· ·

ERAS

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enhanced recovery after surgery ERAS

[1] ERAS

[2]

ERAS 2007

ERAS [3-4]

ERAS

ERAS

ERAS

ERAS

ERAS 1

ERAS

ERAS ERAS

ERAS

1.

2.

3.

venous thromboem-bolism VTE

[5]

4.

5. ERAS

ERAS ——

ERAS

ERAS

ERAS –

–

KPS QOL SF-12

NRS 2002 SGA

HAD MMSE MoCA –

VTE Caprini Autar DVT VTE Caprini ≥3 Autar DVT ≥11

PONV PONV Apfel PONV 5-HT_3

PONV

VAS >4

AEDs

6 h 2 h

400 ml

KPS Karnofsky QOL SF-12 NRS 2002 2002 SGA HAD MMSE MoCA VAS VTE DVT PONV AEDs "– "

antiepileptic drugs AEDs

[7]

2002 nutritional risk screening 2002 NRS 2002 [6]

>4 h

[8]

subjective global assessment SGA

VTE

Caprini Autar

>16.6 mmol/L deep vein thrombosis DVT

Caprini VTE

VTE

VTE

60% DVT

30% 1%

ERAS VTE

VTE [9]

Karnofsky

12-item short form health survey SF-12

hospital anxiety and depressive scale HAD

mini-mental state examination MMSE

Montreal cognitive assessment MoCA

[10]

1

2

2

[11]

[12]

1

2

3

postoperative nausea and vomiting PONV

PONV

PONV 47% ~70%

PONV

PONV Apfel

visual analogue scale VAS

PONV Apfel 4

PONV

[13]

0~1 2 3~4

PONV

PONV

PONV

N_2O

>

6 h PONV [14]

PONV

Braden

ERAS 2

6 h

2 h

2 h ≤400 ml 12.5% [15]

≥65

H_2

[16]

ERAS ——

ERAS

0.2%

>3 h

BIS

>36 ℃

CO SV △SV SVV

PPV

CO_2

3~4 h

BIS CO SV SVV PPV

AEDs

[17]

[18]

–

[19-20]

bispectral index BIS

BIS 40~60

[21]

ERAS goal-directed fluid therapy GDFT

cardiac output CO

stroke volume SV

CO SV △SV

stroke volume variation SVV

pulse pressure variation PPV

[22]

1 ~ 3 d

α

[23]

6 ~ 8 ml/kg 12 ~ 15 /min positive end-expiratory pressure PEEP 3 ~ 5 cmH_2O 1 cmH_2O = 0. 098 kPa FiO_2 < 60% PEEP [24]

1

CO_2

>36 ℃

> 36 ℃

21 ℃[25]

PONV

2 h

4 h[26]

ERAS ERAS

[27]

ERAS

ERAS

28

ERAS 3

ERAS

ERAS 1

2 000 ml 2

1 000 ml

3

ERAS ——

ERAS

6 h

NSAIDs

6 h

48 h

H_2

PONV PONV PONV PONV

PONV

1 1 000 ~ 2 000 ml 2 0 ~ 1 000 ml

VTE VTE

* Ù ÑbQ •

6 h

60%

24 h

“ ”

6

4.4 ~6.2 mmol/L

<10 mmol/L [29]

CT

MRI

AEDs

يم شج

3

β_2

β_2

β_2

4

[32]

stress related mucosal disease

SRMD

2

SRMD

SRMD

SRMD

SRMD

$pH \geqslant 4$

H_2

SRMD [33]

SRMD

1

2

pH $pH \geqslant 6$

3

4

5

PONV

1. PONV PONV

PONV PONV

N_2O

[14]

PONV

PONV $5\text{-}HT_3$

NK-1

$5\text{-}HT_3$

PONV

[34]

PONV

PONV

1 ~ 2

2 2

PONV

[35]

2. PONV PONV

PONV

PONV

PONV

PONV $5\text{-}HT_3$

PONV

$5\text{-}HT_3$

4 h PONV

6 h PONV

[36]

1.

2. 1

2 6 h

24 h

3

application to healthy patients undergoing elective procedures an updated report by the American Society of Anesthesiologists task force on preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration J . Anesthesiology 2017 126 3