

Cost and Effectiveness Analysis of Post-Acute Care vs. Non-PAC for Stroke Patients after Discharge from hospital

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Introduction

Stroke is the fourth leading cause of death and also is the major cause of long term disability and socioeconomic burden in Taiwan . In Taiwan, Post-Acute Care (PAC) program for stroke has been nationwide launched by National Health Insurance since 2014. PAC of stroke provide seamless transfer patients from acute to chronic phases featuring PAC of stroke program not only provide an organized, coordinated, multidisciplinary care but also a seamless transfer from acute to chronic phases.

PAC Program in Taiwan

1. Provide intensive inpatient rehabilitation, including physical, occupational, oral and language therapy
2. Package payment
3. Provide additional costs to hospitals that regularly assess the severity of stroke patients and provide that if the patient does not improve, it must be excluded from the program

Inclusive Criteria

1. Acute stroke symptoms ≤ 30 days
2. Stable vital signs and neurological function after ≥ 72 hours, and no or controllable complications (such as infection and gastrointestinal bleeding)
3. MRS score: 2-4
4. Willing and able to rehabilitate

The basic length of stay in this program is 3-6 weeks, up to 12 weeks at most

Objective

To compare the cost-effectiveness between PAC and non-PAC for stroke patient after discharge from acute hospital care.

Results

Table 1. Baseline characteristics of stroke patients

		General rehabilitation		PAC	
		n (%)		n (%)	
n		12,452		317	
Age (mean, SD)		69.27 $\pm$ 12.47		65.94 $\pm$ 11.81	
Gender	Male	7,376	59.24	205	64.67
	Female	5,076	40.76	112	35.33
CCI					
	0	3,946	31.69	119	37.54
	1	3,118	25.04	99	31.23
	2	2,096	16.83	46	14.51
	≥ 3	3,292	26.44	53	16.72
Stroke type	IS	10,165	81.63	262	82.65
	HS	2,287	18.37	55	17.35
SSI (mean, SD)		9.3 $\pm$ 6.17		8.66 $\pm$ 5.19	
	≤ 5	5,619	45.13	139	43.85
	6-11	2,871	23.06	89	28.08
	≥ 12	3,962	31.82	89	28.08
Mechanical ventilator	No	10,738	86.24	292	92.11
	Yes	1,714	13.76	25	7.89
RCC stay (Yes)		290	2.33	2	0.63
ICU Stay (Yes)		4,116	33.05	110	34.7
rTPA (Yes)		131	1.05	4	1.26
Thrombectomy (Yes)		16	0.13	2	0.63
Accreditation level					
	Medical Center	4,687	37.64	116	36.59
	Regional Hospital	6,169	49.54	156	49.21
	Local Hospital	1,596	12.82	45	14.2
Ownership					
	Public hospital	3,209	25.77	111	35.02
	Non-profit hospital	2,432	19.53	49	15.46
	Private hospital	6,811	54.7	157	49.53

Methods and Materials

Data came from two areas: National Health Insurance (NHI) claims data and patient survey.

1. Population-based longitudinal dataset, which consisted of 2 million randomly selected individuals from insured persons.
 - For NHI claims data, we defined stroke as the ICD-9-CM codes 430-434 and 436-437, and received CT/MRI +/- 10 days during index admission.
 - All patients were followed up regarding their survival for at least one year.
 - Direct costs between PAC group and non-PAC groups were estimated from the claims data and risk adjusted by the baseline characteristics, stroke severity index and treatments.
2. Face-to-face survey at one medical center from 2018/8 - 2019/5 to collect indirect costs and EQ-5D at discharge, 14 days, one month after discharge and one month after first follow up.

Results

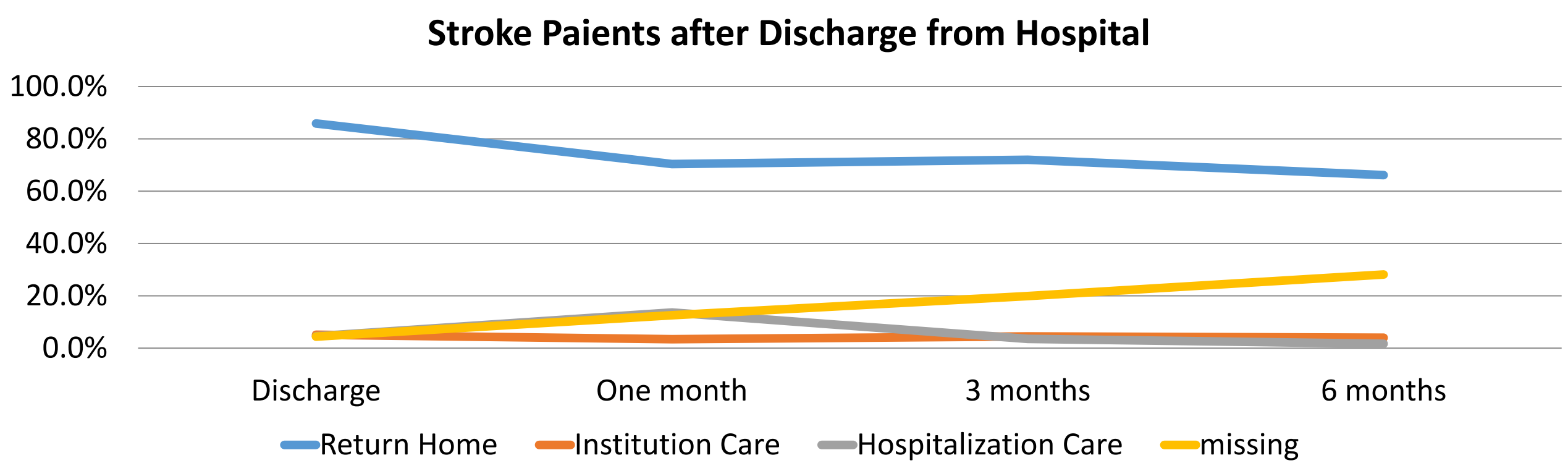


Figure 1: Stroke patients distribution after first discharge

Table 2. Direct costs of stroke patients

NTD	General rehabilitation		PAC		Difference (GR-PAC)
	n	mean	n	mean	
Cost of stroke admission	12,532	131,628	317	130,511	1,117
Length of stay of stroke admission	12,532	20	317	31	-11
Cost in 14 days after stroke admission (per patient)	4,805		99		
Ambulatory visit		3,211		1,262	1,950
Inpatient		14,560		106,825	-92,265
Overall cost		17,771		108,086	-90,315
Cost in 6 weeks after stroke admission (per patient)	9,371		169		
Ambulatory visit		5,665		3,589	2,076
Inpatient		16,029		74,400	-58,370
Overall cost		21,694		77,988	-56,294
Cost in 1-year after stroke admission (per patient)	11485		289		
Ambulatory visit		42,787		47,730	-4,942
Inpatient		75,031		112,390	-37,359
Overall cost		117,819		160,120	-42,301

Table 3. EQ-5D of different treatments

	General rehabilitation (GR)			PAC			Difference
	N	mean	(SD)	N	mean	(SD)	
stroke admission	80	0.29	0.54	17	0.21	0.53	0.08
Cost in 14 days after stroke admission	71	0.26	0.54	15	0.21	0.56	0.05
Cost in 6 weeks after stroke admission	37	0.42	0.5	12	0.57	0.32	-0.15

$$ICER = \frac{160,120 - 117,819}{0.57 - 0.42} = 282,007$$

Conclusions

Our results show that the incremental cost-effectiveness for PAC vs General rehabilitation was NT\$282,005 per QALY for the first year. We believe it will be even more cost-effectiveness after the first year.

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References

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