

1997; 78:606-617 BJA
British Journal of Anaesthesia

Multimodal approach to control postoperative pathophysiology and rehabilitation

H. Kehlet

ERAS: from pioneering to reflections on the accelerated model of hip and knee arthroplasty

Lancet 2003; 362: 1921

Anaesthesia, surgery, and challenges in postoperative recovery

Henrik Kehlet, Jørgen Dahl

- organ dysfunction ("surgical stress")
- hypothermia-induced morbidity
- pain
- PONV / ileus
- fluid excess/ hypovolaemia
- cognitive dysfunction/sleep disturbances
- immobilisation/semi-starvation
- blood management
- fatigue (early/late)
- traditions (tubes, drains, restrictions, etc.)

Acta Anaesthesiol Scand 1979;23:503-4.

Stress Free Anaesthesia and Surgery

H. KEHLET

modification of the surgical stress responses

Kehlet & Wilmore
Kehlet & Lindberg-Larsen

Ann Surg 2008;248:189
Acta Orthop 2018;89:477

Medicine (Baltimore) 2015;94:e1286. Medicine

Enhanced Recovery After Surgery: Which Components, If Any, Impact on The Systemic Inflammatory Response Following Colorectal Surgery?

A Systematic Review

David G. Watt, MB, ChB, Stephen T. McSorley, MB, ChB, Paul G. Horgan, PhD, and Donald C. McMillan, PhD

- n = 19
- except for lap surgery, no "evidence" that components of ERAS reduce inflammatory responses (carbohydrate, fluid-therapy, bowel prep etc.)

Acta Orthop 2018;89:477-9. Acta Orthopaedica

High-dose glucocorticoid before hip and knee arthroplasty: To use or not to use—that's the question

Kehlet H. & Lindberg-Larsen V.

pain ↓ fatigue ↓ safety ↑
CRP ↓ endothelial function ↑
glucose homeostasis (↓)

need for dose-finding and repeat-dosing studies

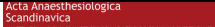
Anesthesiology 2013;118:780-2. 

Procedure-specific Pain Management
The Road to Improve Postsurgical Pain Management?
 Girish P. Joshi, M.B.B.S., M.D., F.F.A.R.C.S.I.,* Henrik Kehlet, M.D., Ph.D.,† *University of Texas Southwestern

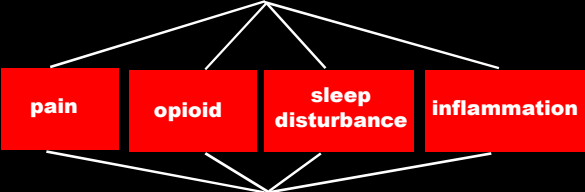
Br J Anaesth 2017; 119:720-2. 

Guidelines For Perioperative Pain Management: Need For Re-evaluation
 Joshi G, Kehlet H

dynamic, balanced analgesia is a prerequisite for optimal recovery

Acta Anaesthesiol Scand 2010;54:951-6 

New insights into the pathophysiology of postoperative cognitive dysfunction
 L. KRENK^{1,2,3}, L. S. RASMUSSEN¹ and H. KEHLET^{2,3}



modification → improvement ?

Acta Anaesthesiol Scand 2017;61:767-72. 

Delirium causing LOS > 4 days after fast-track hip and knee arthroplasty
 Petersen PB, Jørgensen CC, Kehlet H. & Lundbeck Collaborative Group

Langenbecks Arch Surg 2015;400:516-19. 

Delirium in fast-track colonic surgery
 Sorel Kurbegovic · Jens Andersen · Lene Krenk · Henrik Kehlet

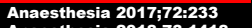

postop delirium no or minor transient problem with fast-track setup

patient blood management

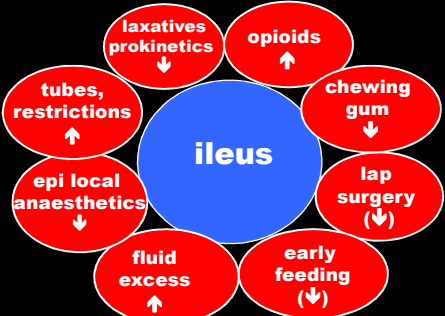
1st pillar **2nd pillar** **3rd pillar**

optimize hemato-poiesis **minimize blood loss and bleeding** **optimize tolerance of anemia**

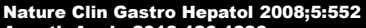
multidisciplinary team approach


Muñoz M et al.  2017;72:233
 Muñoz M et al.  2018;73:1418

reducing postoperative ileus



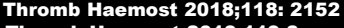

ileus

Kehlet Hedrick  2008;5:552
 Anesth Analg 2018;126:1896

Acta Orthop 2012;83:105-6. 

Should deep venous thrombosis prophylaxis be used in fast-track hip and knee replacement?
 Per Kjærsgaard-Andersen and Henrik Kehlet

studies with long LOS
immobilisation neglected as an important pathogenic mechanism
optimal prophylaxis ?

Petersen et al.  2018;118: 2152
 Samama  2019;119:3

Acta Orthop 2016;87:439-43. *Acta Orthopaedica*
Psychiatric disease as a risk factor in fast-track hip and knee replacement
 An overview of the literature
 Gylvin SH, Jørgensen CC, Fink-Jensen A, Kehlet H.

Acta Orthop 2016;87:437-8. *Acta Orthopaedica*
Hip and knee replacement—do we need to bother about psychiatry?
 Johan Raeder

- **psychiatric disease vs. psychopharmacologic treatment ?**
- **probably the drugs**

Gylvin et al. J Arthroplasty 2017;32:3611

Acta Orthop 2019;90:3-5 *Acta Orthopaedica*
Fast-track hip and knee arthroplasty – have we reached the goal ?
 Wainwright T. & Kehlet H.

- **LOS 0-2 days**
- **post-discharge pain / rehabilitation ?**
- **post-discharge cognitive dysfunction ↓**
- **thromboembolic morbidity ↓**
- **anaemia/ transfusion requirement ? !**
- **safety (morbidity ↓)**
- **costs ↓**

Ann Surg 2018;267:998-9. **ANNALS OF SURGERY**
A Monthly Review of Surgical Science Since 1859
ERAS implementation – time to move forward
 Kehlet H.

- **LOS ↓**
- **readmissions →**
- **morbidity ↓**
- **data from across procedures**

so what is the problem ?

JAMA 2019;321:1049-50. **JAMA**
 Enhanced Recovery After Surgery in the United States
 From Evidence-Based Practice to Uncertain Science?
 Memsoudis SG, Poeran J, Kehlet H. VIEWPOINT

“more focus on procedure-specific understanding of pathophysiology , neurohumoral alterations, volume homeostasis, pain mechanisms and minimal invasive surgery and avoiding recommendations based upon data from other surgeries”