NUTRITION SUPPORT TEAMS: THE EVIDENCE

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Nutrition support teams: The evidence

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Long time ago... nutrition has been simple
The first report of intravenous feeding in 1968 signaled a breakthrough in medical care.

Wilmore DE, Dudrick SJ. Growth and development of an infant receiving all nutrients exclusively by vein. JAMA. 1968;203:140-144.
Since then, the use of specialized nutrition support has become a standard tool in the care of patients.
1974 - a survey of hospitals using parenteral nutrition

Practicies among centers often deviated significantly from established standards of care.

As a result of these deviations, it was found that:

• 12% of patients experienced catheter complications
• 42% glucosuria
• 28% electrolyte abnormalities

Personnel taking the responsibility for monitoring HPN patients

Distribution of intervals for monitoring of the stable HPN patient

The persons/location the patient will contact in case of complications

Home Care Agency  
Pharmaceutical company  
GP  
Community Nurse  
Training Hospital  
Local Hospital  
Outpatient clinic  
HPN-team

With the development of specialized nutrition support, an interdisciplinary approach was essential to translating this medical breakthrough from the laboratory to the bedside.
In 1968, a 36-year-old woman with extensive intraperitoneal metastatic ovarian carcinoma became the first patient to be fed entirely by vein at home. She had received maximum hospital benefit and wanted to be discharged to her home about 120 miles north of Philadelphia in order to spend as much of her remaining life as possible with her husband and 4 young children. The logistics of maintaining her with TPN at home at this early stage in the development of the TPN technique were challenging, but with the help of the pharmacists at the Hospital of the University of Pennsylvania and some of our alumni physicians and surgeons in the patient’s home town, we were able to help fulfill the patient’s wishes to be home with her family, fed entirely by TPN successfully and safely for the final 6 months of her life.
It became obvious early that we had to assemble a formal team to support TPN patient activities. In 1962, we already had an interested group of surgeons, pharmacists, and basic scientists working together informally on various aspects of this project. However, I felt strongly that we needed a designated nurse on the team to ensure continuity, standardization of, and strict adherence to safe principles and practices, and quality assurance, in addition to helping the hospital nursing staff with the actual care and monitoring of the patients. The existing role model in the hospital was a chemotherapy nurse who had pioneered the nurse practitioner concept at our hospital. A key decision was to recruit the best emergency department nurse, to join what we called the “Hyperalimentation Team.” Subsequently, the name evolved to the TPN Team, the Nutrition Support Team, the PN Team, the Home Parenteral Nutrition (HPN) Team, etc.
Genesis of the TPN Team - II

As the complexity and interest in the field of nutrition support grew, we added a dietitian, psychologist, social worker, financial advisor, insurance specialist; and later, clinical pathologists, basic science nutritionists, gastroenterologists, nephrologists, psychiatrists, oncologists, pediatricians, and infectious disease and other medical specialists. This multidisciplinary approach to the nutrition support of patients formed the grass roots that led eventually to the concept and formation of the American Society of Parenteral and Enteral Nutrition (A.S.P.E.N.), ESPEN, POLSPEN, and hundreds of similar societies worldwide, to promote interdisciplinary research, communication, and collaboration.
The first hospital nutrition support team was established in the Boston City Hospital, in 1973.
After introduction of NST
Complications:
- 1% sepsis
- 5% glucosuria
- 2.7% electrolyte abnormalities

The dramatic reduction in complications prompted to recommendation of protocols and a team approach for administering PN.

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Nutritional support – who needs it and who does it?

Such a team improves the quality of treatment and reduces costs by avoiding unnecessary treatments and simplifying the treatments used; reducing complications; monitoring use of nutrients and outcome of treatment; reducing waste; and standardizing nutrients and equipment to enable bulk purchase and negotiation of competitive rates”

King’s Fund Working Party 1992 A positive approach to nutrition as treatment. King’s Fund Centre, London
An European survey of structure and organisation of nutrition support teams in Germany, Austria and Switzerland

E. Shang a,⁎, T. Hasenberg a, B. Schlegel b, A.B. Sterchi c, K. Schindler d, W. Druml d, B. Koletzko e, R. Meier f
Figure 2 Distribution of the 87 evaluated NST among the different hospital types, D = Germany, A = Austria, CH = Switzerland.
Europe: nutritional support teams

- Lithuania: 10%
- Poland: 72.4%
- Turkey: 68.4%
- Greece: 0%
- Croatia: 8.9%
- Estonia: 0%

S. Klek et al. JPEN 2014
Composition of a nutritional support team:
The structure and function of NSTs vary from one institution to another depending on the local needs, organizational culture, and available personnel.

The core members of a NST:

Physician
Dietitian
Nurse
Pharmacist

Next to the ‘core team’:

- finance manager, general manager
- nurse staff member
- supplies member
- catering officer
- clinical therapist
- pathology representative
- senior doctor

.... may all be involved either on a permanent or on an *ad hoc basis*

Goals of NST
Goals of a NST

- preventing and treating hospital malnutrition
- reducing or avoiding metabolic complications
- reducing complications related to nutrition
- reducing mechanical complications
- developing clinical nutrition guidelines
- monitoring and evaluation of nutrition therapy
- collecting data on the effectiveness (and side effects) of artificial nutrition
- being a centre of knowledge
- sharing knowledge with others
EVIDENCE?
With NSTs patients’ energy requirements were more likely to be met and mechanical as well as metabolic complications of nutritional therapy were reduced.

An interdisciplinary team approach has been shown to enhance quality of care, improve patient safety and outcomes, and reduce healthcare costs.
QUALITY INDICATORS - TOP 10

1. Priority use of enteral route in the absence of contra indications
2. Patients with malnutrition (risk) receive a nutrition care plan or nutritional support
3. The hospital has a formulary on enteral formulas, parenteral nutrition solutions and nutritional supplements

4. The hospital has a designated nutrition support service (or team)

5. The hospital has written policies and procedures for the provision of nutrition support therapy
6. In hospitalized patients on PN the plasma triglycerides are checked weekly
7. Presence of a protocol for enteral drug administration through a feeding tube
8. Frequency of periodic reassessment of patients on NS
9. Enteral and PN orders are regularly revised and adjusted
10. There is a hospital wide consensus on the screening method(s) for malnutrition.

The economic benefits of setting up an NST have been extensively documented.


An interdisciplinary team provides nutrition care more effectively than individuals acting independently.

COOPERATION WITH PHARMACY
A standardized order form reduce the percentage of patients who receive therapy that deviates from prescribed treatment.
CHEMOTHERAPY AND RADIATION THERAPY
The nutritional status in the NST group were much better than those in the control group: prealbumin, transferrin, and albumin ($P = 0.001, 0.000,$ and $0.000$, respectively).

The complication rate:

- bone marrow suppression (20% vs. 48%, $P = 0.037$)
- infections (12% vs. 44%, $P = 0.012$)

was lower NST group.

Only one patient in the NST group did not complete the planned radiotherapy while 6 patients in the control group had interrupted or delayed radiotherapy (96% vs. 76%, $P = 0.103$).

LOS was decreased by 4.5 days ($P = 0.001$) and in-patient cost was reduced ($P > 0.05$) in the NST group.

The impact of a nutrition support team on patient care outcomes in a pediatric ICU

Nutrition support team “motivated” an increase in the use of enteral nutrition and decrease in PN usage that translated into reduced mortality in the ICU.

The risk of death - 83% lower in EN pts

Gurgueira GL, Leite HP, Taddei JA. Outcomes in a pediatric intensive care unit before and after the implementation of a nutrition support team. JPEN J Parenter Enteral Nutr. 2005;29: 176-185.
Introduction of a phosphate-free premixed renal replacement fluid without system-wide education.

Intervention of NST – implementation of protocol adjusted to new dialysate composition – caused reduction of hypophosphataemia in ICU CRRT pts.

Postimplementation pts were also less likely to develop hypophosphatemia compared with preimplementation patients.

Home artificial nutrition
A specialized home enteral tube feeding program significantly reduced the number of hospital admissions and the duration of hospital and ICU stays.
Uniform multidisciplinary approach decrease:

• the duration of parenteral nutrition
• catheter related infection rates

and ensue:

• high transplant-free survival
• avoidance of liver failure (the frequency of transient neonatal cholestasis remains unchanged)

Even very good idea needs continuous improvement!!!
Need for evaluation and continuous training

It is important to establish periodic meetings among different health professionals who prescribe and deliver PNT to define responsibilities and protocols.

Nutrition Support Clinical Guidelines

Development of an evidence-based clinical guideline is a way to ensure that a nutrition support team is using safe delivery of enteral nutrition and PN and assisting in identifying problems that need to be addressed.
Management of acute intestinal failure: A position paper from the European Society for Clinical Nutrition and Metabolism (ESPEN) Special Interest Group

Stanislaw Klek, Alastair Forbes, Simon Gabe, Mette Holst, Geert Wanten, Øyvind Irtun, Steven Olde Damink, Marina Panisić-Seljč, Rosa Burgos Pelaez, Loris Pironi, Annika Reintam Blaser, Henrik Højgaard Rasmussen, Stéphane M. Schneider, Ronan Thibault, Ruben G.J. Visschers, Jonathan Shaffer

Clinical Nutrition Guidelines

Australasian society for parenteral and enteral nutrition (AuSPEN) adult vitamin guidelines for parenteral nutrition

Emma J Osland AdvAPD MPH1, Azmat Ali AdvAPD, Truc Nguyen MPH1, Melvyn Davis PhC FSHP, Lyn Gillanders NZRD
If you have a problem...
DON'T PANIC,

ORGANISE!
2 + 2 = >5
ESPEN CONGRESS 2019 - KRAKÓW
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