

Supplementary materials to: Boh TL, Hu Y, Tan A, et al. Patient-centred outcomes and cost-effectiveness of a hospital-at-home service model for older adults. Ann Acad Med Singap 2026;55:OnlineFirst.

Supplementary Annex S1. Medical Home (MH) patient selection criteria: Inclusion and exclusion criteria

Inclusion criteria

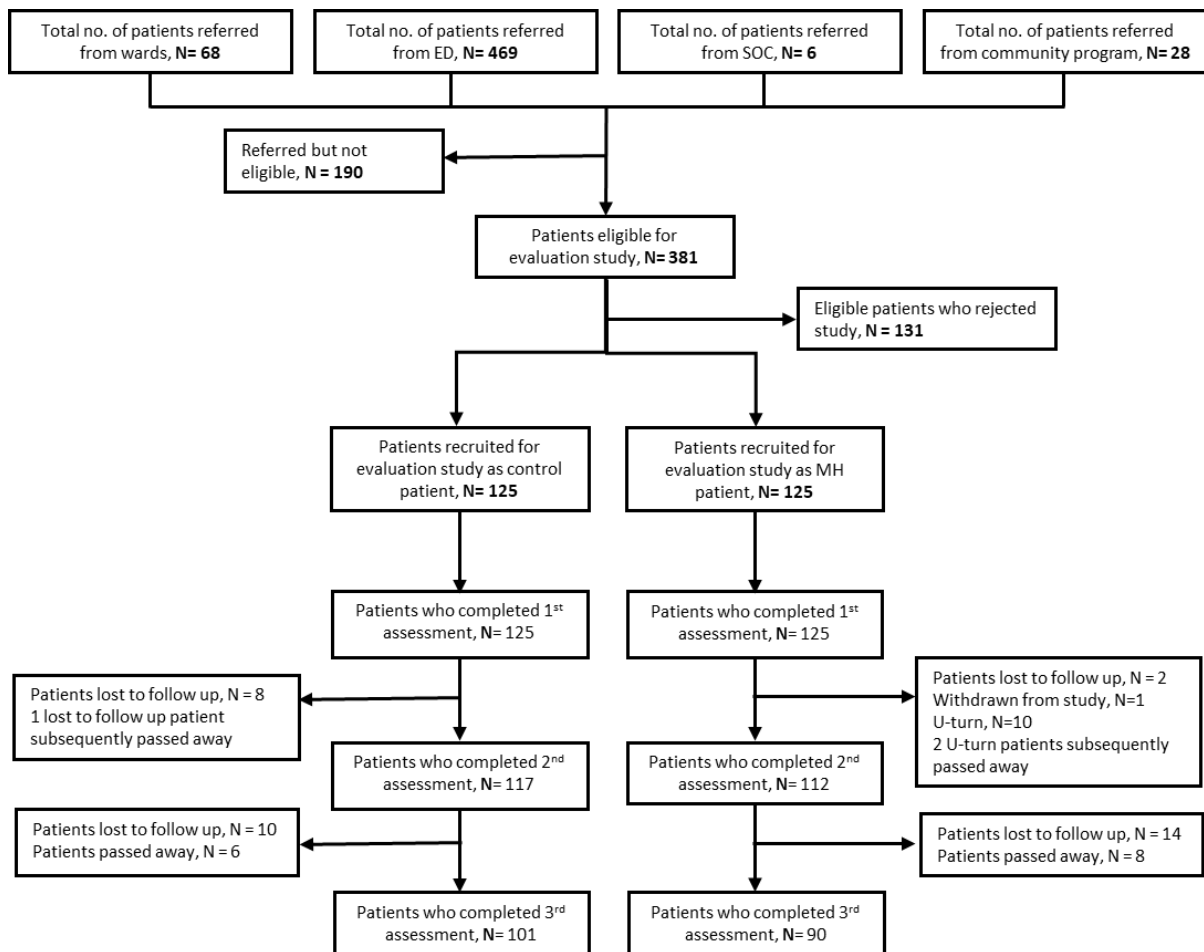
- Lives within service catchment area
- Meets validated clinical-appropriateness criteria for MH
 - Functional: Mild to moderate functional impairment
 - Medical: Patients with stabilized medical conditions such as:
 - Mild fluid overload from congestive cardiac failure or renal failure
 - Uncontrolled hypertension with no focal neurological deficits, where blood pressure is < 200/110 mmHg, patient is asymptomatic and medications can be adjusted at home.
 - Uncontrolled diabetes mellitus where blood sugar level is < 25 mmol and patient is not in Diabetic Ketoacidosis (DKA) or Hyperosmolar Hyperglycemic State (HHS).
 - Uncomplicated infections that can be treated with antibiotics at home, such as:
 - Urinary tract infections
 - Cellulitis
 - Infected pressure ulcers/sores; or
 - Upper Respiratory Tract Infections (URTI) in older adults
 - Patients already on warfarin therapy who need further titration and International Normalised Ratio (INR) monitoring, with no evidence of bleeding.
 - Patients with giddiness due to peripheral cause, with no central nervous system deficits and no evidence of stroke (either clinical or radiological).
 - Spinal compression fractures or backache from spinal stenosis or lumbar spondylosis where there is no spinal cord involvement and pain is manageable with oral analgesia.
 - Arthritis flare (e.g. osteoarthritis (OA), gout exacerbation) where pain is manageable with oral analgesia.
 - Older adults with geriatric syndromes such as:
 - Falls (especially if frequent) with stable/minor injury, no loss of consciousness, no major fracture, no need for surgical intervention and patient not in severe pain. If patient sustains a fracture, they should be seen by an orthopaedic surgeon and given early SOC review e.g. humerus or Colles fracture.

- Retention of urine needing indwelling urethral catheter (IDC) insertion with no evidence of spinal cord compression.
 - Dementia patients with behavioural problems and caregiver stress
- Social:
 - Patients must have adequate caregiving support at home.
 - If staying alone, patients need to be independent, safe and able to take medications reliably.

Exclusion criteria

- Nursing:
 - Intravenous (IV) Antibiotics needed > 2 times/day
 - Wound care needs > 30 min/session
- Medical:
 - Risk of potential cardiorespiratory deterioration
 - Surgery needed
 - Active bleeding
 - Agitated behaviour or suicidal thoughts
 - Acute stroke, acute myocardial infarction (AMI)
- Social: Nursing/sheltered home patients

Supplementary Annex S2. Patient flow



Supplementary Annex S3. Subgroup analysis by excluding U-turn patients: patient-centred outcomes

Patient-centred outcomes	Usual care, n=125	Medical Home, n=115	P value	Multiple regressions with adjustment^a	
Clinical outcomes				OR (95% CI)	P value
Readmission up to 90 days post-discharge, no. (%)	45 (36.0%)	35 (30.4%)	0.437	0.76 (0.37, 1.54)	0.450
Mortality within 90 days post-discharge, no. (%)	7 (5.6%)	7 (6.1%)	>0.999	0.30 (0.04, 1.44)	0.167
Nursing home placement at 90-day post-discharge, no. (%)	0 (0%)	0 (0%)	>0.999	-	-
Length of stay during index admission, mean (SD)	6.8 (4.1)	5.8 (2.8)	0.026	Coefficient (SE) -1.72 (0.52)	<0.001
Adverse event, no. (%)	5 (4.0%)	2 (1.7%)	0.512	OR (95% CI) 0.24 (0.01, 1.76)	0.220
Thrombophlebitis	1 (0.8%)	0 (0.0%)			
Medication error	0 (0.0%)	0 (0.0%)			
New pressure sores	0 (0.0%)	0 (0.0%)			
Falls	0 (0.0%)	1 (0.9%)			
Catheter related urinary tract infection	0 (0.0%)	1 (0.9%)			
Acute delirium	4 (3.2%)	0 (0.0%)			
Functional outcomes					
Modified Barthel Index score (MBI)				Coefficient (SE)	
Upon admission, mean (SD)	69.51 (27.81)	68.66 (32.83)	0.829	-	-
Upon discharge, mean (SD)	72.97 (27.04)	69.44 (33.01)	0.379	0.46 (2.88)	0.873
90-day post-discharge, mean (SD)	76.72 (26.81)	74.75 (29.39)	0.627	0.77 (3.09)	0.803
EQ-5D-5L utility score					
Upon admission, mean (SD)	0.34 (0.44)	0.40 (0.42)	0.232	-	-
Upon discharge, mean (SD)	0.52 (0.44)	0.50 (0.44)	0.721	0.06 (0.05)	0.266

90-day post-discharge, mean (SD)	0.48 (0.45)	0.54 (0.47)	0.324	0.11 (0.06)	0.051
Experience outcomes					
Caregiver burden score					
Upon admission, mean (SD)	12.90 (8.79)	12.43 (8.06)	0.751	-	-
Upon discharge, mean (SD)	12.19 (7.95)	10.77 (7.50)	0.301	0.24 (1.70)	0.890
90-day post-discharge, mean (SD)	10.78 (6.94)	7.67 (6.60)	0.020	-2.12 (1.55)	0.177
Patient's overall experience, mean (SD)	1.77 (0.47)	1.66 (0.48)	0.157	-0.10 (0.09)	0.279
Caregiver's overall experience, mean (SD)	1.96 (0.50)	1.63 (0.53)	<0.001	-0.35 (0.11)	0.002

CCI: Charlson Comorbidity Index; CFS: Clinical Frailty Scale; CI: confidence interval; EQ-5D-5L: EuroQol-5 dimension-5 level; MH: medical home; OR: odds ratio; SD: standard deviation; SE: standard error

^a Multiple logistic regressions for dichotomous outcome and multiple linear regression for continuous outcome, with adjustment for age, sex, education level, CCI score, CFS and patient acuity level status

P values in bold indicate statistical significance.

Supplementary Annex S4. Subgroup analysis by excluding deaths: patient-centred outcomes

Patient-centred outcomes	Usual care, n=118	Medical Home, n=115	<i>P</i> value	Multiple regressions with adjustment^a	
Clinical outcomes				OR (95% CI)	<i>P</i> value
Readmission up to 90 days post-discharge, no. (%)	41 (34.7%)	35 (30.4%)	0.574	0.82 (0.40, 1.67)	0.583
Nursing home placement at 90-day post-discharge, no. (%)	0 (0%)	0 (0%)	>0.999	-	-
Length of stay during index admission, mean (SD)	6.7 (3.9)	5.5 (2.6)	0.006	Coefficient (SE) -1.82 (0.50)	<0.001
Adverse event, no. (%)	4 (3.4%)	2 (1.7%)	0.703	OR (95% CI) 0.25 (0.01, 1.98)	0.239
Thrombophlebitis	1 (0.8%)	0 (0.0%)			
Medication error	0 (0.0%)	0 (0.0%)			
New pressure sores	0 (0.0%)	0 (0.0%)			
Falls	0 (0.0%)	1 (0.9%)			
Catheter related urinary tract infection	0 (0.0%)	1 (0.9%)			
Acute delirium	3 (2.5%)	0 (0.0%)			
Functional outcomes					
Modified Barthel Index score (MBI)				Coefficient (SE)	
Upon admission, mean (SD)	70.97 (27.19)	70.32 (32.40)	0.868	-	-
Upon discharge, mean (SD)	74.64 (26.43)	71.79 (31.60)	0.475	-0.21 (2.95)	0.943
90-day post-discharge, mean (SD)	76.72 (26.81)	74.75 (29.39)	0.627	0.77 (3.09)	0.803
EQ-5D-5L utility score					
Upon admission, mean (SD)	0.35 (0.44)	0.41 (0.43)	0.299	-	-
Upon discharge, mean (SD)	0.54 (0.43)	0.51 (0.44)	0.507	0.04 (0.05)	0.494
90-day post-discharge, mean (SD)	0.51 (0.44)	0.55 (0.47)	0.463	0.09 (0.06)	0.113
Experience outcomes					
Caregiver burden score					

Upon admission, mean (SD)	12.82 (9.21)	12.22 (7.82)	0.699	-	-
Upon discharge, mean (SD)	11.67 (7.85)	10.88 (7.50)	0.586	0.62 (1.83)	0.735
90-day post-discharge, mean (SD)	10.78 (6.94)	7.67 (6.60)	0.020	-2.12 (1.55)	0.177
Patient's overall experience, mean (SD)	1.77 (0.48)	1.67 (0.47)	0.187	-0.10 (0.09)	0.306
Caregiver's overall experience, mean (SD)	1.90 (0.43)	1.64 (0.53)	0.005	-0.29 (0.11)	0.009

CCI: Charlson Comorbidity Index; CFS: Clinical Frailty Scale; CI: confidence interval; EQ-5D-5L: EuroQol-5 dimension-5 level; OR: odds ratio; SD: standard deviation; SE: standard error

^a Multiple logistic regressions for dichotomous outcome and multiple linear regression for continuous outcome, with adjustment for age, sex, education level, CCI score, CFS and patient acuity level status

P values in bold indicate statistical significance.

Supplementary Annex S5. Healthcare resource utilisation and associated costs during index admission.

	Usual care, n=122 ^a			Medical Home, n=125		
	No. (%)	Quantity, mean (SD)	Unit cost (SGD), mean (SD)	No. (%)	Quantity, mean (SD)	Unit cost (SGD), mean (SD)
Ward						
Daily treatment fee	122 (100)	7 (4)	163 (4)^b	125 (100)	6 (3)	272 (0)^b
Ward charge	122 (100)	7 (4)	205 (24)	-	-	-
Phone calls	-	-	-	122 (98)	5 (3)	8 (0)
Transport	-	-	-	125 (100)	2 (2)	17 (0)
Home visits						
Doctor first visit	-	-	-	110 (88)	1 (0)	412 (0)
Doctor repeat visit	-	-	-	27 (22)	2 (1)	309 (0)
Nurse first visit	-	-	-	125 (100)	1 (0)	169 (0)
Nurse repeat visit	-	-	-	66 (53)	2 (3)	105 (0)
Allied health professionals	-	-	-	42 (34)	2 (1)	144 (0)
Surgery						
Facility fee	4 (3)	1 (0)	1,545 (440)	0 (0)	-	-
Surgical fee	5 (4)^b	1 (1)	495 (198)	0 (0)^b	-	-
Consultations						
Allied Health	100 (82)^b	4 (3)	69 (18)	0 (0)^b	-	-
Referral	25 (20)^b	1 (1)	109 (7)	0 (0)^b	-	-
Investigations						
Lab	121 (99)^b	23 (13)^b	49 (8)	65 (52)^b	4 (4)^b	50 (17)

Imaging	86 (70)^b	2 (2)	327 (221)	0 (0)^b	-	-
ECG	29 (24)^b	1 (1)	38 (37)	7 (6)^b	1 (0)	37 (1)
Medications	121 (99)^b	644 (499)^b	4 (4)^b	91 (73)^b	107 (145)^b	2 (2)^b
Procedures	121 (99)^b	24 (20)^b	27 (10)^b	48 (38)^b	4 (3)^b	47 (16)^b
Consumables	96 (79)^b	7 (6)^b	25 (61)	3 (2)^b	1 (1)^b	12 (8)
Vaccinations	2 (2)	4 (3)	50 (2)	0 (0)	-	-
Miscellaneous	36 (30)^b	1 (1)	35 (23)	0 (0)^b	-	-

ECG: electrocardiogram; SD: standard deviation

^a Could not access healthcare utilization data in the hospital database for three patients under the usual care group.

^b P value < 0.05

Costs are expressed in Singapore dollars (SGD).

Supplementary Annex S6. Healthcare resource utilisation and associated costs during 90 days post-index discharge.

Types of visits	Usual care, no=118 (excluding 7 deaths)			Medical Home, n=115 (excluding 10 deaths)		
	No. (%)	Quantity, mean (SD)	Unit cost (SGD), mean (SD)	No. (%)	Quantity, mean (SD)	Unit cost (SGD), mean (SD)
ED	56 (47)	2 (1)	639 (155)	46 (40)	1 (1)	688 (228)
Outpatient	83 (70)	3 (2)^a	182 (163)	102 (89)	4 (4)^a	217 (343)
Inpatient	45 (38)	1 (1)	7248 (6706)	44 (38)	2 (1)	6102 (4827)

ED: emergency department; SD: standard deviation

^a *P* value < 0.05

Costs are expressed in Singapore dollars (SGD).

Supplementary Annex S7. Subgroup analysis by excluding U-turn patients: cost-effectiveness outcomes.

Strategies	Cost (SE)^a	Incremental Cost (95% CI)¹	QALY (SE)^a	Incremental QALY (95% CI)^a	Incremental NMB (95% CI)^a
Usual care	SGD11,616 (3710)	-	0.13 (0.03)	-	-
Medial Home	SGD6160 (3520)	-SGD5455 (-SGD8652 to -SGD2259)	0.15 (0.03)	0.02 (-0.01 to 0.04)	SGD7361 (SGD2423 to SGD12,299)

CI: confidence interval; NMB: net monetary benefit; QALY: quality-adjusted life-year; SE: standard error

^aAdjusted for age, sex, education level, Charlson Comorbidity Index, Clinical Frailty Score, and patient acuity level status.

Costs are expressed in Singapore dollars (SGD).

Supplementary Annex S8. Subgroup analysis by excluding deaths: cost-effectiveness outcomes.

Strategies	Cost (SE)^a	Incremental Cost (95% CI)^a	QALY (SE)^a	Incremental QALY (95% CI)^a	Incremental NMB (95% CI)^a
Usual care	SGD9196 (3120)	-	0.14 (0.03)	-	-
Medical Home	SGD5668 (2950)	-SGD3529 (-SGD6237 to -SGD821)	0.15 (0.03)	0.01 (-0.01, 0.04)	SGD5049 (SGD728 to SGD9370)

CI: confidence interval; NMB: net monetary benefit; QALY: quality-adjusted life-year; SE: standard error

^aAdjusted for age, sex, education level, Charlson Comorbidity Index, Clinical Frailty Score, and patient acuity level status.

Costs are expressed in Singapore dollars (SGD).