

The Cost-effectiveness and Functional Impact of Post-Acute Care Location on Hip Fracture Patient Outcomes: A Systematic Review

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Background

- CDC reports that hip fractures occur in 250,000+ people over the age of 65 per year in the US¹
- Average cost per episode is about \$29,000 before rehab²
- 1 year mortality rates found to be at least 20%³
- Hip fractures have profound effect on patient functional mobility, independence, and quality of life³

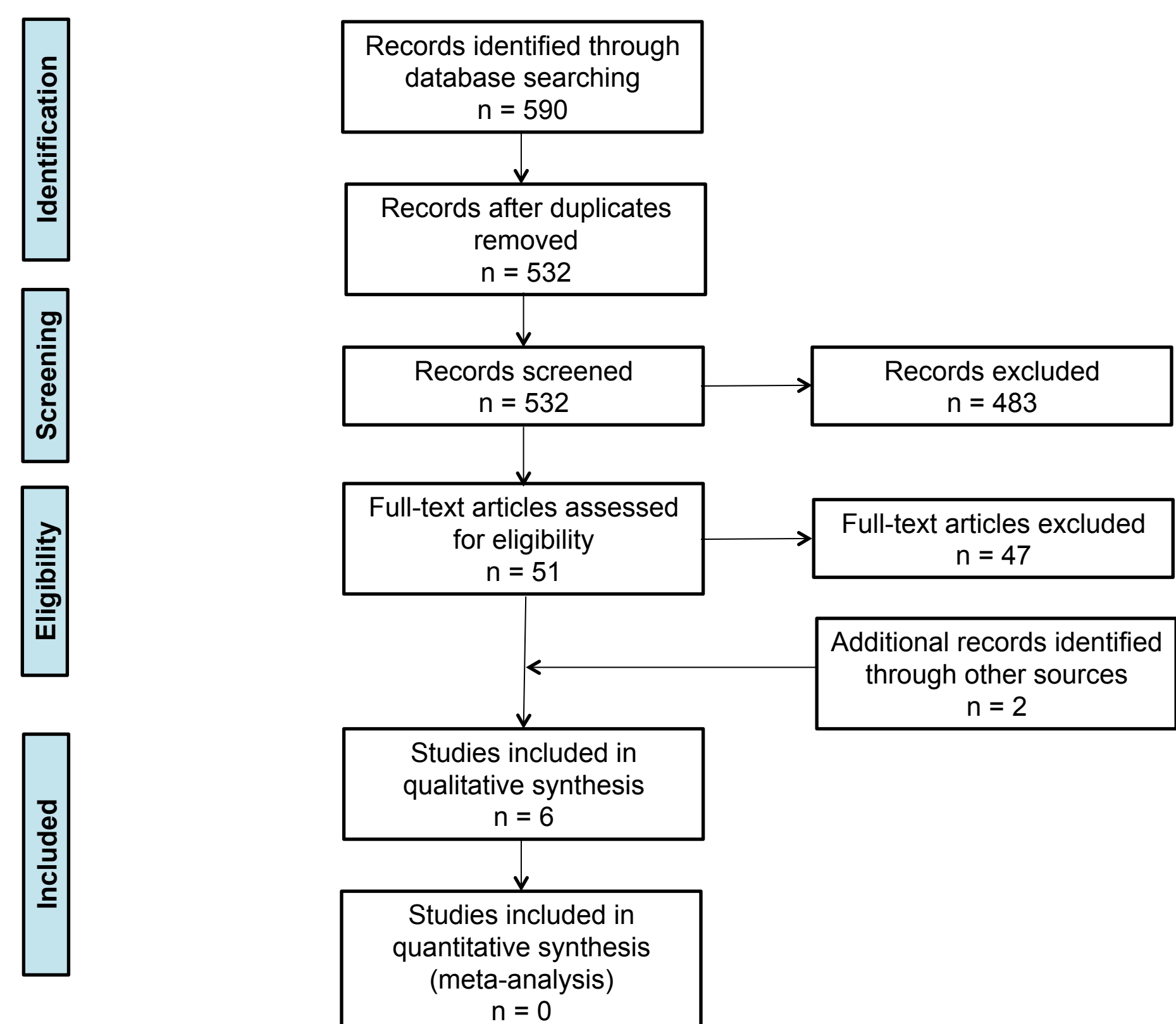
Purpose

To compare the outcomes and costs associated with post hip fracture patient rehab in IRF, SNF, and Home Health in order to establish appropriate guidelines for providers and payers.

Methods

- Systematic Review following PRISMA guidelines
- Databases searched: Pubmed, Embase, CINAHL and Cochrane Library
- Inclusion Criteria: published after 1990 in English, compare hip fracture rehabilitation in at least 2 of the 3 settings of interest, collected data in the US, 80% of the population above the age of 45, and reported functional, self-report, cost and/or impairment based outcomes.
- Articles were excluded if they focused specifically on cognitively/neurologically impaired individuals.
- Newcastle Ottawa Scale used for risk of bias assessment. Scores range from 0 to 9, where a higher score indicates a higher quality study.

Figure 1: PRISMA Flowsheet



Results

Table 1: Functional Outcomes

AUTHOR/ YEAR	POPULATION	COMPARATOR	OUTCOME MEASURES	FUNCTIONAL OUTCOMES	LOS	# PT SESSIONS	CONCLUSIONS	
Deutsch 2005	29,791 Medicare claims for FFS hip-fracture repairs in 96 & 97	IRF vs. SNF	Pre-admission and follow up motor FIM	IRF	Pre-admission: 44.8 (10.3) Follow up: 66.6 (13.4)	16.2 (8.0)	Functional outcomes did not differ significantly between IRF and SNF, but IRF had a shorter LOS.	
				SNF	Pre-admission: 42.8 (11.6) Follow up: 64.8 (6.9)	23.4 (15.2)		
Kane 2000	606 men and women over the age of 65 with hip fracture	Home no rehab vs. Home health vs. SNF vs. IRF	Change in functional ADLs measured at hospital discharge and 6 weeks, 6 months and 1 year post hospital discharge	Home	Hospital d/c: 20% 6 weeks: 52% 6 months: 43% 1 year: 40%	n/a	Significantly less ADL dependency (p<0.001) at 6 months for patients in IRF and discharged home as compared to SNF.	
				IRF	Hospital D/C: 15% 6 weeks: 12% 6 months: 22% 1 year: 23%			
				SNF	Hospital D/C: 46% 6 weeks: 21% 6 months: 16% 1 year: 12%			
Levi 1997	123 Community living women with hip fracture, 65+; excluded patients with cognitive or physical issues	Home health vs. SNFs	Average Barthel Index score at 2 and 6 months post hip fracture; LOS; Number of PT sessions	Home	2 months: 93 (12) 6 months: 89 (16)	.9 (3.4)	Home group had shortest LOS and the least PT. SNF group had a statistically significant (p<0.001) longer LOS and the most therapy. Differences found in 2 and 6 month Barthel Index measures were not statistically significant (p>0.5).	
				IRF	2 months: 89 (11) 6 months: 88 (17)	16.1 (13.1)		
				SNF	2 months: 80 (21) 6 months: 86 (17)	49.9 (45.3)		
Mallinson 2014	181 male and female patients following hip fracture, age 65+	8 Home Health agencies vs. 4 IRFs vs. 6 SNFs	Length of Stay, Changes in self care and mobility from PAC admission to discharge measured by the Inpatient Rehab Facility Patient Assessment Instrument/FIM	Home	Self care: 5.1 (5.0) Mobility: 8.2 (5.7)	32 (19)	IRF patients had the shortest LOS in PAC (p<0.0001)* compared to both SNF and HHA. There was no significant difference (p=0.2231)* between SNF and HHA. Home health received the fewest minutes of therapy while SNF and IRF received about the same amount. No significant differences were found in discharge FIM mobility scores based on setting (p>0.05).	
				IRF	Self care: 5.8 (3.1) Mobility: 7.4 (3.8)	15 (5)		
				SNF	Self care: 7.5 (4.7) Mobility: 7.8 (4.4)	28 (14)		
Munin 2005	Aged 60+ Hip fracture pts admitted to Univ. of Pittsburgh affiliated hospital between 3/1/02	IRF vs. SNF	Pre-admission and follow up motor FIM; Post Acute LOS	IRF	Pre-admission: 48 n = 42 2 weeks: 70 n = 38 12 weeks: 80 n=32	12.8 (6.0) n=36	n/a	IRF patients displayed significantly better functional outcomes at 2 and 12 weeks than SNF patients in addition to a shorter LOS.

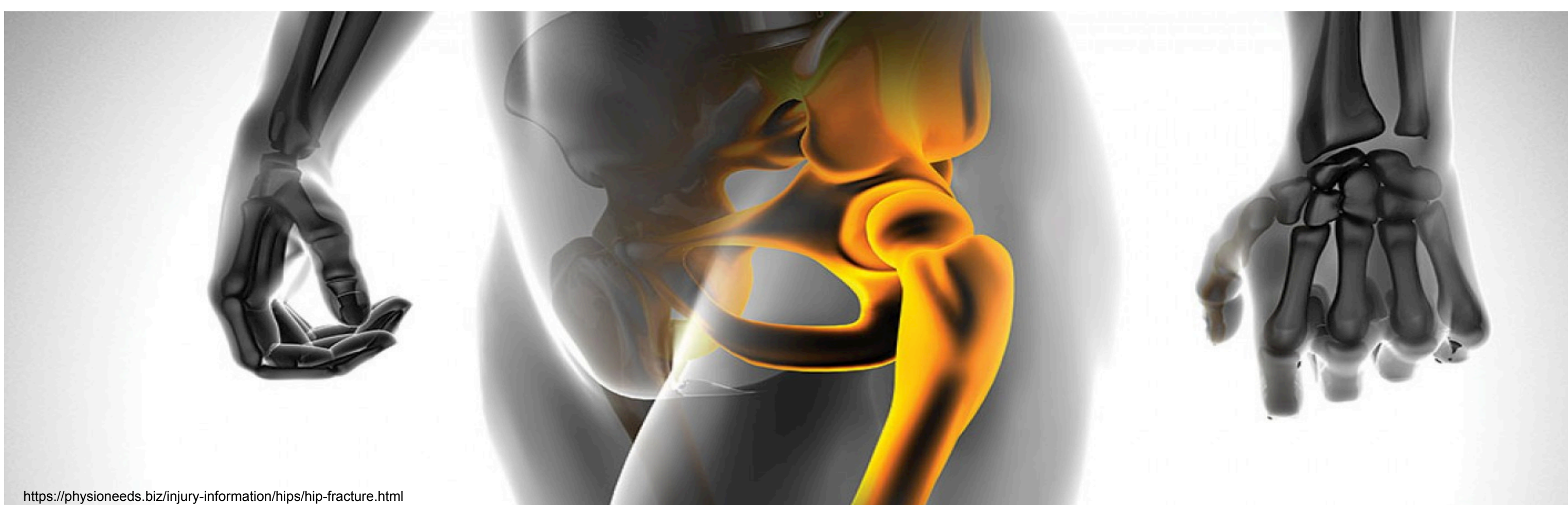


Table 2: Cost Assessment

AUTHOR/YEAR	POPULATION	COMPARATOR	OUTCOME MEASURES	DATA	CONCLUSIONS	
Buntin 2010	233,986 elderly hip fracture patients. Total Medicare post-acute Payment 120 days per patient (2010 U.S. dollars).	Home Health vs. IRF vs. SNF	Total Medicare Payments 120 days after	Medicare Payout	Home health was significantly (P<0.001) less expensive than both IRF and SNF. SNF was significantly (P<0.001) less expensive than IRF.	
				HOME		\$6,012
				IRF		\$23,344
Deutsch 2005	29,793 Medicare beneficiaries with a recent hip fracture who completed treatment in 1996 or 1997. Mean adjusted Medicare Part A payment per patient (1997 U.S. dollars).	IRF vs. SNF	Medicare Part A reimbursement	Medicare Payout	Cost were significantly (P< 0.001) less for the SNF setting compared to the IRF setting.	
				IRF		\$10,671
				SNF	\$7,433	

Results

6 articles included in the study, all patients over 60 y.o.

- Deutsch⁴ and Munin⁵ compared IRF to SNF
 - Munin found improved functional outcomes in IRF while Deutsch found no significant difference
- Kane⁶, Levi⁷, and Mallinson⁸ compared outcomes among SNF, IRF and HHA
 - Levi and Mallinson scored higher on the quality assessment and found no significant difference among discharge ADL scores
 - Deutsch, Levi, Mallinson, and Munin examined LOS
 - 3 found IRFs had significantly shorter LOS
- Buntin⁹ and Deutsch compared costs between settings
 - Buntin compared all 3 setting. Deutsch compared IRF to SNF
 - IRF is significantly more costly than SNF which is significantly more costly than home health

Table 3: Newcastle Ottawa Scale Scores

AUTHOR/YEAR	SELECTION	COMPARABILITY	OUTCOME	TOTAL
Deutsch 2005	3	0	2	5
Munin 2005	4	2	1	7
Kane 2000	4	0	3	7
Levi 1997	4	1	3	8
Buntin 2010	4	2	3	9
Mallinson 2014	4	2	2	8

Conclusions and Clinical Relevance

More consistent research involving comprehensive demographic and therapy-specific data is needed to draw definitive conclusions. Determining cost-effective care pathways that yield high-quality outcomes will play a critical role in the planning of resource allocation and plan of care development to improve the overall health and function of community populations.

Acknowledgements / References

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