

Sondeernæring – sikkerhedsprocedurer og guidelines

Temamøde DSKE 10. Oktober 2013 ved Arla, Viby
Ernæring i klinikken - hvordan kan vi gøre det bedre og lære af erfaringen?

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Sikkert i land med enteral ernæring?

2.1 mill sonder årligt i Europa



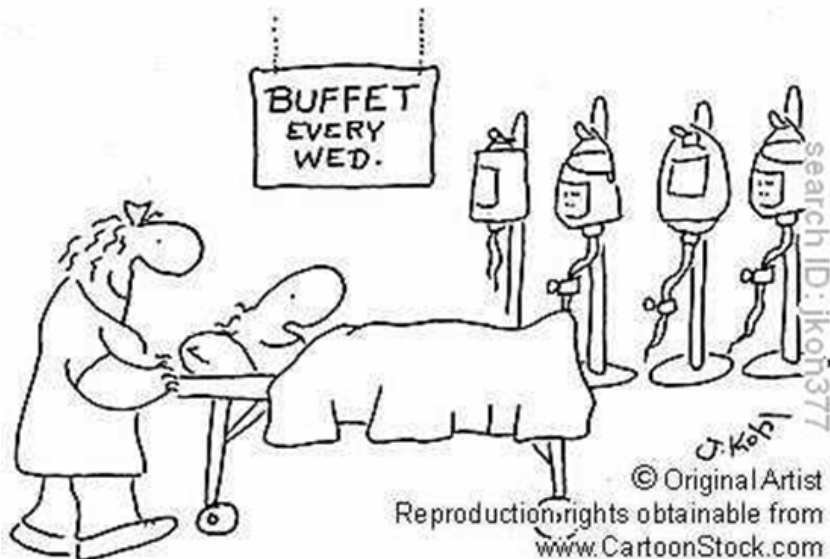
Agenda

- Til hvilke patienter
- Det juridiske
- Kvalitetsindikatorer
- Sikkerhed 1-2-3 (mm)
- Fremtidigt fokus



Ernæringssonde .. hvad?

- Ved fødesonde forstås enhver sonde, som gennem svælgget er anbragt i ventriklen, duodenum eller jejunum, og igennem hvilken der indgives væske, føde og/eller medicin.



Kvalitetsindikatorer

- En indikator er et operationelt mål for **kvalitet**, en **målbar variabel**, der alene eller sammen med andre indikatorer kan illustrere, hvis kvaliteten er i orden
(Sundhedsstyrelsen)
- En statistisk værdi, som angiver den tilstand eller retningen for udførelsen af en **proces** eller opnåelse af et **resultat** over tid
(Joint Commision International)
- Indikatorerne afspejler enten patient erfaring, professionelles erfaring, eller organisatoriske kvalitet
(Joint Commision International)

EN til hvem?

- Ernæringsrisiko jfr screening
- Utilstrækkeligt indtag eller sikkerhedsrisiko ved oral ernæring, f.eks dysfagi
- Funktionel mave-tarm
- Stoppes når tilstrækkeligt oral indtag kan opnåes

Guidelines for ernæringsterapi med enteral ernæring

Summary of statements: Chronic heart failure (CHF)

Subject	Recommendations	Grade ⁶⁸	Number
Indication	EN is recommended in cardiac cachexia to stop or reverse weight loss on the basis of physiological plausibility.	C	1.3
	There is no indication for enteral nutrition (EN) in the prophylaxis of cardiac cachexia.		1.4
Contraindications	There are no specific contraindications. Avoid fluid overload.		1.6

Grade: Grade of recommendation; Number: refers to statement number within the text.

Summary of statements: Chronic obstructive pulmonary disease (COPD)

Subject	Recommendations	Grade ⁶⁸	Number
Indication	There is limited evidence that COPD patients profit from EN per se.	B	2.3
	EN in combination with exercise and anabolic pharmacotherapy has the potential to improve nutritional status and function.		2.3
Application	Frequent small amounts of oral nutritional supplements (ONS) are preferred to avoid postprandial dyspnoea and satiety and to improve compliance.	B	2.5
Type of formula	In stable COPD there is no additional advantage of disease specific low carbohydrate, high fat ONS compared to standard high protein or high energy ONS.	B	2.5

Grade: Grade of recommendation; Number: refers to statement number within the text.

ESPEN Guidelines: EN anbefales ved

Diagnose / tilstand	Rekommendation	Evidensgrad
Crohns sygdom	Når steroid beh ikke mulig Ern risiko/ opbygge ET Inflammeret stenose Før OP ved vægttab	A A/C C C
Geriatrici	Skrøbelige. Opbygge ET Neurologisk dysfagi Depression, - motivation Demens (EN el ONS)	B A C C
Svære infektionssygdomme og HIV	Vægttab <5% ON og EN BMI< 18.5 Diarre modvirker ikke en positiv effekt af ernæring EN og PN har samme effekt EN har positiv effekt på diarre frekv og konsistens	B A A A
Intensiv	Ikke forventet fuld ON dag 3 Katabol fase 20-25 kcal/bw/dg Anabol og underernærede 25-30 kcal/dg Undgå PN hvor fuld EN mulig	C C C A
Kronisk og akut nyresygdom	ON og rådgivning ikke tilstrækkelig / mulig HD specifik formel	C C
Alkoholisk steatohepatitis	Når tilstrækkelig ern ikke kan opnås med ON/ONS (også oesophagusvaricer) Hyper energi/ Hyper protein Undgå PEG BCAA tilskud ved udtalt cirrose (?)	A C B

Cancer

- Tidlig EN til cancerpt i ernæringsrisiko (elektiv kirurgi) reducerer indlæggelsestid
- Flere GI **gener** hos EN pt fremfor PN
- Oesophagus cancer til kurativ kirurgi: EN associeret til bedre ET og reduceret postoperativ respiratoriske komplikationer

Øvre GI-cancer kirurgi og pancreas:

- EN reducerer indl tid og sværhedsgrad af infektioner
- EN tilsat arginin, n-3 fedtsyrer, nucleotider reducerer c-pulm kompl og anastomoselækager mod standard EN og TPN

Utilstrækkeligt indtag?

Patienter

Aktive gruppe

Fælles for
begge grupper

Passive gruppe

Risikofaktorer

Kender grunde til at de
ikke spiser, men
forventer ingen hjælp
fra personale

Bivirkninger til medicin

Selvbestemmelse
Sætter sig mål hvis
motiverede

Smerter
Kvalme
Ingen appetit
Smagsforstyrrelse
Alene

Træthed
Ligegyldighed
Mgl koncentration
Mgl Hukommelse
Deprimeret

Intervention

Motiveres ved:
Aktiv involvering

Målsætning og
opfølgning
f.eks kostindtag og
mobilisation

Opmærksomhed fra læge
og plejers:
Finde og behandle årsager
til ringe kostindtag

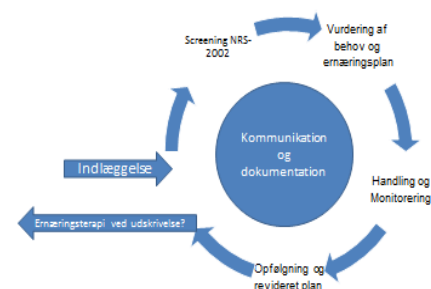
Motivation ikke mulig
Mere hjælp behov
Plejepersonalet aktive
ifht kostindtag og gener
Ofte behov for EN/PN

Hvornår EN??

(det altid sværeste spørgsmål)

- Evidens..
- Åbenlyst (dysfagi / hoved-hals kirurgi etc)
- Kostregistrering
- Risikofaktorer undersøgt, vurderet og korrigeret (så vidt muligt)
- Patienten informeret før behandlingen

Ernæring i praksis



Nutrition Care Process- EN



Patient needs
Enteral Nutrition

**Screening &
Assessment of
risk factors**

Admittance

Discharge

Audit

Requirements met?
Adverse events?

**Follow up
Revision of plan
Communication**

**Action and
monitoring**

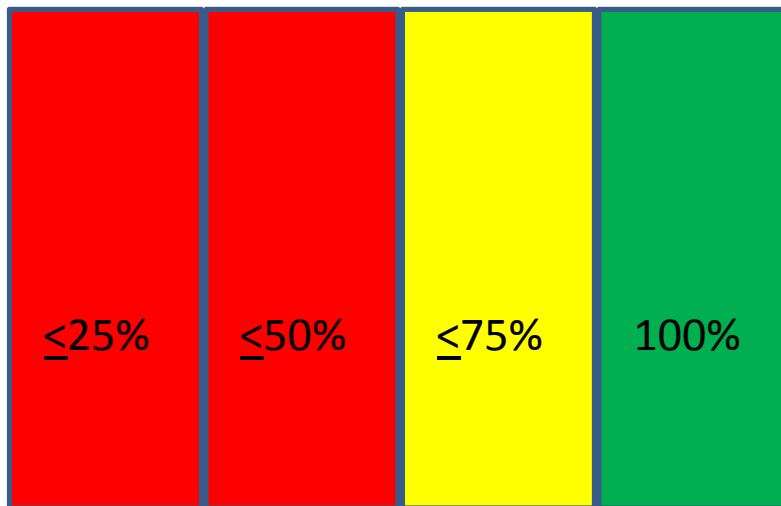
Placement controlle
Administration
Monitoring of EN/ON/PN
Documentation

**Requirements
Nutrition plan
Safety
management**

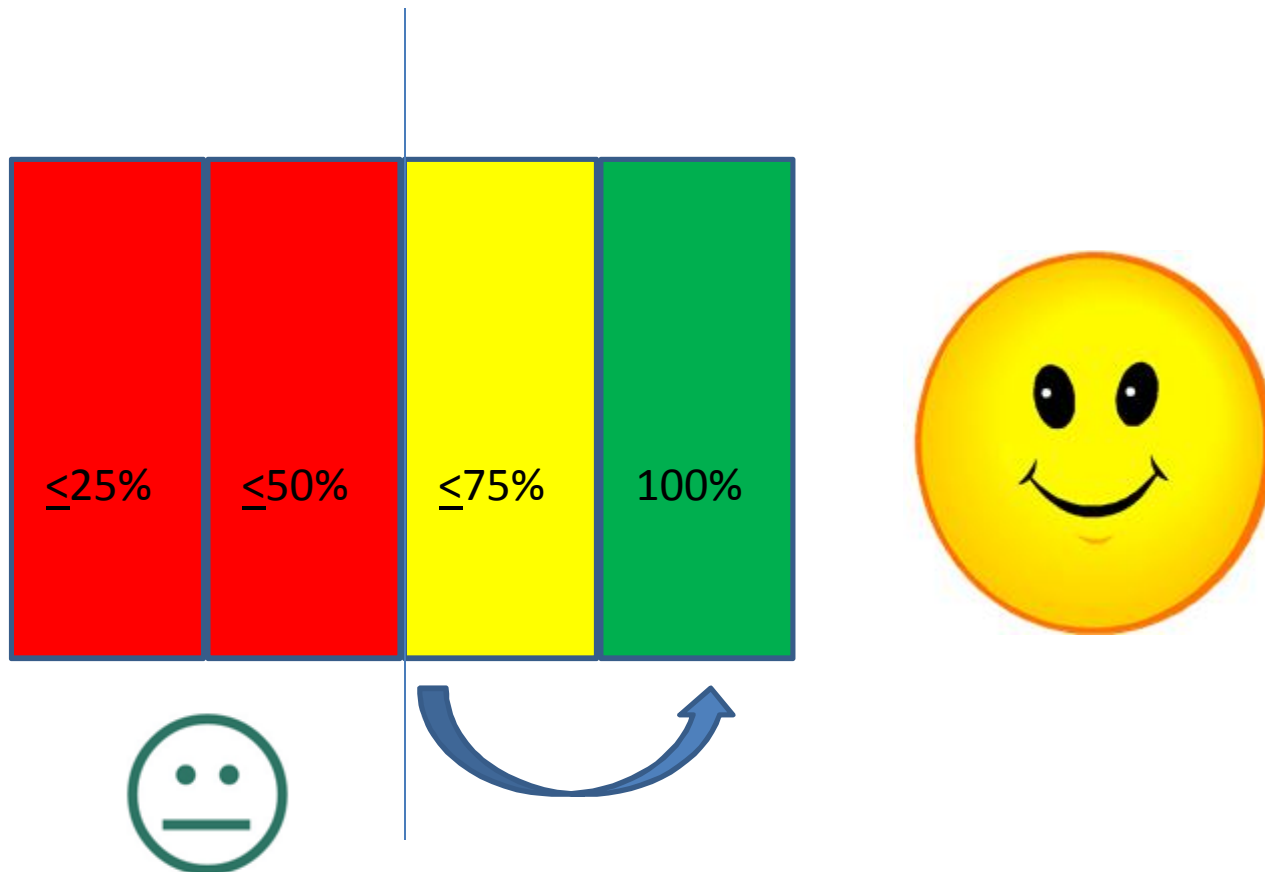
Requirements
Feeding technique
Which product?
Combi therapy?
Placement control method
Safe daily management



Kostindtag erfaringer MORE + Kræsevogn



Kostindtag erfaringer MORE + Kræsevogn



Association mellem indtag og død

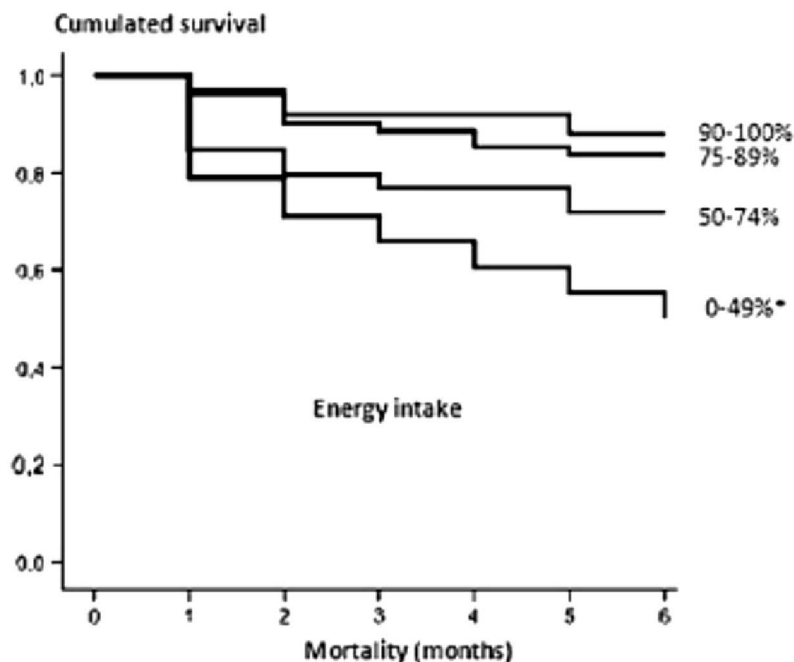


Fig. 1. Cumulated survival (Kaplan-Meier plot) within 6 months after discharge from three medical departments compared to energy intake.

Patienter som indtog $\leq 50\%$ af energi =
4 X øget dødelighed < 6 mdr ($p=0,002$)

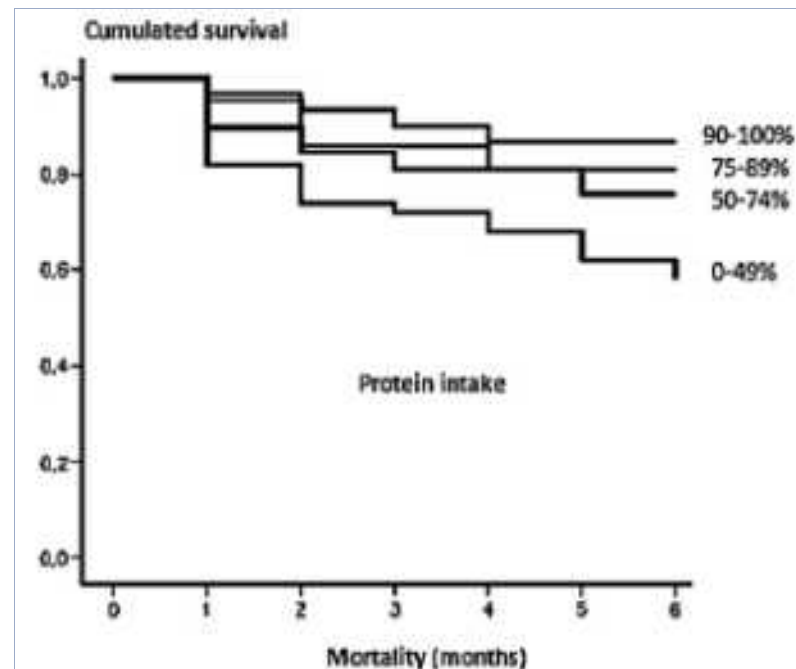
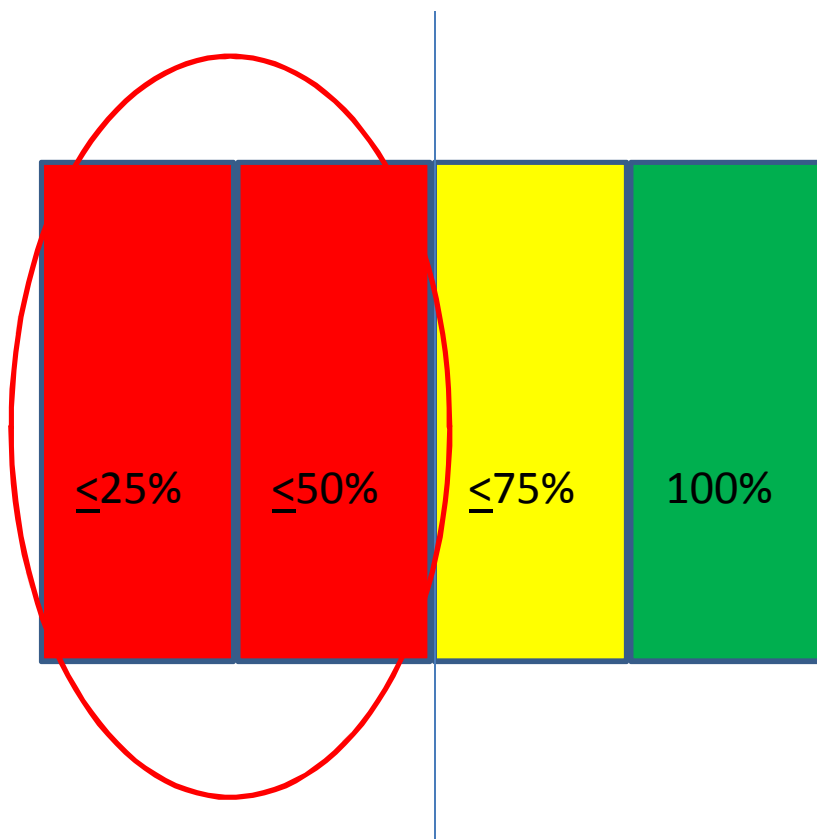


Fig. 2. Cumulated survival (Kaplan-Meier plot) within 6 months after discharge from three medical departments compared to protein intake.

Patienter som indtog $\leq 50\%$ af protein =
3 X øget dødelighed < 6 mdr ($p=0,002$)

Øge fokus på EN (og måske PN) ved 0-50%?



Sonden- hjælp eller overgreb?

- MORE studiet Aalborg: 82% af 381 patienter ville modtage sondeernæring hvis deres for kostindtag øgede deres risiko for komplikationer.
- Tilsvarende undersøgelse i 2008: 90%



Det juridiske: Lægeordination og journalføring

- Anlæggelse af fødesonder må **kun foretages efter lægeordination** for den pågældende patient. Selve anlæggelsen af fødesonden og kontrol af placeringen kan delegeres til andre sundhedspersoner, som har den **fornødne kompetence**. Denne kompetence kan være opnået på en uddannelsesmæssig baggrund eller kan være opnået på baggrund af fornøden undervisning og instruktion.
- **Ordination af behandling med fødesonde, kontrolprocedurer i forbindelse med anlæggelsen og den efterfølgende kontrol skal journalføres.**
- På sygehusafdelinger, hvor der kan være indikation for akut anlæggelse af fødesonde, her tænkes særligt på **neonatal-, barsels- eller børneafdelinger**, kan den administrerende overlæge delegere stillingtagen til ordination af anlæggelse af fødesonde til andre sundhedspersoner med den **fornødne kompetence med hensyn til vurdering af indikationer, kontraindikationer og risici mv.**



Patient Safety Alert

NPSA/2011/PSA002
10 March 2011



National Patient
Safety Agency

Reducing the harm caused by misplaced nasogastric feeding tubes in adults, children and infants

This Alert updates and strengthens Patient Safety Alert 05 (*Reducing the harm caused by misplaced nasogastric feeding tubes*) and is based on national learning since then. It does not replace *Reducing the harm caused by misplaced naso and orogastric feeding tubes in babies under the care of neonatal units*, issued in August 2005.

Patient Safety Alert 05 provided guidance for the NHS on checking and confirming that a nasogastric tube had been inserted into the right place, i.e. the stomach.

This followed reports to the NPSA's National Reporting and Learning System (NRLS) of patient death as a result of feeding into the lung through misplaced nasogastric tubes.

Since the completion date for that Alert's actions (1 September 2005), the NRLS has received reports of a further **21 deaths** and **79 cases of harm** due to feeding into the lungs through misplaced nasogastric tubes. The main causal factor leading to harm was misinterpretation of x-rays. This was found in 45 incidents, 12 of which resulted in the death of the patient. The focus for this new Alert therefore supports safe x-ray interpretation.

Other causes of harm related to failure to follow the guidance in Patient Safety Alert 05 including: feeding despite obtaining aspirate between pH6 and pH8 (seven incidents including two deaths), instilling water down the tube before obtaining aspirate (two incidents), no checking of tube placement by any method (nine incidents including one death). A repeated finding in local investigations was that no written record was made of pH obtained or of x-ray interpretation before feeding commenced^{1,2,3}.

This Alert does not change the advice given in Patient Safety Alert 05 that pH testing remains the first line test, and x-ray checking remains the second line test.

For the purpose of this Alert the definition of 'to feed' and 'feeding' includes the introduction of any feed, liquid or medication through the nasogastric tube.

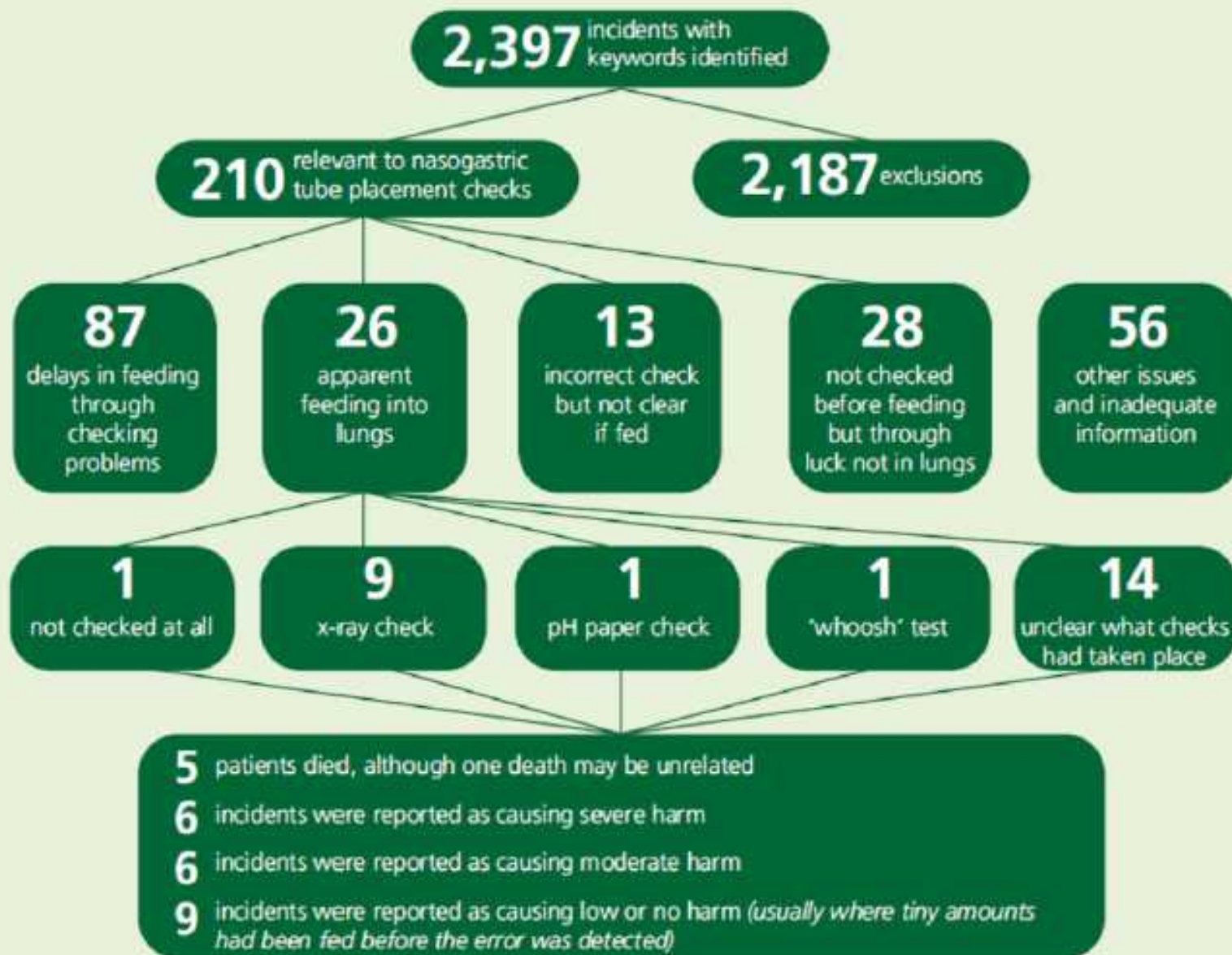
Action for the NHS

For action by all organisations in the NHS and independent sector where nasogastric feeding tubes are placed and used for feeding patients.

An executive director, nominated by the chief executive, working with relevant medical and nursing staff should ensure, through reviewing policies, procedures and staff training that by **12 September 2011**:

1. A named clinical lead is assigned to have responsibility for implementing all actions in this Alert.
2. All policies, protocols, and bedside documentation are reviewed to ensure compliance with steps (a) to (j) outlined on page 2 every time a nasogastric tube is inserted and used to administer medication, fluids or feed.
3. An ongoing programme of audit is put in place to monitor compliance.
4. Staff training, competency frameworks and supervision are reviewed to ensure that all healthcare professionals involved with nasogastric tube position checks have been assessed as competent. Competency training should include theoretical and practical learning. An example eModule training tool for x-ray interpretation of nasogastric tube position is available at www.trainingngt.co.uk (in addition refer to guide to interpretation on page 3 of this Alert).
5. Purchasing policies are revised and old stock systematically removed to ensure all nasogastric tubes used for the purpose of feeding are radio-opaque throughout their length and have externally visible length markings.
6. Purchasing policies are revised and old stock systematically removed to

Misplacement



Quality indicators for enteral nutrition(ICU)

Table 1 – Quality indicators used

Indicator	Formula	Target
Frequency of energy and protein needs measurement or estimation in NT patients	$\frac{\# \text{ patients with energy/protein expenditure measured} \times 100}{\text{total NT patients} \#}$	>80%
Frequency of inappropriate fasting time patients before NT start (>48h)	$\frac{\# \text{ patients fasting} > 48\text{h candidate to NT} \times 100}{\text{total} \# \text{ of NT candidate patients}}$	<80%
Frequency of inadvertent enteral tube displacement in ENT patients	$\frac{\# \text{ of inadvertent enteral tube displacements} \times 100}{\text{total} \# \text{ of ENT patients} \times \text{days with enteral tube}}$	<5% in ICUs
Frequency of days with caloric offer given > or <20% of the total prescribed in the total ENT patients days	$\frac{\# \text{ of inappropriate caloric offer days} \times \# \text{ of patients receiving inappropriate caloric offer} \times 100}{\text{total number of days in the evaluated period} \times \# \text{ of NT patients in the evaluated period}}$	<20%
Frequency of days with insufficient protein offer in the total ENT patients days	$\frac{\# \text{ of days with insufficient protein offer} \times \# \text{ of patients receiving insufficient protein offer} \times 100}{\text{total} \# \text{ of days in the evaluated period} \times \# \text{ of patients receiving NT in the evaluated period}}$	<10%
Frequency of diarrhea episodes in ENT patients*	$\frac{\# \text{ of days with diarrhea} \times 100}{\text{total} \# \text{ of ENT days}}$	<10%

NT – nutritional therapy; ENT – enteral nutritional therapy; ICU – intensive care unit.

Source: Clinical Nutrition Taskforce (ILSI Brazil, 2008)¹² Formula adapted.

Risici

1. Kontrol efter sondens anlæggelse
2. Kontrol inden indgift
3. Får patienten den rette mængde (pauser)
4. Får patienten rette medicin / ordination af forkerte præparater
5. Forvekslinger af sprøjter og "misconnections"
6. Skal hovedgærdet eleveres under indgift, og hvor længe efter?

Sikkerhed jfr Guidelines

Nasogastric tube safety in placement and management—do guidelines agree?

Indicator	NICE	NPSA	ASPEN	ESPEN
Assessment prior to Prescribing EN	√	√	√	√
Local protocols	√	√	%	%
Insertion skills	√	√	√	%
X-ray after insertion	√	√	√	%
Aspiration and PH before each use	√+Local protocol for when asp not possible	√	√	%
X-ray before use	When nessesary	When nessesary	When nessesary	%
Exit site centimeter markings and obs	%	√	√	%
Auscultatory method	%	%	Do not rely on	%
Elevate HOB			≥30°	%
Tjeck misconnections	%	%	√	%
Documentation for all tube checks	%	√	%	%
Audit	%	√	%	√

Sikkerhed: Kontrolprocedurer

- Den **ordinerende læge skal tage stilling til, hvilken kontrolprocedure der skal anvendes**, både ved anlæggelse af sonden, og ved de efterfølgende kontroller. På sygehusafdelinger skal dette ske under hensyntagen til afdelingens instruks.
- Placeringen skal kontrolleres **efter anlæggelse og inden enhver indgift i fødesonden**. Ved kontinuerlig indgift bør placeringen **kontrolleres tre gange i døgnet**, og altid ved mistanke om displacering. I tvivlstilfælde skal en læge tage stilling til en eventuel røntgenkontrol inden indgift.
- Kontrol kan foregå på flere forskellige måder. **Sundhedsstyrelsen skal gøre opmærksom på, at ingen af de i dag anvendte kliniske kontrolprocedurer alene sikrer en korrekt placering af en peroral fødesonde. Røntgenundersøgelse, med indgivelse af kontrast såfremt fødesonden ikke er røntgenfast, må anses for at være den sikreste kontrolprocedure.**
- Muligheden for røntgenkontrol er ikke tilgængelig alle steder, og **i en række tilfælde vil der være forhold ved den enkelte patients situation, der medfører, at røntgenkontrol er uhensigtsmæssig.** Det kan eksempelvis dreje sig om, at sondeanlæggelse skal ske så hyppigt, at patienten ville blive udsat for en for stor stråledosis ved gentagne røntgenkontroller.
- **Undersøgelsen verificerer alene sondens placering på selve undersøgelsestidspunktet**, og man skal altid være opmærksom på, at fødesonden efterfølgende i sjældne tilfælde kan displaceres. Derfor er observation af patienter med fødesonder af stor vigtighed.

Table 1. Policies for Assessing Placement of Enteral Feeding Tubes at 28 New England Hospitals

Assessment method ^a	Number of policies incorporating method
Inject air while listening with a stethoscope for a whooshing sound below the diaphragm as the air enters the stomach	17 ^b
Aspirate gastric contents	13
Confirm newly inserted nasogastric feeding tube by X-ray before feeding or medication administration	12
Mark tube at the point of entry into the nares and measure length of the tube's visualized portion	9
Use at least two methods to verify tube placement before feeding or medication administration	9
Assess residual volume of gastric aspirate	9
Check pH of gastric aspirate	5 ^c
Visually assess gastric aspirate	4
Consult current nursing textbook	4
No formal policy for assessing enteral feeding tubes in adult patients	4
Ask patient to hum or speak	1
Listen for crackling noise and feel for stream of air at end of tube	1
No formal policy for assessing enteral feeding tubes in adult or pediatric patients	1
Test for glucose in sputum	1

^aMethods were not exclusive except as noted.^bFour policies used this method as the sole means of assessing tube placement.^cOne policy used this method as the sole means of assessing tube placement.

Table 2. Comparison of Feeding Tube Placement Methods

Assessment method	Advantages	Limitations
X-ray visualization of tube	Most reliable method currently available ^{19, 20}	Costly, undesirable patient exposure to repeated X-rays, not always practical
pH testing of aspirate	Ease of use, reliable, can be used to distinguish between gastric and intestinal tube placement ^{17, 21-23}	Continuous gastric feeding and medications for ulcers and reflux raise gastric pH, possibly falsely indicating that the tube is not in the stomach ²⁴⁻²⁶
Visual assessment of aspirate	Useful in distinguishing between gastric and intestinal tube placement ²⁷	Color and consistency of aspirate varies, of little value in differentiating between gastric and respiratory placement ²⁸
Visualization of external tube length	Ease of use, may indicate if tube placement has shifted ^{29, 30}	Doesn't indicate location of tube, should never be used as sole means of determining placement ²⁷
Auscultation of air insufflated through the feeding tube for whooshing sounds	None ^{19, 31}	Highly unreliable, whooshing sound can be heard if tube is incorrectly placed in the lung ^{15, 16, 18, 19, 31}

Management of tubes

- 1.7.16 People requiring enteral tube feeding should have their tube inserted by healthcare professionals with the relevant skills and training. **D(GPP)**
- 1.7.17 The position of all nasogastric tubes should be confirmed after placement and before each use by aspiration and pH graded paper (with X-ray if necessary) as per the advice from the National Patient Safety Agency (NPSA 2005). Local protocols should address the clinical criteria that permit enteral tube feeding. These criteria include how to proceed when the ability to make repeat checks of the tube position is limited by the inability to aspirate the tube, or the checking of pH is invalid because of gastric acid suppression. **D(GPP)**
- 1.7.18 The initial placement of post-pyloric tubes should be confirmed with an abdominal X-ray (unless placed radiologically). Agreed protocols setting out the necessary clinical checks need to be in place before this procedure is carried out. **D(GPP)**

Issue date: February 2006

Nutrition support in adults

Nutrition support in adults: oral nutrition support, enteral tube feeding and parenteral nutrition

Kontrol efter anlæggelse

Røntgen. Førstevalgs kontrol, men:

- Fortolkningsfejl
- Viser kun aktuel placering
- Ventetid  Manglende tid til ernæring
- Transporttid
- Ikke indlagte
- Radioforurening

Fejlagtige sammenkoblinger

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Table 1. Data on Enteral Tube Mismatches From Case Studies

Case Reports	Patient Outcome From 116 Cases	Threats Identified From 32 Reports	Recommendations From 32 Reports
(N = 116 in 34 reports) Patients • Adult (N = 60) • Child/infant (N = 30) • Not specified (N = 26)	Death (N = 21) Survival • Hypersensitivity and hypercoagulopathy reaction (N = 1) • Septicemia/sepsis (N = 16) • 2 with neurologic damage • 2 with respiratory arrest • 33 with hypoxia • 1 with seizure and hypoglycemia • 5 with intracranial hemorrhage • Renal impairment (N = 8) • Respiratory arrest/distress (not listed above) (N = 2) • Neurologic damage (not listed above) (N = 2), 1 with blindness and deafness • No harm or outcome not given (N = 12)	• Similar appearance of enteral feeds and IV infusion (N = 6) • Compatible (luer) tubing connectors (N = 15) • Enteral pumps and IV pumps • On same IV pole • Identical in appearance or used interchangeably • Tubes running from pumps which look the same (N = 5) • Inadequate lighting (N = 2) • Lines • Confused • Use of tubes or catheters for unintended purposes • Placing functionally dissimilar tubes in close proximity to one another (N = 5) • Using luer lock syringes instead of oral syringes and unlabeled syringes (N = 1) • Human factors • Knowledge deficit • Confusion • Fatigue • Mistake (N = 11) • Modified tubing connector (N = 1)	• Write the order in full (N = 1) • Redesign connectors to prevent misconnection (eliminate cross-system-compatible connectors) (N = 22) • Visual cues • Label or color to indicate system and contents • Place catheters and tubing for differing systems on different sides of patient's body (N = 7) • Use oral syringes for feedings (N = 2) • Modify human factors through • Training • Changes in policies and protocols • Routinely trace lines back to source/increased vigilance • Increased supervision • Double checks (N = 6) • Other equipment modifications • Use an IV-incompatible NG tube and administration set • Use different pumps for different purposes, when possible (N = 1)

Medical administration error

In 2129 hospitalized patients.
Error in 817 patients
313 patients with dysphagia

	Patients without dysphagia	Patients with dysphagia	
Normalized frequency of MAEs when analysed at drug level	5.9% (95% CI = 4.7-7.1)	21.1% (95% CI = 18.0-24.1)	
Normalized number of patients experiencing at least one MAE	13.8% (95% CI = 10.5-17.2)	32.6% (95% CI = 26.2-38.9)	
Normalized number of patients who experienced at least one MAE		Without enteral tube	With enteral tube
		25.3% (95% CI = 18.6-32.0)	56% (95% CI = 42.2-69.8)

Medical administration error In 56% of dysphagia patients with enteral tube

Årsager til pause med EN

P196

UNDELIVERED CALORIES IN ENTERAL NUTRITION: WHERE'S THE PROBLEM?

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D.C. Magnoni¹, C. Cukier¹. ¹Nutritional Time, ²ICU, Sao
Camilo Santana Hospital, São Paulo, Brazil

Rationale: Fasting time caused by interruptions in enteral feeding is a common cause of inadequate calorie intake. General procedures as diagnosis exams, surgeries, as far as gastrointestinal impairments are related with fasting long-time and diminished enteral diet infusions. The aim of this study was to define the main causes of fasting, emphasizing what issues need more attention to avoid loss of calories.

Methods: 658 patients were evaluated daily by a nutritional team during 2008 in a general hospital in São Paulo, Brazil. All patients had been receiving enteral nutrition in controlled continuous infusion, it was collected some

Only 10% of calories prescribed were not administered.

Causes for not meeting requirements

"No programmed pause"	63%
Image diagnostic procedures	16%
Surgical procedures	9.6%
Gastrointestinal complications	7%
Exchange feeding tubes	6%
Respiratory tube procedures	2.6%
Haemodynamic instability	1.3%

Andre årsager

PP375

RISK FACTORS FOR DISCREPANCY BETWEEN PRESCRIPTION AND DELIVERY OF ENTERAL NUTRITION

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Rationale: Discrepancies between the optimal and the actually delivered enteral nutrition (EN) have been reported. This prospective observational study addresses the procedures and complications that result in discrepancy between EN prescribed and EN actually delivered to ward and critically ill, surgical and medical patients.

Methods: Two hundred ward and ICU patients receiving exclusively EN were followed for up to 21 days. The caloric target was estimated by the Harris-Benedict equation. Only physicians that are certified specialists in enteral and parenteral nutrition made the prescriptions. All patients received industrialized, open-system enteral formulae. Causes for not receiving full amount of tube feed were non-mutually excluding. Data was analyzed by Fischer's test and risk estimates were measured.

Results: Forty ward (20%) and 160 ICU patients were enrolled. Eighty percent of the targeted feed volume was achieved on day 4 in 79% of the patients. Thus, consider-

80% aschieved on day 4, in 79%

Causes for not meeting requirements	OR
Logistics	64.5
Unknow causes	47.6
High gastric residue	29.2
Accidental loss of feeding tube	28.1
Unexpected delay in EN delivery	27.4
Patient refusal to treatment	24.1
Obstruction of feeding tube	20.3
External physician interference	17.3
Abdominal distension	10.2
Vomiting	8.0
Diarrhea	3.0

Måling af PH

En pH-værdi på mellem 1 og 5,5 er pålidelig bekræftelse af, at slangen ikke er i lungerne

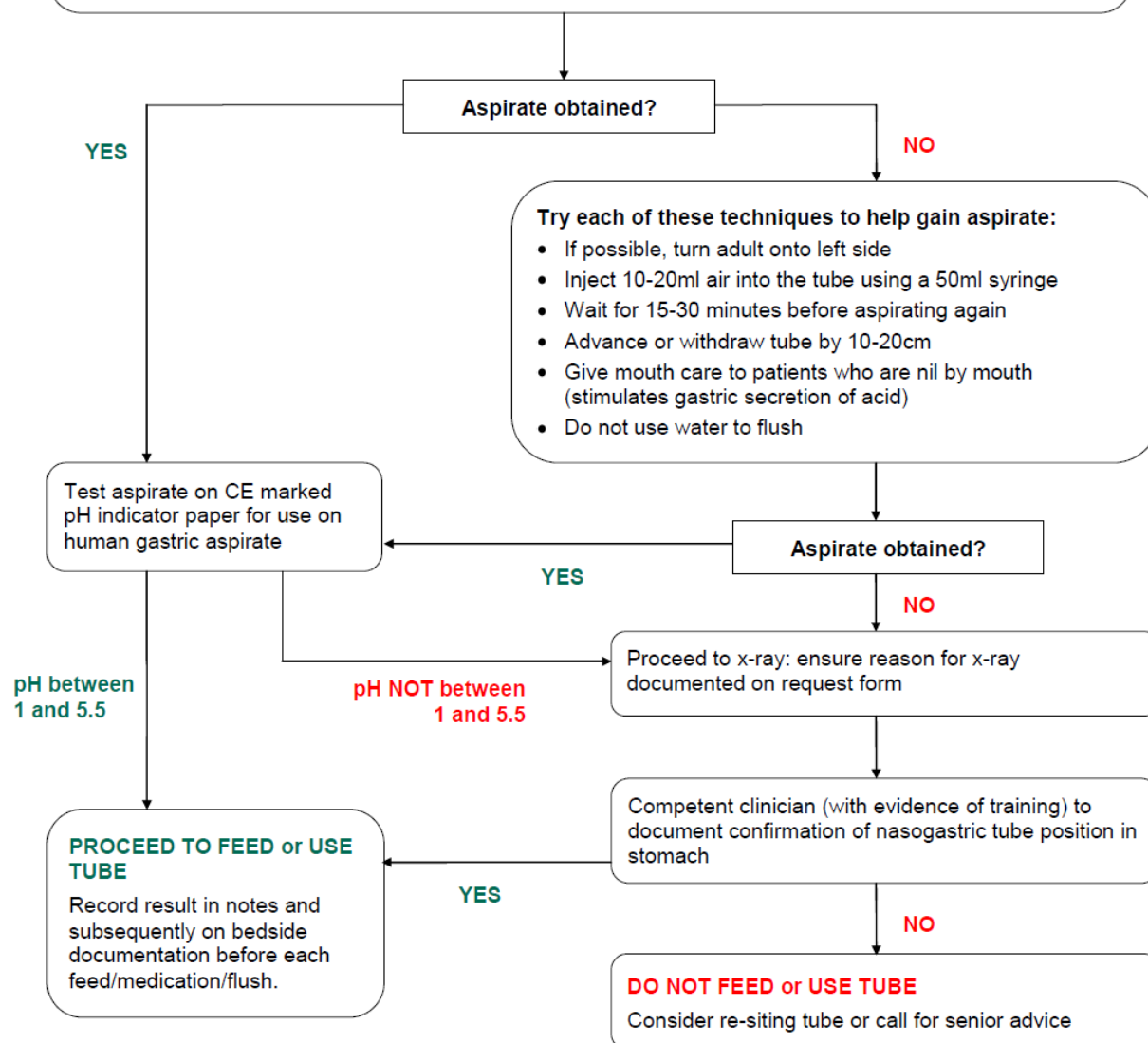
Det bekræfter IKKE gastrisk placering, da der er en lille chance røret spidsen kan sidde i spiserøret, hvor det bærer en højere risiko for aspiration

Hvis dette er nogen bekymring, bør patienten fortsætte til røntgen for at bekræfte positionen

Hvor pH-aflæsninger falder mellem 5 og 6 er det anbefales, at en anden kompetent person aflæser eller retester.

Decision tree for nasogastric tube placement checks in **ADULTS**

- Estimate NEX measurement (Place exit port of tube at tip of nose. Extend tube to earlobe, and then to xiphisternum).
- Insert fully radio-opaque nasogastric tube for feeding (follow manufacturer's instructions for insertion)
- Confirm and document secured NEX measurement
- Aspirate with a syringe using gentle suction



Kan pH måles på tynde ernæringssonder i praksis?

- Apopleksiafsnit Aalborg Universitetssygehus:
 - Bruger kun bolus-administration
 - Tester Mærke på sonden udenfor næsefløj og noterer cm.
 - Måler pH
 - Angiver aspiratets farve
- Alle mål pH 1-5.5 (4-7 ved pantoprazol beh)
- *Problem ved:* Kontinuerlig indgift; pantoprazol beh; enkelte hvor aspirat ikke kan ophentes

Andre Undersøgelser om ph måling

Results: At cut off pH 5 the average number of correct answers was 92%. At pH 5.5 it was 90%. This was not significant $P = 0.6$. The sensitivity & specificity and positive & negative predictive value for each indicator are shown in the table. None of the differences were statistically significant.

	% Correct		Sensitivity		Specificity		PV+		PV-	
	pH5	pH5.5	pH5	pH5.5	pH5	pH5.5	pH5	pH5.5	pH5	pH5.5
Fisherbrand	96	98	0.96	0.96	0.96	1	0.96	1	0.96	0.95
Merck 0-6 CE	79	65	1	1	0.75	0.81	0.83	0.62	1	1
Merck 2-9 CE	88	68	1	1	0.74	0.74	0.83	0.64	1	1
Medicina CE	86	84	0.76	0.74	0.97	0.98	0.97	0.98	0.77	0.74
Enteral UK CE	95	97	0.96	0.96	0.95	0.98	0.96	0.98	0.95	0.95
Alkazine	95	96	0.96	0.95	0.95	0.98	0.96	0.98	0.95	0.93
Merck 0-6 P	96	97	0.96	0.96	0.96	0.98	0.96	0.98	0.96	0.95
Merck 2-9 P	96	97	0.96	0.96	0.96	0.98	0.96	0.98	0.96	0.95
Merck 4-7 P1	96	97	0.96	0.96	0.96	0.99	0.96	0.99	0.96	0.95
Merck 4-7 P2	90	97	0.83	0.94	0.99	1	0.99	1	0.83	0.93

Conclusion: While there was no statistical difference between the measurements at pH 5 or 5.5, incorrect answers were obtained on 8–10% of occasions suggesting the need for quality standards for indicators defining minimum acceptable levels of sensitivity and specificity.

Elevering af hovedgærde >45⁰ vs 15-20⁰

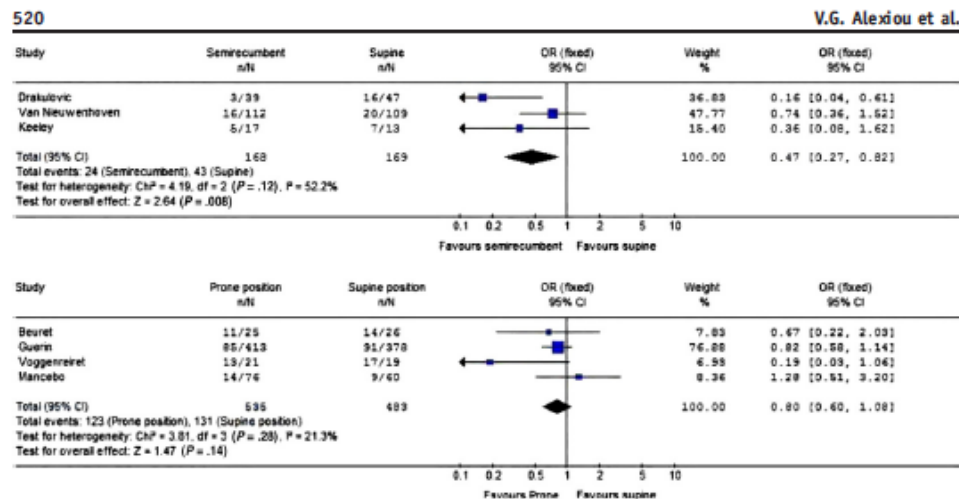


Fig. 2 Odds ratios of the incidence of clinically diagnosed VAP for the individual randomized controlled trials and pooled analyses comparing semirecumbent (treatment) to supine position (control) and prone (treatment) to supine position (control).

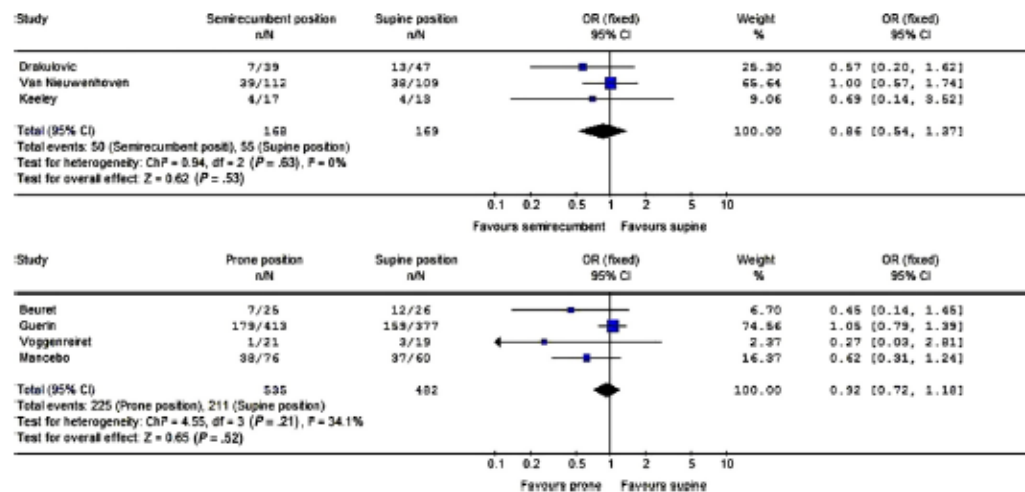


Fig. 3 Odds ratios of death incidence for the individual randomized controlled trials and pooled analyses comparing semirecumbent (treatment) to supine position (control) and prone (treatment) to supine position (control).

Andre kontrolmetoder

Scanning og magnet metoden (Ex Covidien)

Fordele: "Transportabel"; Guide fastmonteret i sonden

Problemer:

- Dyr
- Patienten skal stadig flyttes
- Analyse ved expert (med risiko for fejl)



Får patienterne dækket behovet?

PP194-MON

SHOULD WE IMPROVE PROTEIN INTAKE IN HOSPITALIZED PATIENTS WITH ENTERAL NUTRITION?

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Analyse af læger og sygeplejersker journaler notater om ordineret vs givet EN ved 791 patienter, indlagt på to hospitaler i Sao Paulo 2009-2010

≥20 kcal/kg/day	≥ 1 g P/kg/day
52%	22%

Delivery or documentation?

Kvalitetsindikatorers effekt på EN(ICU)

Table 1 – Quality indicators used

Indicator	Formula	Target
Frequency of energy and protein needs measurement or estimation in NT patients	$\frac{\# \text{ patients with energy/protein expenditure measured} \times 100}{\text{total NT patients} \#}$	>80%
Frequency of inappropriate fasting time patients before NT start (>48h)	$\frac{\# \text{ patients fasting} > 48 \text{h candidate to NT} \times 100}{\text{total} \# \text{ of NT candidate patients}}$	<80%
Frequency of inadvertent enteral tube displacement in ENT patients	$\frac{\# \text{ of inadvertent enteral tube displacements} \times 100}{\text{total} \# \text{ of ENT patients} \times \text{days with enteral tube}}$	<5% in ICUs
Frequency of days with caloric offer given > or <20% of the total prescribed in the total ENT patients days	$\frac{\# \text{ of inappropriate caloric offer days} \times \# \text{ of patients receiving inappropriate caloric offer} \times 100}{\text{total number of days in the evaluated period} \times \# \text{ of NT patients in the evaluated period}}$	<20%
Frequency of days with insufficient protein offer in the total ENT patients days	$\frac{\# \text{ of days with insufficient protein offer} \times \# \text{ of patients receiving insufficient protein offer} \times 100}{\text{total} \# \text{ of days in the evaluated period} \times \# \text{ of patients receiving NT in the evaluated period}}$	<10%
Frequency of diarrhea episodes in ENT patients*	$\frac{\# \text{ of days with diarrhea} \times 100}{\text{total} \# \text{ of ENT days}}$	<10%

NT – nutritional therapy; ENT – enteral nutritional therapy; ICU – intensive care unit.

Source: Clinical Nutrition Taskforce (ILSI Brazil, 2008)¹² Formula adapted.

Konklusion og fremtidige opgaver

- Bedre kontrolprocedure ved sengen og i hjemmet
 - PH kan måles, men er referenceområdet klart defineret, og er test prediktive og sensitive nok?
 - Røntgen?
- Samme kontrol ved anlæggelse som indgift
 - Kan også løse problem med pausetid på ernæring
- Hvornår starter vi EN i praksis i sengeafdelinger/amb?
- Hvilke risikofaktorer udløser EN i sengeafdeling?
- Sondemarkering i medicinmoduler
- **Krav om alene anvendelse af lilla sprøjter og sæt til EN**
- Hovedgærdet 45%. hvor længe? Længere for gamle og morfikabehandlede?

Tak for opmærksomheden

