Sedation, Analgesia, Nutrition

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MAQUET

Dräger medical
A Dräger and Siemens Company

„Der intensivmedizinisch behandelte Patient soll wach, aufmerksam, schmerz-, angst- und delirfrei sein, um an seiner Behandlung und Genesung aktiv teilnehmen zu können.“

Sedation

Sedation: Why?

- Enhance tolerance of endotracheal tube & mechanical ventilation
- Allow therapeutic & monitoring procedures
- Control cerebral oxygen demand
- Relieve anxiety

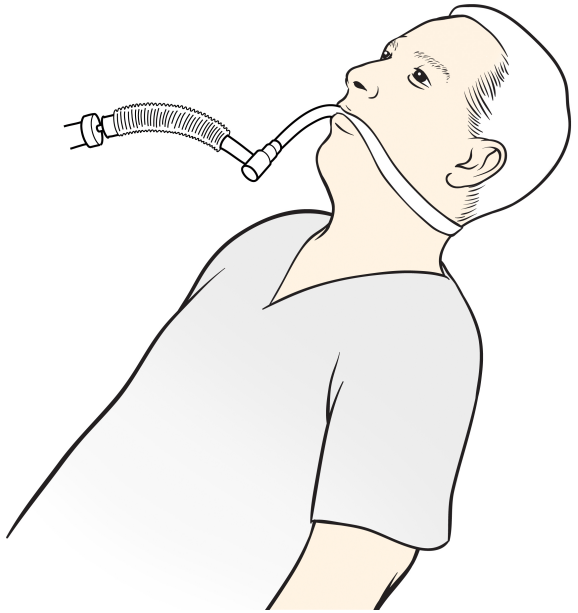
Sedation

- Pain
  - Analgesia not sedation
- Delirium
  - Treat cause
  - Anti-psychotic if necessary
  - Not sedation !!

Eine der bedeutendsten Präventionsstrategien des Delirs stellt die Vermeidung einer Sedation dar.

Sedation

- Appropriate level
  - Frequent repeated re-appraisal
  - In general lighter (but calm) better than deeper
  - Exceptions:
    - Difficult to ventilate
    - High ICP



Continuous infusion of sedative drugs…

- provides a more constant level of sedation
- may increase patients' comfort

... but

- prolong the duration of mechanical ventilation
- prolong the ICU lengths of stay
- increase costs
- increase the risk for developing delirium
- increase mortality

Kress JP. et al. (2000). Daily interruption of sedative infusion in critically ill patients undergoing mechanical ventilation. New England Journal of Medicine 342:1471-1477

ZIEL

Patientenorientiertes Behandlungskonzept zur bedarfsadaptierten Analgesie und Sedation zur Vermeidung von Angst und Delir mit individueller patientenspezifischer Festlegung von Therapiezielen

Systemic evaluation of pain and agitation...

- decreases
  - the incidence of pain and agitation,
  - the duration of mechanical ventilation
  - the incidence of nosocomial infection
  - ICU lengths of stay
  - mortality

Jakob, S.M., et al., Sedation and weaning from mechanical ventilation: effects of process optimization outside a clinical trial. J Crit Care, 2007. 22(3): p. 219-28

Changes G et al. Impact of systematic evaluation of pain and agitation in an intensive care unit. Crti Care Med. 2006 Jun. 34(6):1691-9

Sedation

- Titrate sedation to achieve appropriate level
  - Target sedation score may help
  - Beware decreased elimination due to organ failure
  - Consider drug pharmacokinetics

Evaluation of sedation

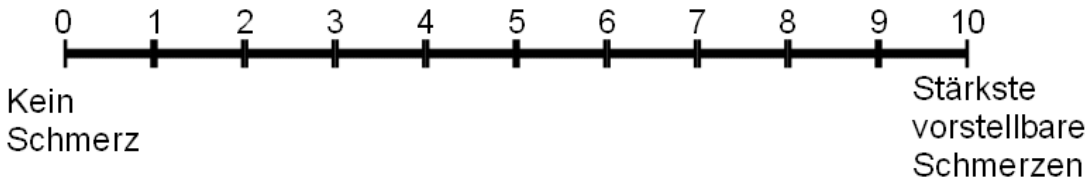
Medscape

Richmond Agitation and Sedation Scale (RASS)		
+4	Combative	violent, immediate danger to staff
+3	Very Agitated	Pulls or removes tube(s) or catheter(s); aggressive
+2	Agitated	Frequent non-purposeful movement, fights ventilator
+1	Restless	Anxious, apprehensive but movements not aggressive or vigorous
0	Alert & calm	
-1	Drowsy	Not fully alert, but has sustained awakening to *voice* (eye opening & contact ≥ 10 sec)
-2	Light sedation	Briefly awakens to *voice* (eye opening & contact < 10 sec)
-3	Moderate sedation	Movement or eye-opening to *voice* (but no eye contact)
-4	Deep sedation	No response to voice, but movement or eye opening to *physical* stimulation
-5	Unarousable	No response to *voice or physical* stimulation

Source: Pain Manag Nurs © 2009 W.B. Saunders

Evaluation of pain

- Numeric rating scale
- Behavioral pain scale
- ZOPA Score….



Sedation

- Consider adverse effects
  - Caution in haemodynamically unstable patients

Sedative Drugs

- Midazolam
  - Boluses: 1-2 mg
  - Infusion: 0-10 mg/h
- Propofol
  - Boluses: 10-20 mg
  - Infusion: 0-4 mg/kg/h
- Dexmedetomidin
- Clonidine, Ketamine…

Drugs: Analgetics

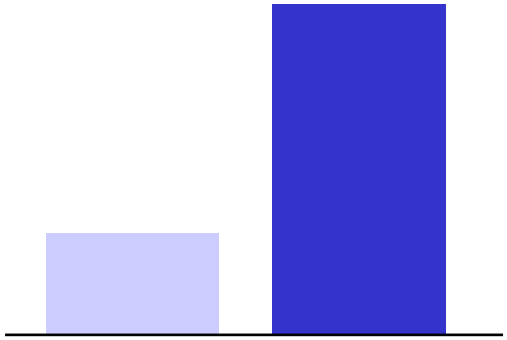
- Non-Opioid Analgetics
  - Paracetamol
  - Metamizole
  - NSAID
- Opioid Analgetics
  - Morphine
  - Sufentanil
  - Fentanyl
  - Remifentanil

Nutrition

How, what, when, how much?

Akutphase → Übergangsphase → Reparationsph.

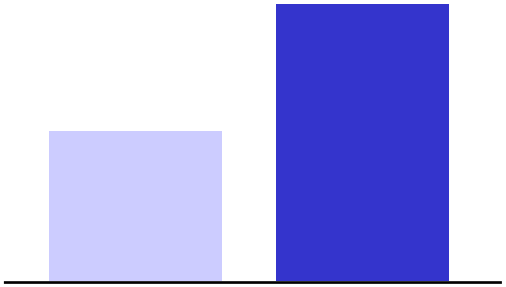
"Aggressionsphase"
Stunden



Insulin supprimiert antiinsulinäre Faktoren überwiegend

Keine Ernährung

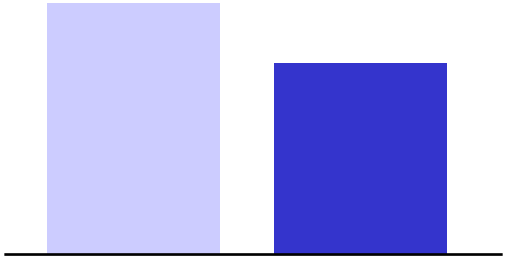
"Postaggressionsphase"
Tage



Insulin stimuliert antiinsulinäre Faktoren überwiegend

Stufenweiser Nahrungsaufbau

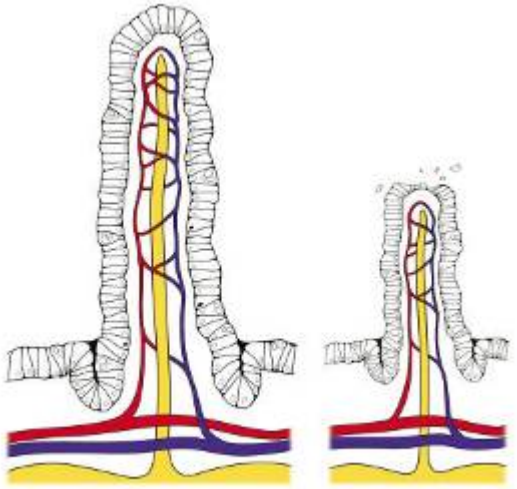
"Rekonvaleszenzphase"
Wochen



Insulin dominiert antiinsulinäre Faktoren normalisiert

Volle Ernährung

How?



- Enteral
  - May prevent atrophy and possible loss of barrier function
  - Gastroesophageal reflux
- Parenteral
  - Intravenous
  - Higher complication rate ??
  - indicated when enteral nutrition is not possible or has failed

How much?

- Basal energy expenditure (BEE, kcal/day) = 25 x Body weight (kg)
- Adjustment in hypermetabolic conditions
  - Fever: BEE x 1.1 (for each ^{0}C above the normal body temperature)
  - Mild to moderate stress: BEE x 1.2
  - Moderate to severe stress: BEE x 1.4
- Daily protein requirements
  - 1-2 g/kg
  - Hypercatabolism: 2-3 g/kg

How much?

- Commercial feed
  = 1-1.3 kcal/ml

Example: 70 kg x 25 kcal/d = 1750 kcal/d

(1750 kcal/d/1.3 kcal/ml)= 1340 ml/d

Parenterale Ernährung niereninsuffizienten Patieten

- Ohne Nierenersatzverfahren

Überlege höher konzentrierte Sondennahrung im Sinne einer Volumeneinsparung

- Mit Nierenersatzverfahren

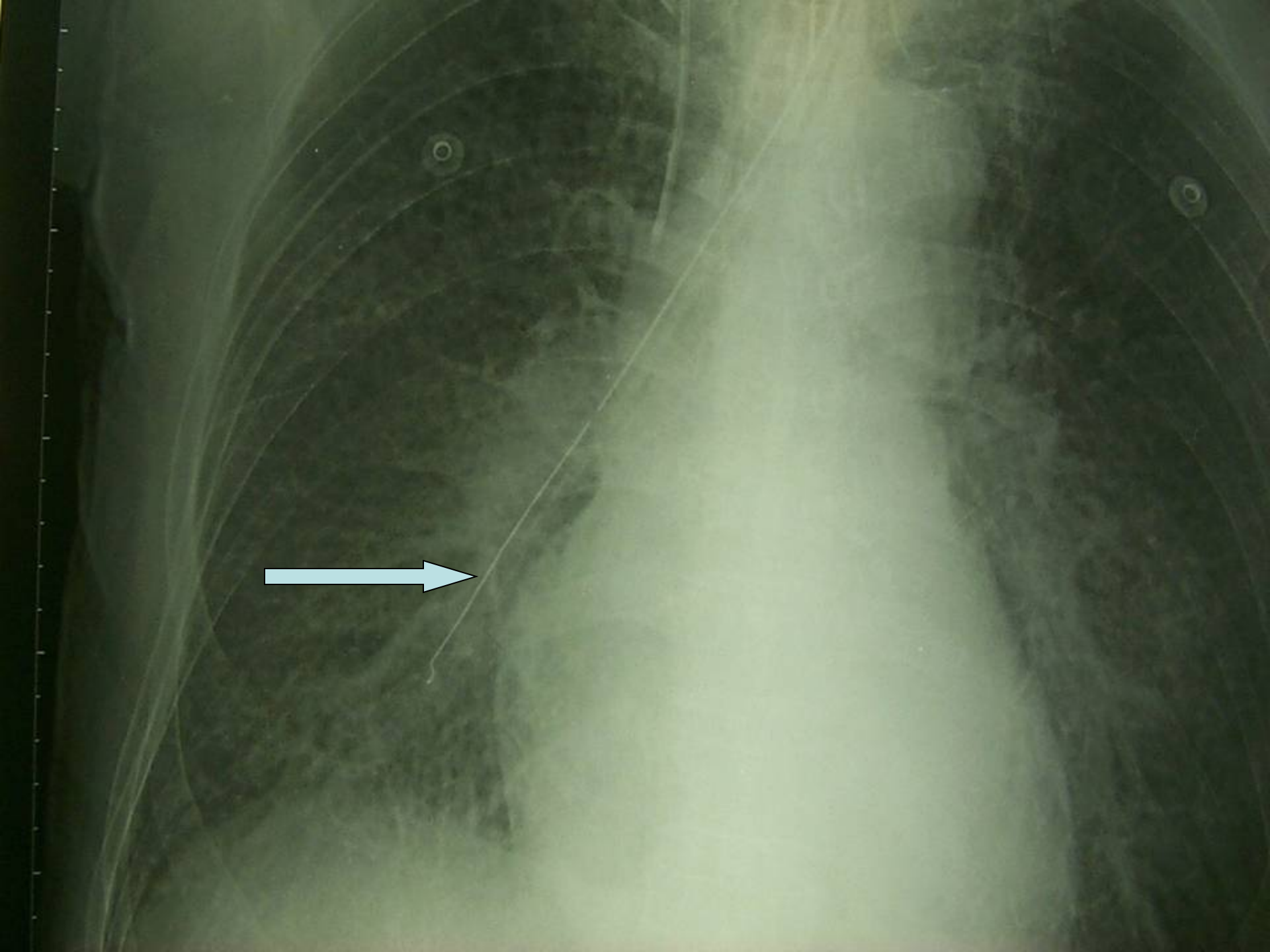
Denke an Elektrolyt- Spurenelement-, Vitaminverlust….

When?

- Enteral as soon as possible (24-48h)
- Early feeding
  - Reduced infection
  - Better wound healing
  - Prior malnutrition - feed earlier (1-2d)
- Parenteral – can wait 7 days

Practical aspects

- Insert feeding tube
  - Usually nasogastric
  - Check position on CXR

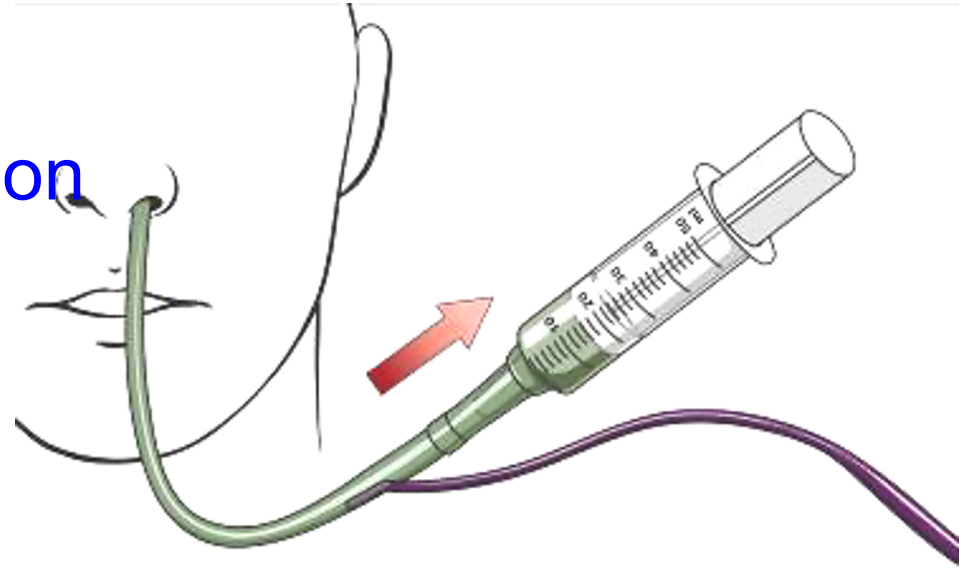


Practical aspects

- Start with 5 kcal/kg/h
- Aspirate NG every 4 hours
- Stop feeding if aspirate >200-400 ml
- Otherwise return aspirate to patient & continue feeding
- Full feeding within 48h

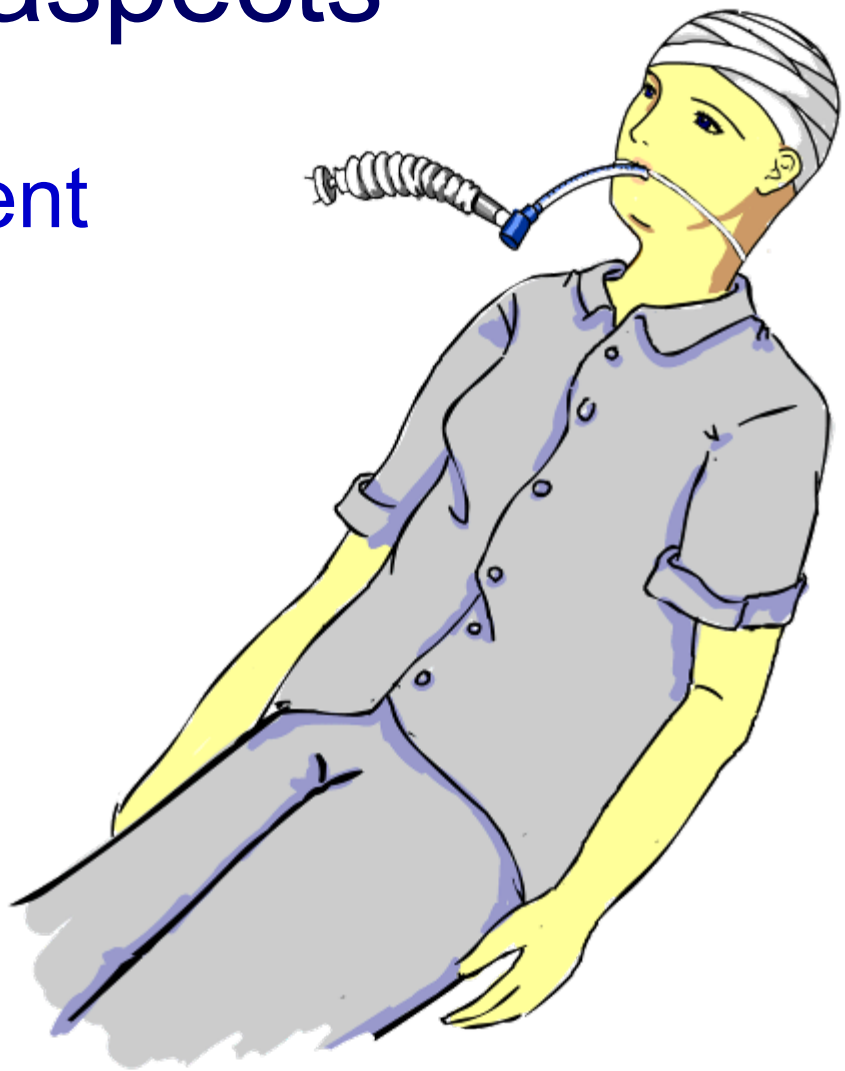
Practical aspects

- Signs of feed intolerance (poor specificity)
  - Poor gastric emptying
    - High residual volume
  - Abdominal pain
  - Abdominal distension
  - Diarrhoea



Practical aspects

- Feed in semi-recumbent position
  - 30° head up
  - Decrease aspiration/nosocomial pneumonia risk



Practical aspects

- Diarrhoea
  - Usually not due to feed
  - Consider drugs, *Clostridium difficile* colitis
  - If feed related may be due to:
    - Osmolality
    - Malabsorption

Any questions?