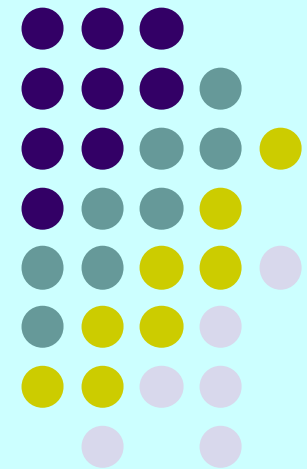
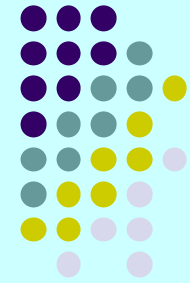


# Key Papers in the Field of Clinical Nutrition View of a Pharmacist

Roland Radziwill  
Department of Pharmacy  
Klinikum Fulda, Germany



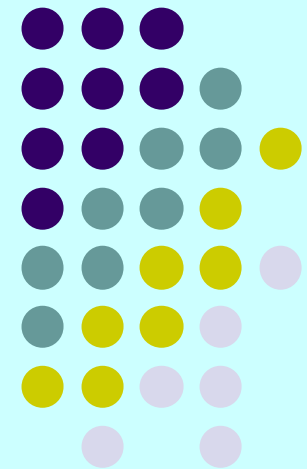


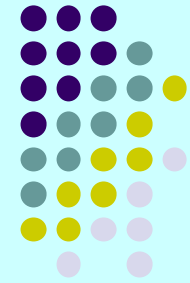
# Criteria for the Search

- European authors
- Original article, no review
- Pharmacist as (co-)author
- Relevant for daily practice in the pharmacy (compounding, stability et.) or for nutrition teams or guidelines
- Written in English

# Physical Characteristics of Total Parenteral Nutrition Bags Significantly Affect the Stability Vitamin C and B<sub>1</sub>: A Controlled Prospective Study

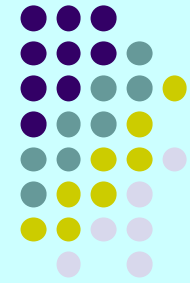
Y.M. Dupertuis, A. Morch, M. Fathi,  
Ch. Sierro, L. Genton, U.G. Kyle,  
C. Pichard. JPEN (2002), **26**: 310-316





# Aim of the Study

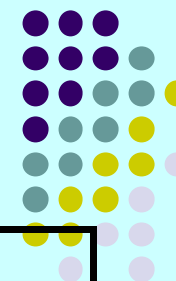
- To assess the stability of the vitamins A, B<sub>1</sub>, C and E
  - at different temperatures (4°C, 21°C, 40°C)
  - At different times (up to 72 hours after compounding)
  - in two different bags (EVA bag, multilayered bag)
- To determine the initial dose of vitamin C necessary to compensate for losses between compounding and the end of the infusion



# Materials and Methods

- Identical TPN in EVA (Nutrimix<sup>®</sup>) or ML (NutriFlex<sup>®</sup>) bags
- Multivitamins (Cernevit<sup>®</sup>), trace elements (Tracutil<sup>®</sup>)
- Stored at different temperatures without daylight protection
- Analytical methods: (RP) HPLC

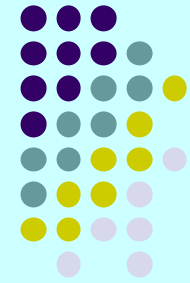
# Results 1: Vitamin C



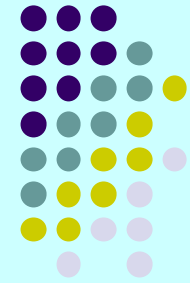
	EVA Bags	ML Bags
Loss at time 0	25-30%	10-25%
Loss by trace elements	Not done	Around 20%
Half Life		
4°C	7.2 h	68.8 h
21°C	3.2 h	24.4 h
40°C	1.1 h	6.8 h
Slower degradation of vitamin C after doubling the dose.		



## Results 2: Vitamins A, E, B<sub>1</sub>



- Vitamin A and E are relatively stable in both bags at any temperature.
- Some instability of vitamin B<sub>1</sub>: 43% loss of thiamine after 72 h at 40°C.
- No influence of trace elements
- A great variation of all the 3 vitamins in the different samples without any apparent cause.

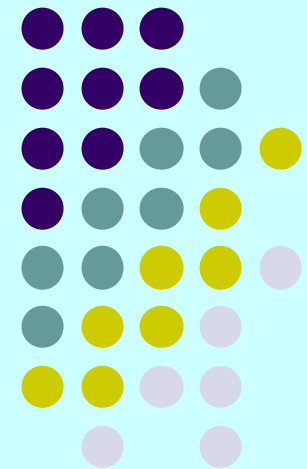


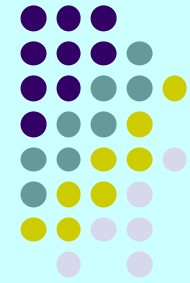
# Conclusion

- Vitamins in TPN compounded in ML bags are more stable than in EVA bags.
- Permeability to oxygen of ML bags is less than in EVA bags. But ML do not prevent vitamin C oxidation at room temperature during 24 hours.
- To counteract the losses vitamin C content was doubled in the TPN admixture.

# Nutritional risk screening (NRS 2002): a new method based on an analysis of controlled clinical trials

J. Kondrup, H. Højgaard Rasmussen, O.  
Hamberg, Z. Stanga and an ad hoc  
ESPEN Working Group  
Clin Nutr (2003), **22**: 321-336

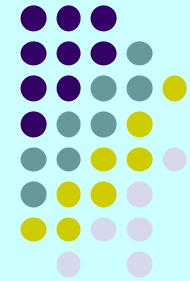




# Aim of the Study

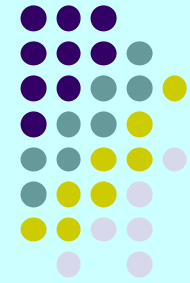
- Validation of a screening system designed to include measures of current/potential undernutrition as well as disease severity.
- Validation against all RCT of nutritional support to evaluate if it was capable to distinguish those with a positive outcome from those with no benefit

# Definition of Positive Outcome



- Accelerated mobilization
- Reduced rate of infection or other complications
- Reduced length of stay
  
- Improvements in surrogate parameters were not counted as positive

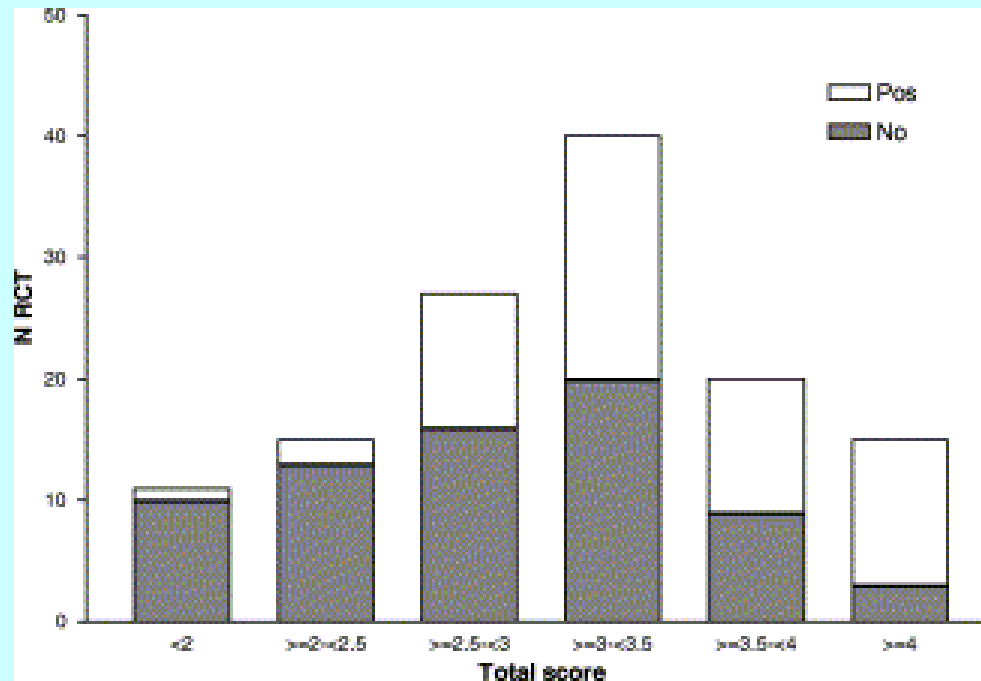
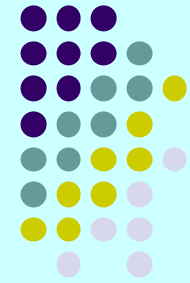
# Severity of disease: Prototype patients



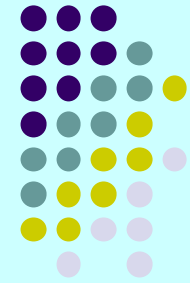
- Score 1: Complications associated with CD. Weak but out of bed regularly. Increased protein requirements can be covered by oral diet or supplements
- Score 2: Confined to bed due to illness (major abdominal surgery, severe infection). Artificial feeding is required in many cases.
- Score 3: ICU patient with assisted ventilation, inotropic drugs, etc. Protein requirement in most cases cannot be covered even by artificial nutrition.

# Variation in nutritional risk score and clinical outcome.

The number of studies with no effect or with a positive effect on clinical outcome are shown.

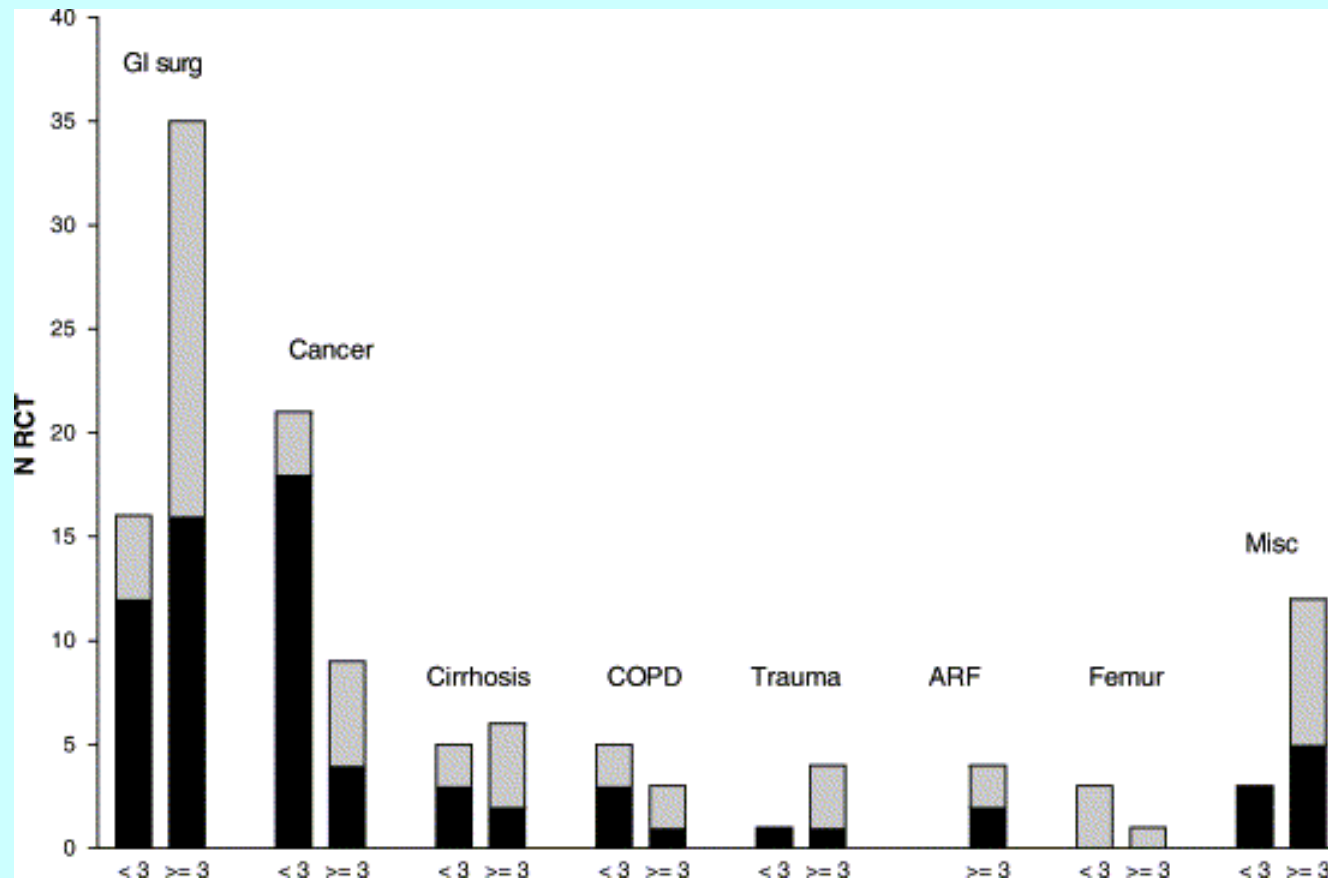
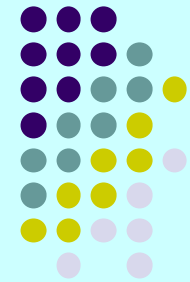


# Likelihood ratios for a positive effect of nutritional intervention at various cut-off points of score for nutritional risk screening (95% CI)

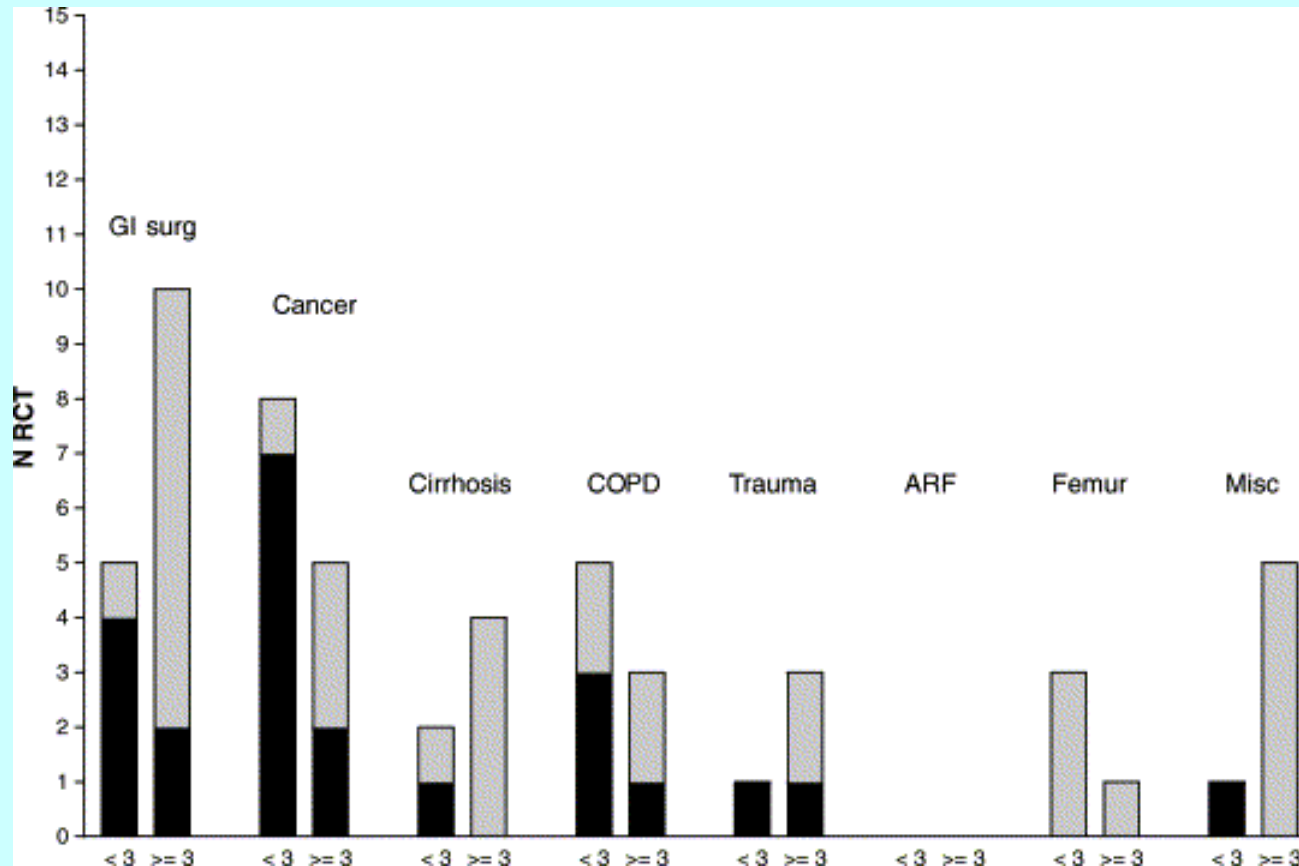
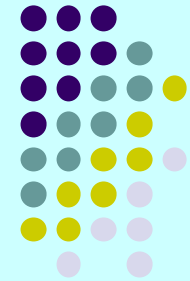


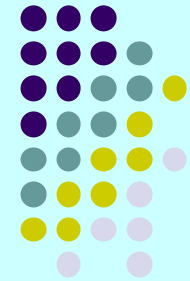
	All (N=128)	Enteral or oral (N=56)	parenteral (N=71)
2.0	1.1 (1.3-1.0)	---	---
2.5	1.4 (1.7-1.2)	1.6 (2.2-1.1)	1.3 (1.6-1.0)
3.0	1.7 (2.3-1.2)	2.9 (5.9-1.4)	1.4 (1.9-1.0)
3.5	2.4 (4.4-1.3)	7.7 (55.3-1.1)	2.1 (4.4-1.1)
4.0	5.0 (16.8-1.5)	All studies were positive	4.2 (15.2-1.1)

# NRS and clinical outcome: Results for various diagnostic groups (black bars no effect)



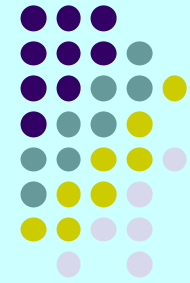
# NRS and clinical outcome. Only studies with enteral or oral feeding are shown.





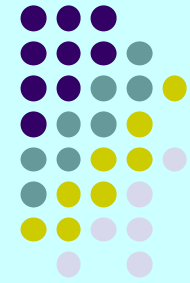
## Further Results

- Severity of disease and severity of undernutrition were almost equally associated with positive outcome.
- PN was less effective, or effective only when the indication was for nutritional support was strong enough.
- A positive outcome was more likely in older patients ( > 70 years).



# Clinical Aspects

- Patients nutritionally at risk had an increased likelihood for a positive effect of nutritional support.
- This easy NRS system may promote doctors and nurses to screen patient more often as today.
- Patients nutritionally not at risk have no benefit from nutritional support especially not from PN.



# Conclusion

- The screening system appears to be able to distinguish between trials with a positive effect vs no effect (validation)
- It can probably also identify patients who are likely to benefit from nutritional support.