Hospital-level care at home for adults with acute respiratory illness: A descriptive analysis

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Introduction

- "Home hospital" (HH) is hospital-level substitutive care delivered at home for acutely ill patients who would traditionally be cared for in the hospital.
- "Home hospital" is well implemented in parts of Europe and Australia, with increasing implementation in the US.
- The European experience surrounding COPD is the best studied.
- Despite years of successful operations and evidence, outcomes in the US specifically for respiratory disease, have not been evaluated.

The Home Hospital Model

Levine DM, et al. J Gen Intern Med.2018;33(5):729–65
Levine DM, et al. Annals of Internal Medicine. 2020.172(2) 77-85

Aims

- To analyze acutely ill patients' profiles and outcomes who require hospital-level care for a respiratory illness.
- To compare patients with respiratory and non-respiratory acute illness.

Materials and Methods

Study design and participants

- Retrospective analysis of a prospective trial.
- We compared patients requiring admission with respiratory disease to all other patients who received home hospital care.

Abbreviated inclusion criteria for respiratory patients

Diagnosis	Inclusion Criteria
AECOPD	BAP-65<3
Asthma	Peak expiratory flow > 50% of normal
Pneumonia	CURB-65 <3

Data sources and analysis

- We evaluated the most recent pulmonary function test (PFT) available.
- PFTs were performed according to ATS/ERS guidelines.
- We created 4 distinct categories 1) obstructive pattern; 2) non-obstructive pattern; 3) mixed pattern and 4) normal pattern.
- We compared discharge diagnosis with the PFT category.

Results

- From 2017 to 2021, 1,203 episodes were admitted to HH (n=1,031 patients).
- 24% with respiratory illness (41% PNA, 33% AECOPD, and 26% asthma).
- The most common non-respiratory diagnoses: heart failure (25%), urinary tract infection (20%), and skin and soft tissue infections (17%)
- Both groups were similar: mean age 68 (SD, 17), 62% female, and 48% White.
- Respiratory patients were more active smokers (21% *vs* 9%; p<0.001).
- 57% of respiratory patient's *vs* 50% of non-respiratory patients were admitted to HH through the ER.

Results

- Pulmonary function test data were available for 118 patients (47%).
- FEV_1/FVC was ≤70 in 80% of cases; 28% had severe or very severe obstructive physiology.

Parameter	Obstructive (n=74)	Non-Obstructive (n=18)	Mixed (n=2)	Normal* (n=24)
FEV_1 (%) pred, mean (SD)	53.6 (18.7)	68.2 (17.6)	63.0 (9.9)	99.0 (13.9)
FEV_1 absolute values (L)	1.4 (0.7)			
FVC (%)	75	67	68	100
FEV_1/FVC, mean (SD)	55.5 (11.7)	78.4 (7.7)	73.0 (3.4)	75.9 (5.3)
DLCO (%) pred, mean (SD)	44.6 (25.2)	54.8 (22.6)	Not tested	62.5 (18.4)

Home Hospital Diagnosis at Discharge	Obstructive	Non-Obstructive	Mixed	Normal*
AECOPD (n=54)[a] (%)	85	9	4	2
Asthma exacerbation (n=37)[a] (%)	49	22	0	30
Non-COVID Pneumonia (n=27)[a] (%)	37	19	0	44

[a] *Missing: (AECOPD n=29 (35%); Asthma n=29 (45%); Pneumonia n = 75 (74%))*
**Normal: FEV_1 and FVC > 80%*

- 96% of respiratory patients completed the full admission at home.
- 30 days after HH discharge. Similar in both groups.

	Non-respiratory (n = 780)	Respiratory (n = 251)	NON-COVID Pneumonia (n = 102)	AECOPD[a] (n = 83)	Asthma (n = 66)	p-value [b]
Mean LOS	4.7	3.4	2.9	3.8	3.6	<0.001
During HH						
Median lab orders	2.0	0	1.0	0	0	<0.001
IV medications (%)	73	43	70	23	29	<0.001
PT/OT sessions (%)	6	2	1	2	2	0.0080
Specialist/consultant (%)	7	1	2	0	0	<0.001
Nebulized medications (%)	7	67	33	87	94	<0.001
Transfer back/escalation (%)	3	4	8	1	3	0.37
Mortality (%)	0.1	0				>0.9
30 days after HH discharge						
Emergency room visits (%)	8	6	5	5	9	0.38
Readmissions (%)	12	12	12	13	9	>0.9
PCP visits (14 days) (%)	41	48	49	47	48	0.38
Mortality (%)	1	1	2	1	0	0.80

Conclusions

- Home hospital care is safe and effective for patients with acute respiratory illness compared to other general home hospitalized medical conditions.
- If scaled, it can serve to generate significant high-value capacity creation for health systems and communities, with opportunities to advance the complexity of care delivered.

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