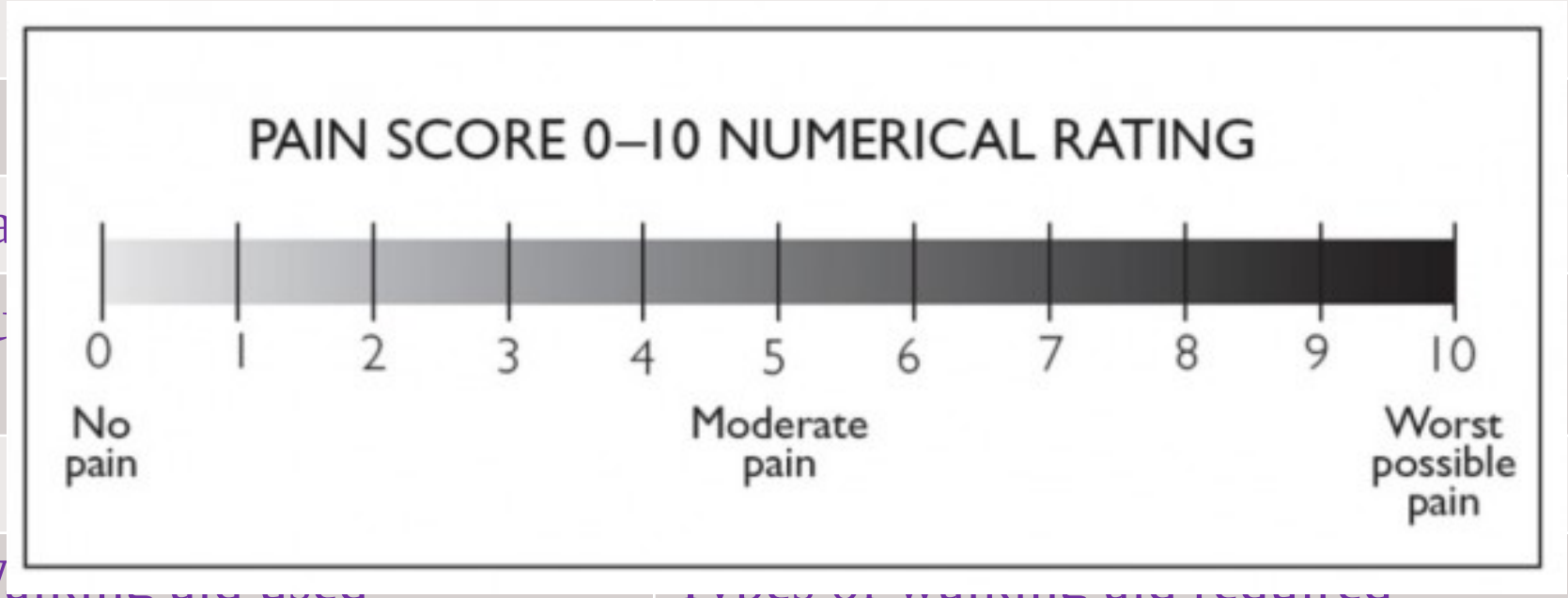
Target

- Maximize rehabilitation outcome
- Improve continuity of acute and rehabilitation services
- Facilitate patient flow, early and safe discharge

Identify potential service enhancement areas for 365-Day PT service

Methodology

Domains	Outcomes Measures
Duration of Hospitalization	LOS in QEH post surgery
Pa	
Fu	
W	Types of walking aid required
Discharge Destination	Living in home premorbid



Modified Functional Ambulation Classification (Chau et al., 2013)

Categories	Stage	Definition
I	Lyer	Patient cannot ambulate and requires manual assistance to sit, or is unable to sit for 1 minute without back or hand support, with the bed or plinth height allowing hips, knees, and ankles positioned at 90° and both feet flat on the floor.
II	Sitter	Patient is able to sit for 1 minute without back or hand support and is unable to ambulate with the help of only one person.
III	Dependent Walker	Patient requires manual contacts of no more than one person during ambulation on level surfaces to prevent falling. Manual contacts are continuous and necessary to support body weight as well as to maintain balance and/or assist coordination.
IV	Assisted Walker	Patient requires manual contacts of no more than one person during ambulation on level surfaces to prevent falling. Manual contacts are continuous or intermittent light touch is required to assist balance and/or coordination.
V	Supervised Walker	Patient can ambulate on level surfaces without manual contact of another person, but for safety reasons, he/she requires standby guarding or verbal cuing of no more than one person.
VI	Indoor Walker	Patient can transfer, turn and walk independently on level ground, but requires supervision or physical assistance to negotiate any of the following: stairs, inclines, or uneven surfaces.
VII	Outdoor Walker	Patient can ambulate independently on level and non-level surfaces, stairs, and inclines.

Good psychometric properties
- Excellent inter-rater reliability
- Good construct validity with EMS

Elderly Mobility Scale (Smith, 1994)

Lying to sitting
- 2 Independent
- 1 Needs help of 1 person
- 0 Needs help of 2+ people

Gait
- 3 Independent (incl. use of sticks)
- 2 Independent with frame
- 1 Mobile with walking aid but erratic/ unsafe turning
- 0 Requires physical assistance or constant supervision

Sitting to lying
- 2 Independent
- 1 Needs help of 1 person
- 0 Needs help of 2+ people

Timed walk
- 3 Under 15 seconds
- 2 16-30 seconds
- 1 over 30 seconds

Sit to stand
- 3 Independent in under 3 seconds
- 2 Independent in over 3 seconds
- 1 Needs help of 1 person (verbal or physical)
- 0 Needs help of 2 + people

Functional Reach
- 4 Over 20cm
- 2 10-20cm
- 0 Under 10cm or unable

Standing
- 3 Stands without support & reaches within arms length
- 2 Stands without support but needs help to reach
- 1 Stands, but requires support
- 0 Stands, only with physical support (1 person)

Support = uses upper limbs to steady self

Predictive Validity for independence in daily life

Score < 10: High level of help required

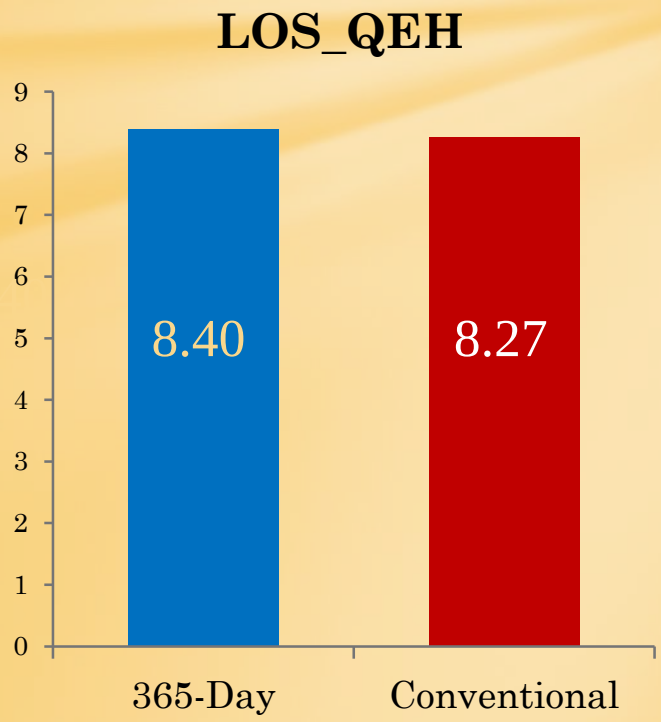
Score 10-13: Borderline safety and independence

Score ≥14: Independent community integration

(de Morton *et al.*, 2008)

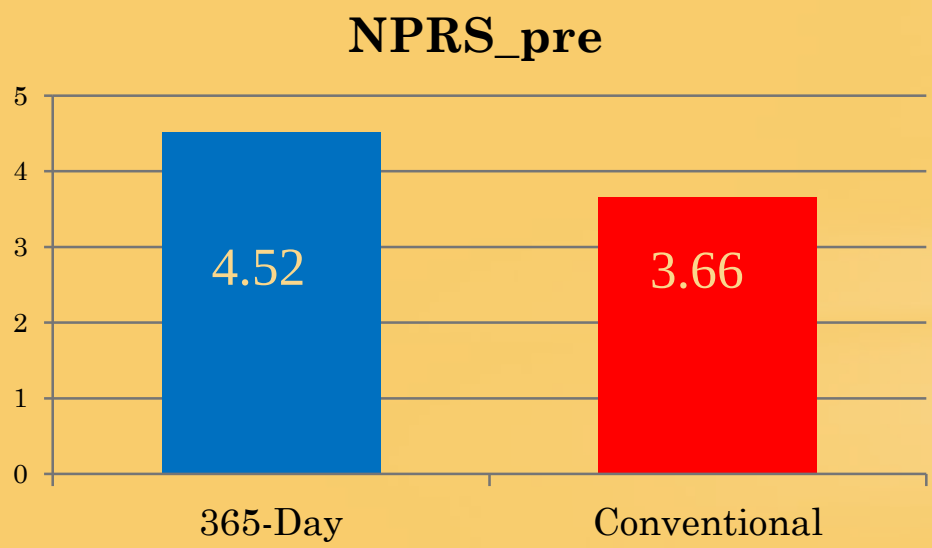
Results

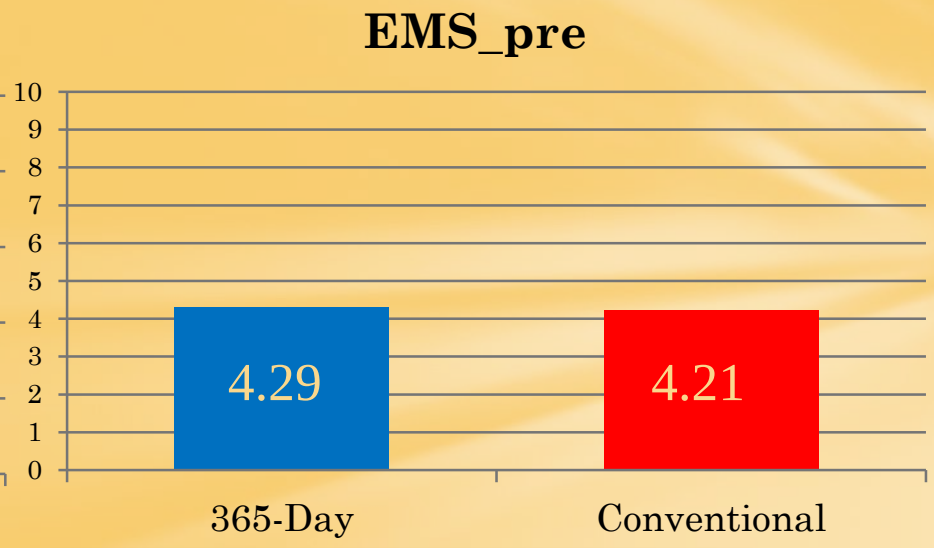
- 48 patients received 365-Day PT service were identified
  - 48 matched controlled patients (Mean age: 83.3±7.5 years old)
- Male : Female = 32.7% : 67.3%
- # NOF : # TOF = 47.9% : 52.1%
- Home premorbid = 89.6%
- LOS in QEH
  8.40±5.03 vs 8.27±3.68
  No between groups difference

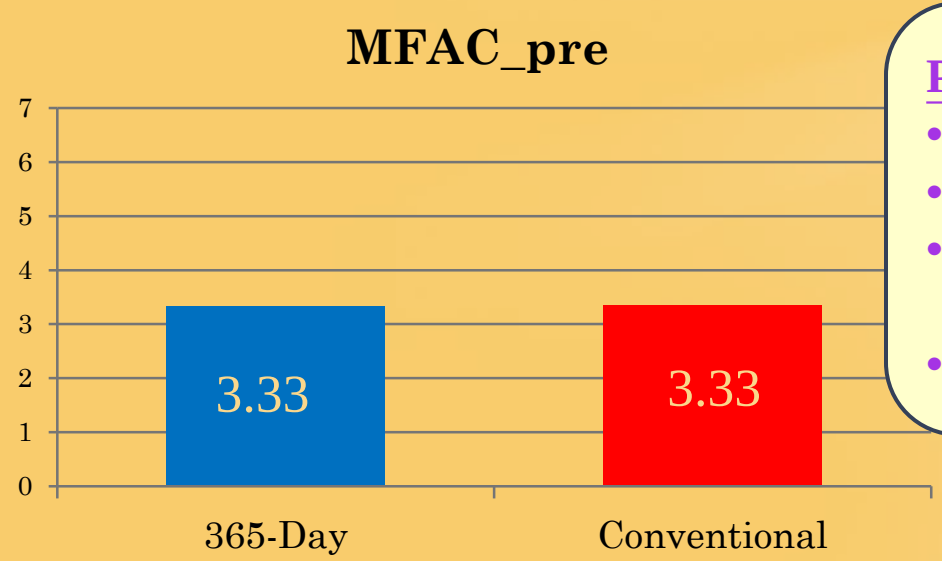


$p>0.05$

Baseline Demographic Data at Admission to KH







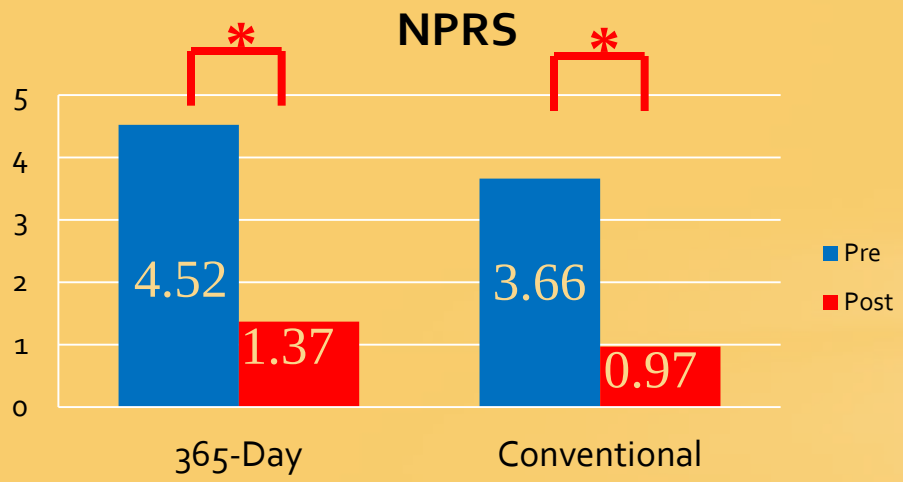
Patient Characteristics

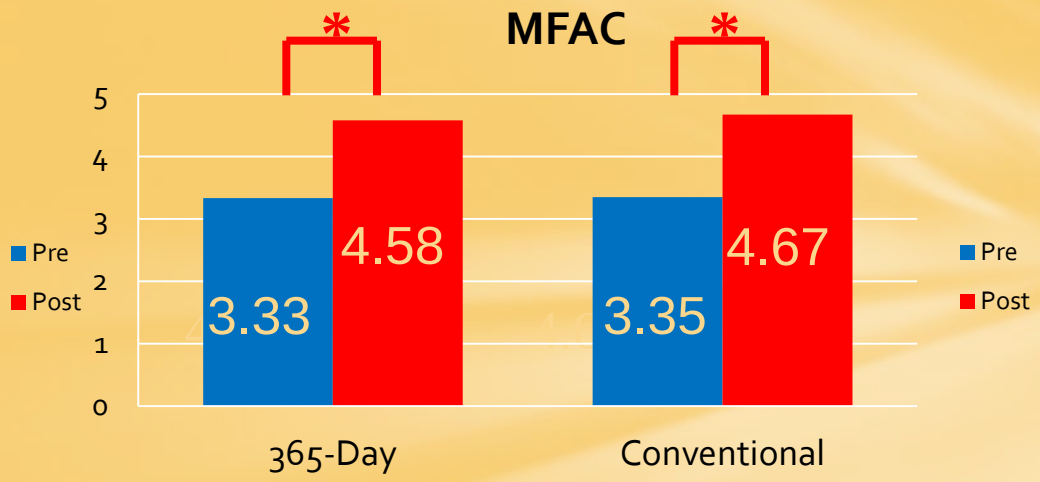
- Old-old group (>80)
- Moderate pain level
- Dependent walker (heavy manual assistance required)
- High dependence in daily task

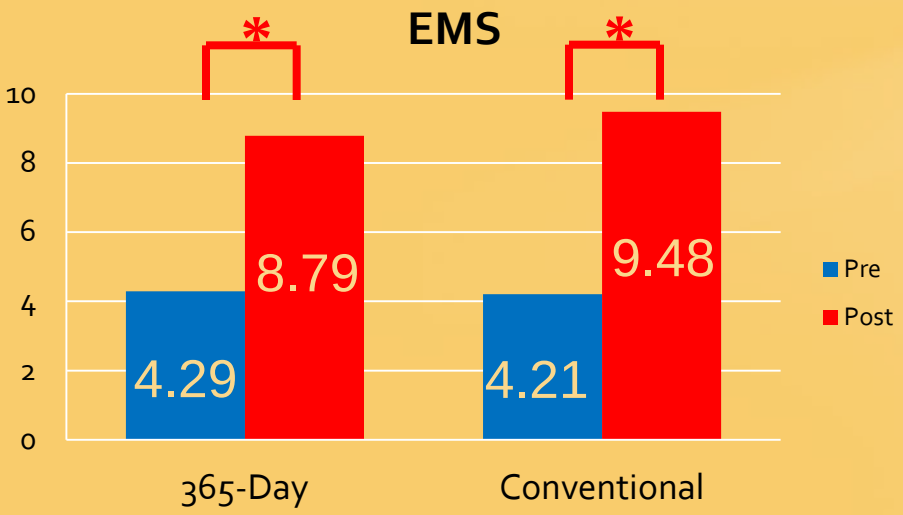
$p>0.05$

No between groups difference at baseline

Physical Status at Pre-discharge from KH







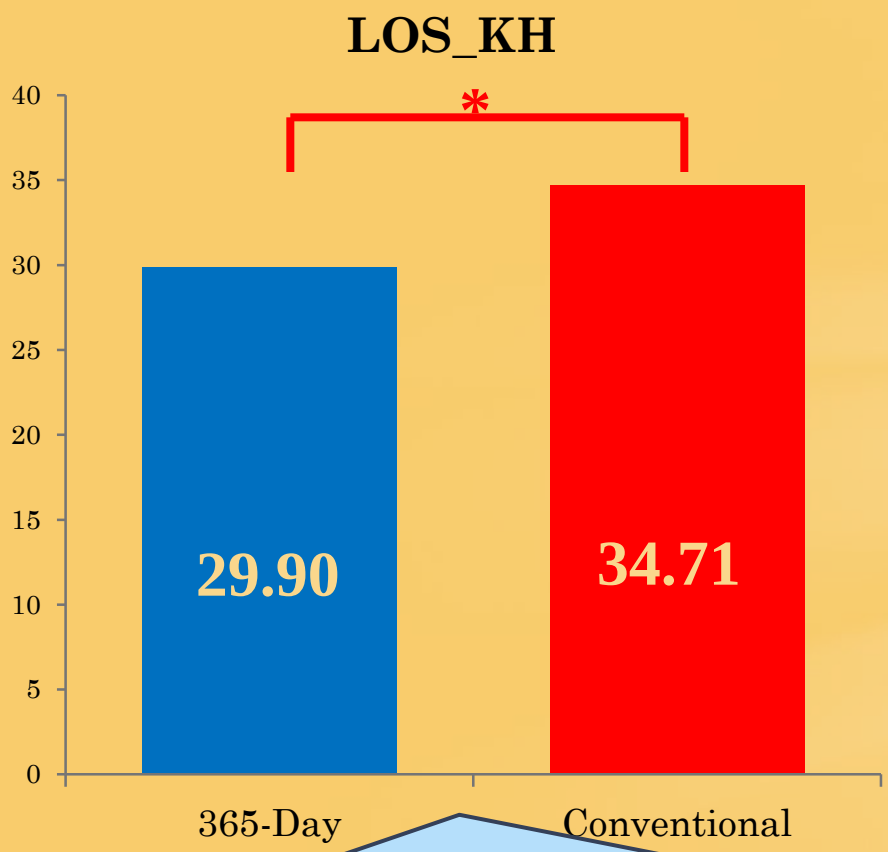
- ✓ No between groups difference was found
- ✓ Both groups showed significant improvement in pain relief & functional outcomes of EMS exceeding MCID of 2
- ✓ No difference between group on walking aids used
- ✓ Similar proportion of discharge home in both groups

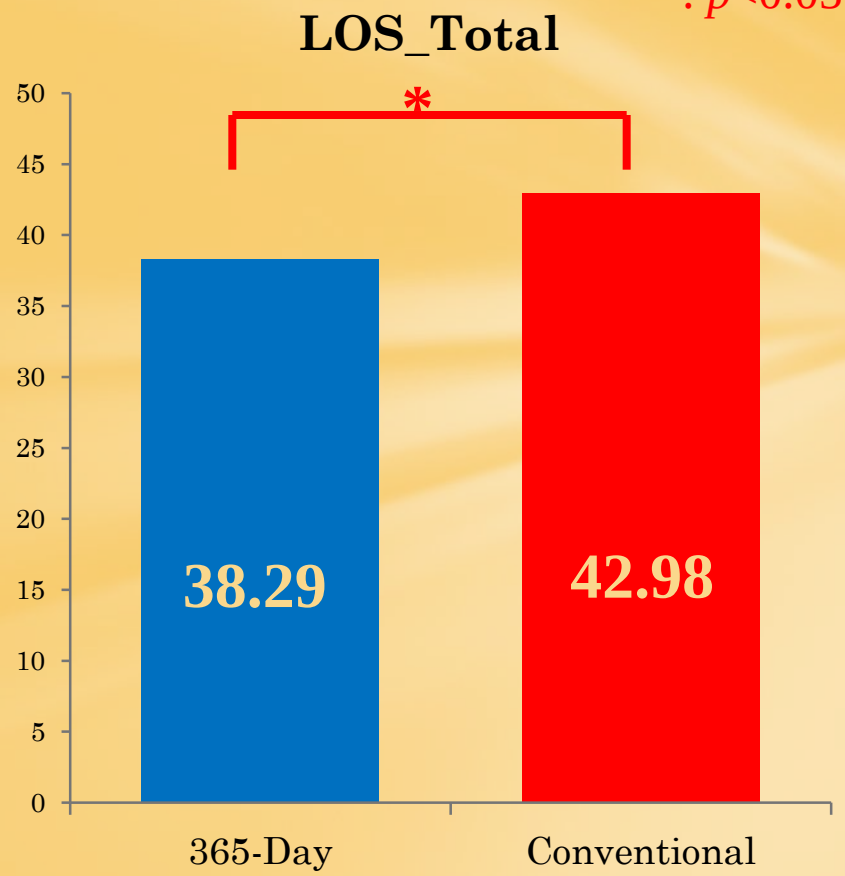
* : $p<0.05$

$p>0.05$ for between group comparison

LOS in KH & Total Episode LOS

* : $p<0.05$





4.7 Days Reduction of Hospitalization on average

→ Earlier achievement of rehabilitation outcomes

Discussion

Meta-analysis (Peiris *et al*., 2011) supported benefits of 365-day PT for *walking ability, self care, LOS & QoL*

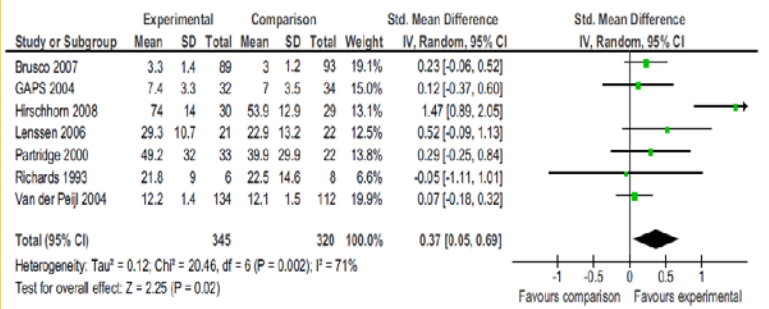


Fig 3. SMD (95% CI) for extra PT on walking ability trials (n=665).

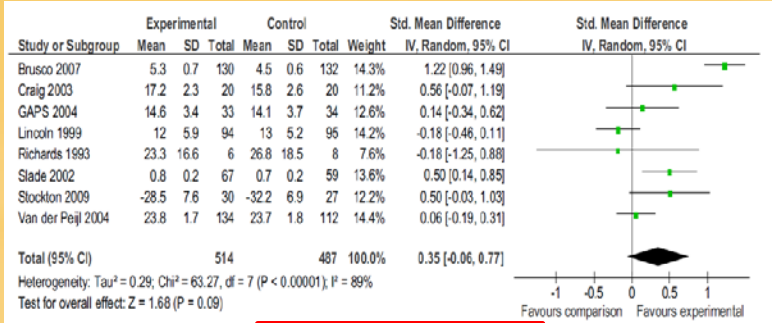


Fig 4. SMD (95% CI) for extra PT on self-care 8 trials (n=1001).

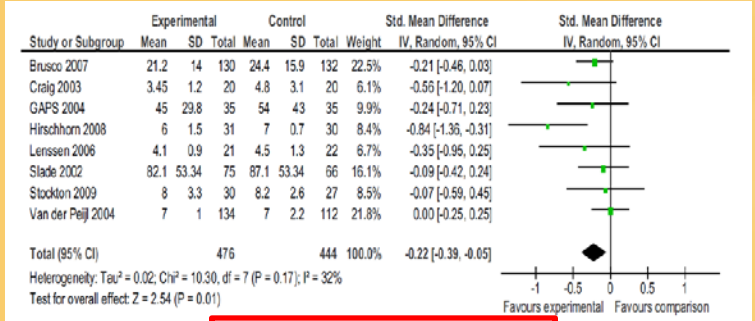


Fig 2. SMD (95% extra PT on length of stay trials (n=920).

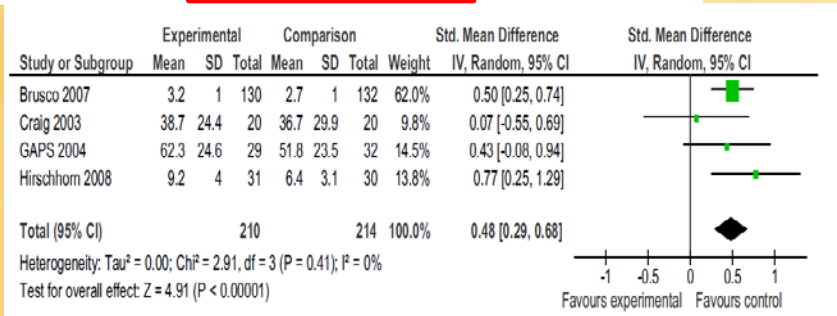


Fig 6. SMD (95% CI extra PT on quality of life n 4 trials (n=424).

Cost-effective per QALY gained & per MCID in functional independence (Brusco *et al*., 2014)

Discussion

Our result was in accord with findings of meta-analysis with reduction of LOS for hip fracture patients

- Yet without sacrificing functional outcomes achievement & comparable rate of home discharge

Sustaining downstream benefits in frail elderly

Provides earlier assisted supportive mobilization

- Minimize physical deconditioning due to bedrest and immobilization

Early patient engagement in rehabilitation

- Motivation and tuning the elderly for continuing of physical training in rehabilitation setting

Earlier & Comparable Improvement in Functional Outcomes at admission & discharge from Rehabilitation Hospital

- When 365-Day PT service was provided only in **acute** setting
- Average LOS in QEH post-surgery is 8.4 days – maximum of 2 additional PT trainings injected
- Reached comparable pain relief & functional gain with shorter LOS even for very old frail elders with moderate pain & high dependence
- What if ….. 365-Day PT service in rehabilitation setting to yield further benefits

CC(Rehab) & COC(AH)

18-046-AH-17-036

Scale-up from 17-036: Restorative Rehabilitation on Weekend & Public Holidays –
(1) 365-day physiotherapy service for patients with lower limb fracture and arthroplasty in acute and rehab settings;
(2) 365-day physiotherapy and occupational therapy service for stroke patients in extended care setting

Objective

Strengthen restorative rehabilitation on weekends and public holidays (PH), so as to:

- Maximize rehabilitation outcome
- Improve continuity of acute and rehabilitation services
- Facilitate patient flow, early and safe discharge

Strategies of HA Strategic Plan that the program aligns with

- Transform services to streamline care processes & improve efficiency

Clinical Significance-Benefits of 365-Day PT Service

Patients

Earlier community & social re-integration

↓

Enhanced QoL

Family

More flexible hours for patient & carers interaction

↓

Early engagement of carers in rehabilitation

Society

Generate more bed-days to cater for other service needs

Patients enjoy & continue consolidation rehabilitation at familiar home environment

More Cost-effective Model of Care - Facilitate Early and Safe Discharge

Shorten LOS without compromising opportunity for functional gain achievement

Conclusion

- ✓ 365-day PT service in acute setting can shorten LOS in extended care setting as well as the overall hospitalization period
- ✓ Even for frail elderly with compromised baseline mobility still benefitted from the additional acute PT services with sustaining benefits downstream in rehabilitation hospital
- ✓ This more cost-effective service model may promote recovery and facilitate early and safe discharge in alignment with corporate Strategies of “Transform services to streamline care processes & improve efficiency”.

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