



Association of Perioperative β -Blockade With Mortality and Cardiovascular Morbidity Following Major Noncardiac Surgery

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Background


The effectiveness and safety of perioperative β -blockade for patients undergoing noncardiac surgery remains controversial.

1. Some analyses remain limited to continuation of preexisting β -blockade
2. Some analyses limited by inability to account for outpatient medication use, the type of β -blocker, and uncertainty regarding the date of surgery and has not been corroborated in another large clinical data set.



Methods

1. Race/ethnicity was coded to be white, black, or other using patient self-reported data obtained from the VA Surgical Quality Improvement Program (VASQIP).
2. between October 1, 2005, and September 30, 2010, were obtained from the VASQIP database.
3. 7 surgical subspecialties (vascular, general, neurosurgery, orthopedics, thoracic, urology, and otolaryngology)

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- patients following adjustment for surgery on the day of hospital admission
 - patients dying during the exposure period
 - multiple surgeries
 - combinations of the aforementioned

1. from January 2005 through August 2010.

2. 136745 patients who were 1:1 matched on propensity scores (37805 matched pairs)



Results

Variables	Full Cohort				Matched Cohort			
	Percentage of Patients			P Value	Percentage of Patients			P Value
	All (n = 136 745)	Exposed (n = 55 138)	Not Exposed (n = 81 607)		All (n = 75 610)	Exposed (n = 37 805)	Not Exposed (n = 37 805)	
Age, mean (SD), y	64.4 (10.2)	65.3 (9.9)	61.3 (11.5)	<.001	62.9 (11.1)	64.4 (10.0)	64.4 (10.4)	.60
Race								
White	66.4	67.5	65.1	<.001	66.1	66.5	66.3	.27
Sex								
Men	96.3	96.9	94.1	<.001	95.3	96.3	96.3	.92
Body mass index, mean (SD) ^b	29.3 (5.7)	29.3 (5.7)	28.8 (5.5)	<.001	29.0 (5.6)	29.3 (5.6)	29.2 (5.7)	0.09
Preoperative risk variables								
ASA physical status classification								
I	0.1	0.1	1.3	<.001	0.8	0.2	0.1	.07
II	16.6	12.5	29.8		22.8	16.8	16.4	
III	74.4	75.7	63.5		68.4	74.0	74.8	
IV	8.7	11.6	5.3		7.8	8.9	8.6	
V	0.1	0.1	0.1		0.1	0.1	0.1	
Revised Cardiac Risk Index variables								
Congestive heart failure	9.8	15.2	5.3	<.001	9.3	10.2	9.4	<.001
Cerebrovascular disease	10.0	12.2	6.6	<.001	8.8	10.2	9.9	.2
Diabetes (insulin)	10.4	12.5	6.5	<.001	8.9	10.3	10.4	.7
Diabetes (insulin or oral)	27.5	30.7	19.1	<.001	23.8	27.5	27.5	.99
Ischemic heart disease	28.0	42.9	14.7	<.001	26.1	28.2	27.7	.16
High-risk surgery	40.4	40.9	35.9	<.001	37.9	39.5	41.2	<.001
Renal insufficiency	3.2	4.2	1.9	<.001	2.8	3.3	3.1	.11
Laboratory measurements, mean (SD)								
Serum creatinine, mg/dL	1.2 (0.8)	1.2 (0.8)	1.1 (0.6)	<.001	1.1 (0.7)	1.2 (0.8)	1.2 (0.8)	<.001
Hematocrit, %	41.0 (8.8)	40.8 (4.9)	41.5 (4.6)	<.001	41.2 (4.7)	41.0 (8.8)	41.0 (8.8)	.74
White blood cell count, ×10 ³ /μL	7.9 (3.9)	8.0 (3.6)	7.8 (3.8)	<.001	7.9 (3.7)	7.9 (3.5)	8.0 (4.3)	.6

Surgical details

Surgery specialty

General	26.6	26.1	24.3		25.0	26.1	27.0	
Neurosurgery	8.6	7.9	10.2		9.3	8.8	8.4	
Orthopedic	28.7	25.9	33.5		30.5	29.3	28.1	
Otolaryngology	4.0	3.6	4.5	<.001	4.1	4.0	4.0	.002
Thoracic	6.9	7.2	5.1		5.9	6.8	7.0	
Urology	14.6	12.5	16.7		15.0	14.4	14.8	
Vascular	10.6	16.8	5.7		10.1	10.6	10.6	
Emergency procedure	6.4	6.2	6.6	.006	6.4	6.3	6.5	.5
Laparoscopic procedure	10.8	10.7	10.1	<.001	10.4	10.6	11.0	.04
Endovascular procedure	1.5	2.6	0.8	<.001	1.5	1.5	1.5	.76
Duration of surgery, mean (SD), h	2.8 (1.7)	2.89 (1.7)	2.73 (1.7)	<.001	2.8 (1.7)	2.8 (1.7)	2.8 (1.7)	.74
Principal anesthesia technique								
General	89.2	89.3	88.9		89.1	89.0	89.4	
Spinal/epidural alone	8.9	8.6	9.3	<.001	9.0	9.0	8.7	.28
Other	1.9	2.1	1.8		1.9	1.9	1.9	

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	All (n = 136 745)	Exposed (n = 55 138)	Not Exposed (n = 81 607)		All (n = 75 610)	Exposed (n = 37 805)	Not Exposed (n = 37 805)	
30-d All-cause mortality	1.1	1.4	1.0	<.001	1.3	1.1	1.5	<.001
Cardiac complications								
Cardiac arrest	0.6	0.8	0.4	<.001	0.7	0.6	0.7	.01
Q-wave myocardial infarction	0.3	0.5	0.3	<.001	0.4	0.3	0.5	<.001
Composite cardiac complication	0.9	1.2	0.7	<.001	1.0	0.8	1.2	<.001
Cerebrovascular accident	0.3	0.4	0.2	<.001	0.4	0.4	0.3	.45
Total surgical LOS, median (IQR), d	4 (3-7)	4 (3-7)	4 (3-6)	<.001	4 (3-7)	4 (3-7)	4 (3-7)	0.25
Total hospital LOS, median (IQR), d	4 (3-7)	5 (3-7)	4 (3-7)	<.001	4 (3-7)	4 (3-7)	4 (3-7)	0.80



结果分析

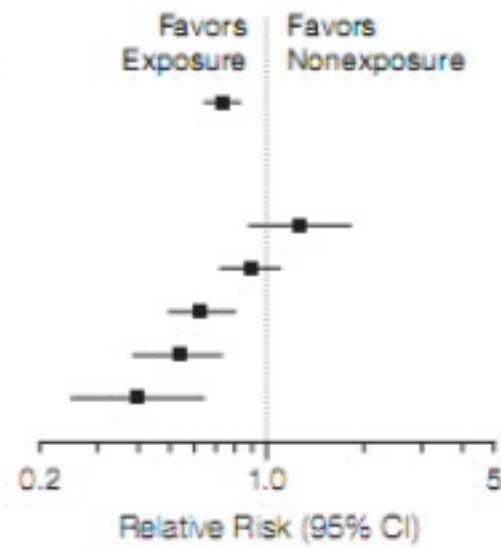
总样本中：

- 1.服用 β 受体阻滞剂组总体6项心脏风险指数变量明显高于未服用组。
- 2.手术类型中，血管外科手术明显高于未服用组。

Figure 1. Thirty-Day Mortality Propensity Model

A All surgery

	Nb. of Patients		Nb. of Deaths	
	Exposed	Not Exposed	Exposed	Not Exposed
All Patients	37 805	37 805	428	583
Nb. of Revised Cardiac Risk Index predictors				
0	12 250	12 250	67	53
1	16 057	16 057	166	186
2	6 795	6 795	111	176
3	2 090	2 090	59	110
>4	613	613	23	58



B Vascular surgery

	Nb. of Patients		Nb. of Deaths	
	Exposed	Not Exposed	Exposed	Not Exposed
All Patients	3999	3999	55	62
Nb. of Revised Cardiac Risk Index predictors				
0	857	857	5	6
1	1593	1593	20	21
2	1033	1033	11	18
3	403	403	13	12
>4	113	113	6	5

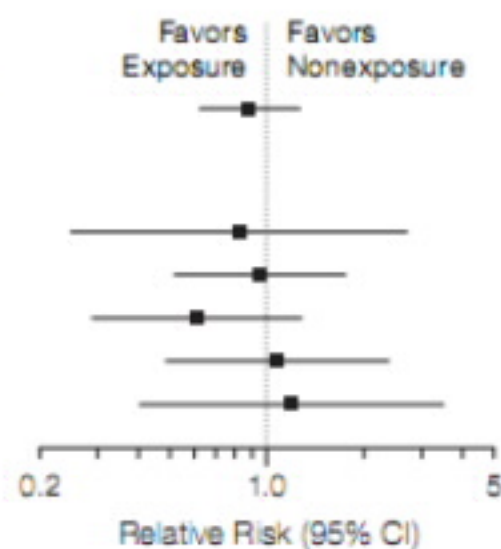
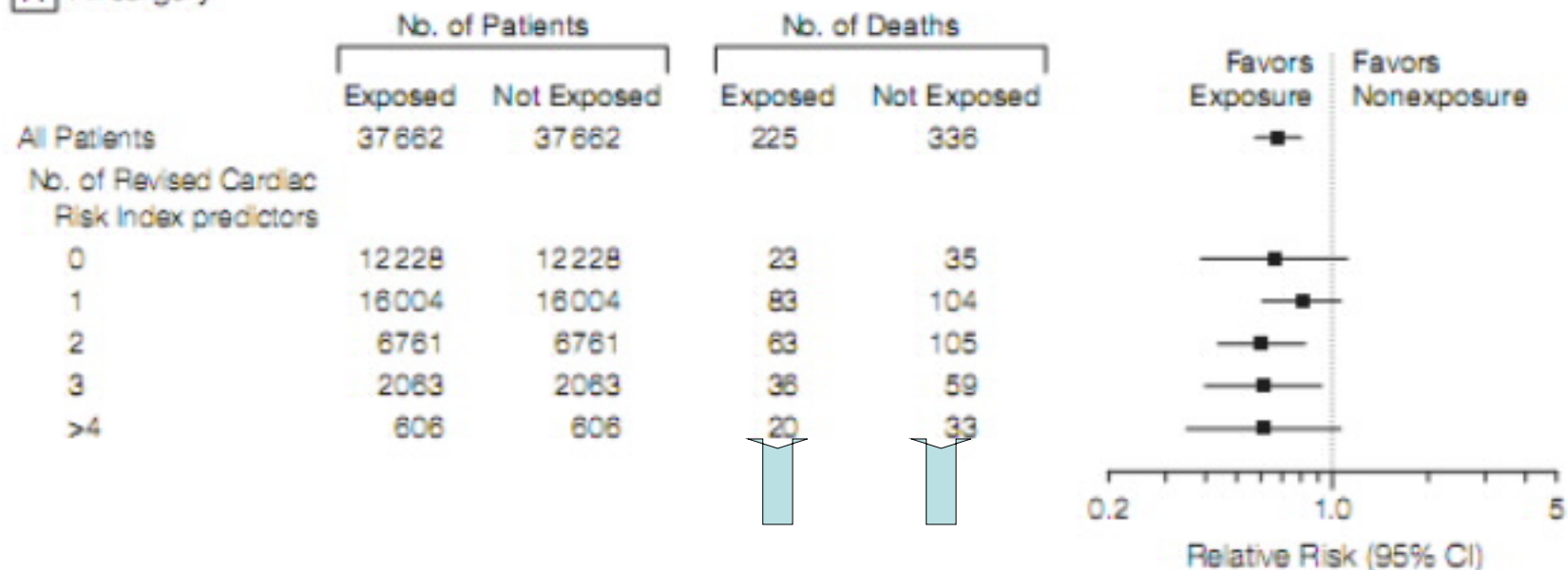
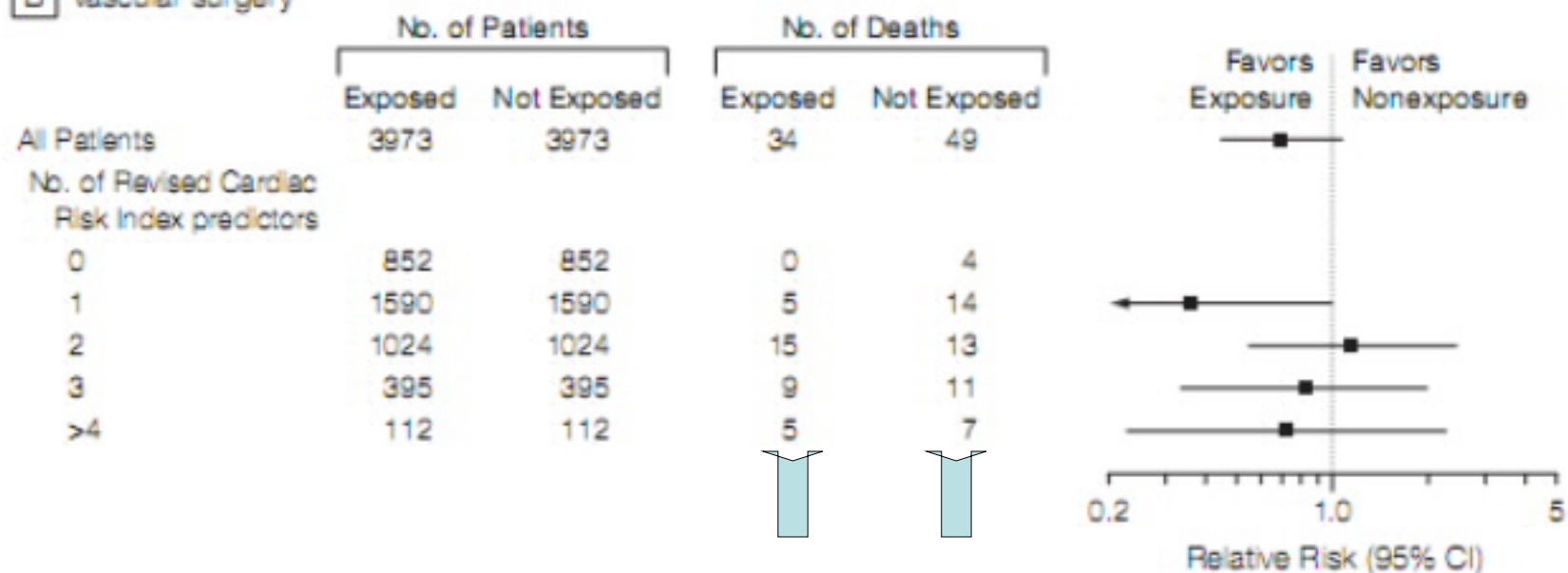


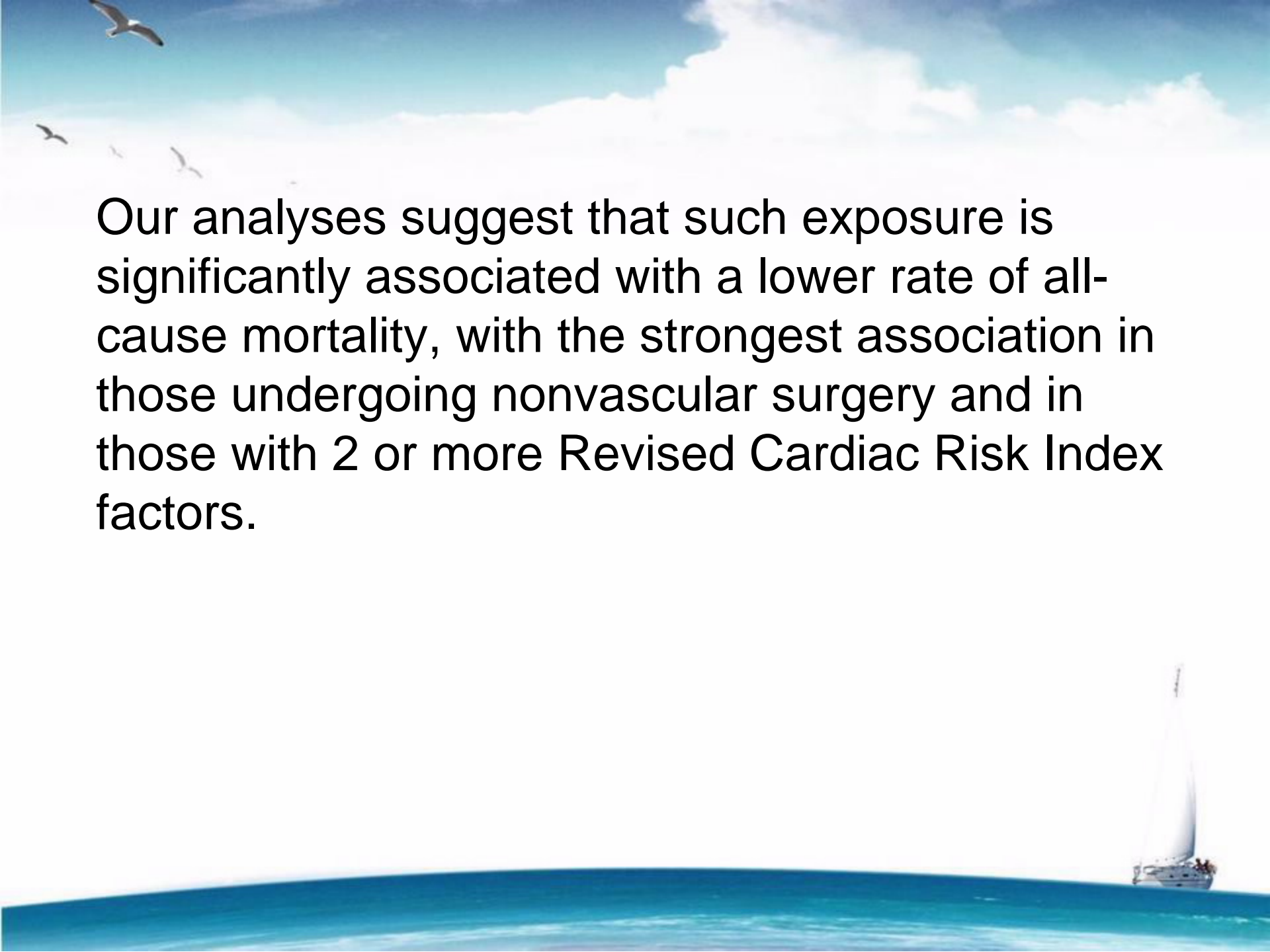
Figure 2. Thirty-Day Cardiac Morbidity Propensity Model

A All surgery



B Vascular surgery





Our analyses suggest that such exposure is significantly associated with a lower rate of all-cause mortality, with the strongest association in those undergoing nonvascular surgery and in those with 2 or more Revised Cardiac Risk Index factors.



局限性:

1. 只统计了非心脏手术

2. 病人使用了多种药物，其它药物可能影响结果

3. 未分析对比长时间服用 β -受体阻滞剂和入院后短时间服用 β -受体阻滞剂的差异

总结

术前使用 β -受体阻滞剂对病人是有益的，能明显减少危重患者心血管系统并发症和30天死亡率，是围术期和术后病人更加安全。



Thank you!!!