Participant flow

```
                    ┌─────────────────────────┐
                    │ Enrolled patients with  │
                    │ heart valve surgery     │
                    │ n=97                    │
                    └─────────────────────────┘
                              │         ┌──────────────────────────────┐
                              ├────────▶│ Not able to cooperate, n=5   │
                              │         │ Comorbidities, n=3           │
                              ▼         │ Exhausting exercise, n=2     │
                    ┌─────────────────┐ └──────────────────────────────┘
                    │ Eligible patients│
                    │ n=87            │
                    └─────────────────┘
                              │
                              ▼
                    ┌─────────────────────────┐
                    │ Written informed consent│
                    │ n=87                    │
                    └─────────────────────────┘
                              │  Measurement at baseline
                              ▼
                    ┌─────────────────┐
                    │ Randomized      │
                    └─────────────────┘
                     ╱                  ╲
                    ▼                    ▼
    ┌──────────────────────────┐   ┌──────────────────────────┐
    │ Allocated to intervention│   │ Allocated to control group│
    │ group  n=44              │   │ n=43                     │
    └──────────────────────────┘   └──────────────────────────┘
                │                              │
                ▼                              ▼
    ┌──────────────────────────┐   ┌──────────────────────────┐
    │ Early cardiac rehabilitat│   │ Usual care               │
    │ n=44                     │   │ n=43                     │
    └──────────────────────────┘   └──────────────────────────┘
                │                              │
                ▼                              ▼
    ┌──────────────────────────┐   ┌──────────────────────────┐
    │ Measurement at hospital  │   │ Measurement at hospital  │
    │ discharge  n=44          │   │ discharge  n=43          │
    └──────────────────────────┘   └──────────────────────────┘
           │      ┌──────────────┐     │      ┌──────────────┐
           ├─────▶│ Drop out, n=1│     ├─────▶│ Drop out, n=2│
           │      │ Death, n=3   │     │      │ Death, n=7   │
           ▼      └──────────────┘     ▼      └──────────────┘
    ┌──────────────────────────┐   ┌──────────────────────────┐
    │ Measurement 6 month later│   │ Measurement 6 month later│
    │ n=40                     │   │ n=34                     │
    └──────────────────────────┘   └──────────────────────────┘
```
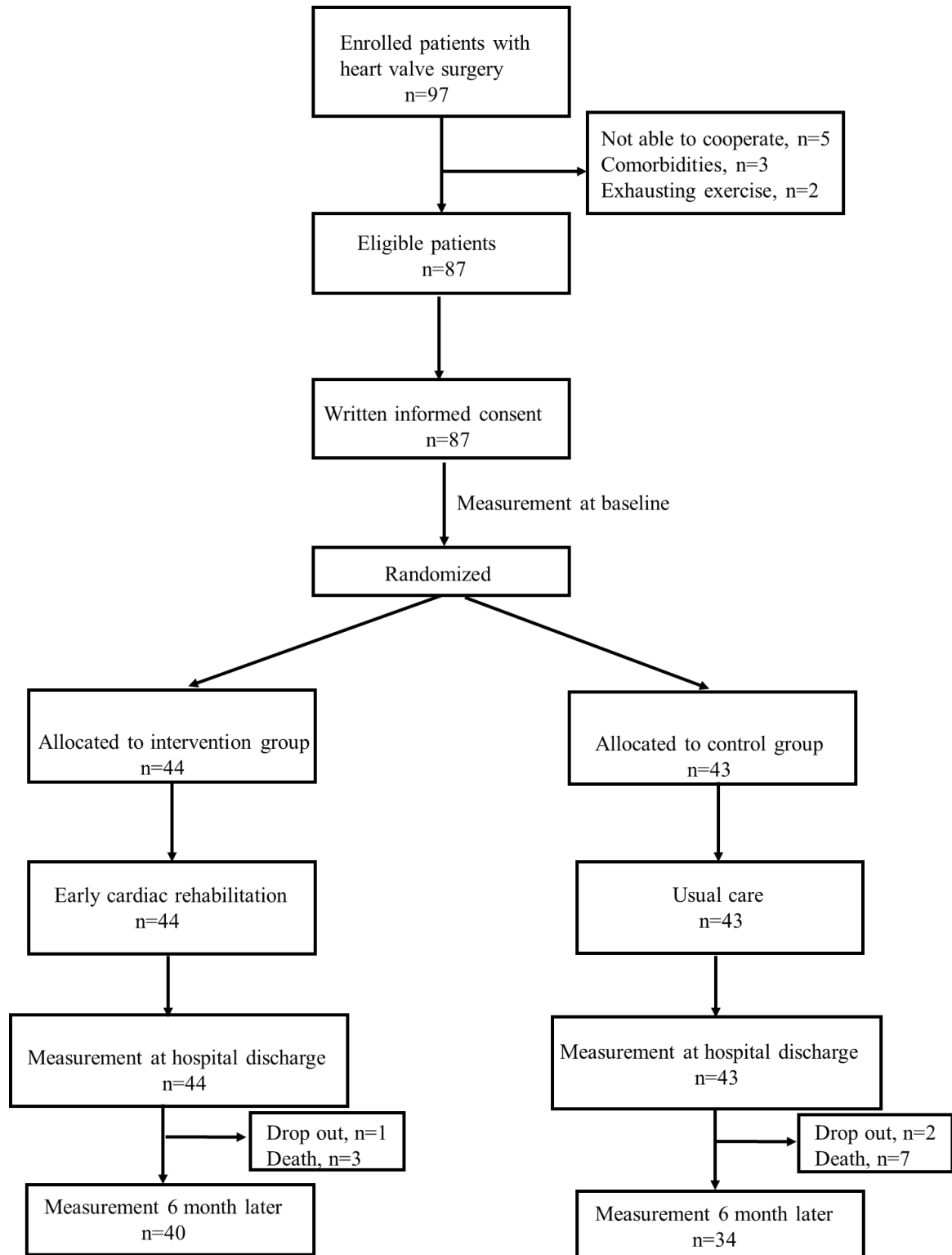
Baseline characteristics

Table 1 Demographic and clinical characteristics of the participants

Characteristics	Invention group (n=44)	Control group (n=43)	t (χ^2)	p
Sex (male/female)	29 (15)	27 (16)	0.09	0.761
Age (years)	58.20±5.27	57.98±4.18	0.23	0.824
BMI, kg/m^2	23.09±2.23	23.28±2.59	0.363	0.717
Systolic blood pressures, mm Hg	130-170	132-180	0.893	0.422
Diastolic blood pressures, mm Hg	77-100	75-100	1.235	0.121
Total cholesterol, mg/dL	4.61-1.1	4.70-1.1	0.764	0.413
Symptoms prior to surgery, n (%)	32	31	0.07	0.948
Type of heart valve:			0.16	0.992
Aortic valve	30	31		
Mitral valve	8	7		
Other [a]	6	5		
Hypertension	28	27	0.07	0.936
Hypercholesterolemia	19	16	0.32	0.570
LVEF, %	51-10	52-11	0.857	0.413

Abbreviations: BMI, body mass index; LVEF, postoperative left ventricular ejection fraction.

[a] other includes concomitant aortic and mitral valve surgery or right-sided valves.

Table 2 Main measurement between two group at three-time point

	Intervention group			Control group			Between-group	
	Baseline	Hospital discharge	After 6 months	Baseline	Hospital discharge	After 6 months	F	p
	(n=44)	(n=44)	(n=40)	(n=43)	(n=43)	(n=34)		
SPPB	8.86±1.52	10.18±1.28	10.11±1.70	8.74±1.83	9.09±1.38	8.95±1.70	5.40	0.002
p	0.684	0.001	0.023	-	-	-		
PCS	40.66±5.64	51.30±8.84	51.16±8.70	40.63±5.32	45.91±7.18	45.56±7.38	5.51	0.002
p	0.417	0.299	0.001	-	-	-		
MCS	46.45±7.04	50.16±6.47	51.75±8.05	47.58±7.16	48.79±7.19	48.14±8.47	1.29	0.283
p	0.329	0.292	0.110	-	-	-		
6MWT (meter)	311.52±54.98	360.36±60.26	415.50±65.68	309.58±57.44	316.56±61.14	367.77±54.69	7.10	0.000
p	0.326	0.000	0.004	-	-	-		
HADS-A	5.23±1.16	5.05±1.29	5.16±1.75	4.91±1.23	5.00±1.16	5.12±1.61	0.59	0.624
p	0.335	0.761	0.512	-	-	-		
HADS-D	4.77±1.61	4.86±1.25	4.70±1.13	4.93±1.55	4.86±1.11	4.60±1.28	0.02	0.996
p	0.827	0.927	0.961	-	-	-		

Table 3 Logistic regression predicting the likelihood of morality

	B	SE	Wald	df	*p*	OR	95% CI for OR Lower	Upper
Age	0.058	0.105	0.306	1	0.580	1.060	0.862	1.303
Sex	0.513	0.780	0.433	1	0.511	1.671	0.362	7.714
Type of heart valve	-0.699	0.777	0.809	1	0.368	0.497	0.108	2.280
SPPB	-0.878	0.329	7.126	1	0.008	0.416	0.218	0.792
PCS	-0.023	0.050	0.212	1	0.645	0.977	0.886	1.078
6MWT	-0.002	0.007	0.132	1	0.716	0.998	0.984	1.011

Note: SE, standard error; OR, odds ratio.

Adverse events

Table 4　Incidence of adverse events

Variables	Intervention group (n=44)	Control group (n=43)	t (χ2)	*p*
Readmission	5	8	0.90	0.344
Mortality	3	7	1.91	0.167