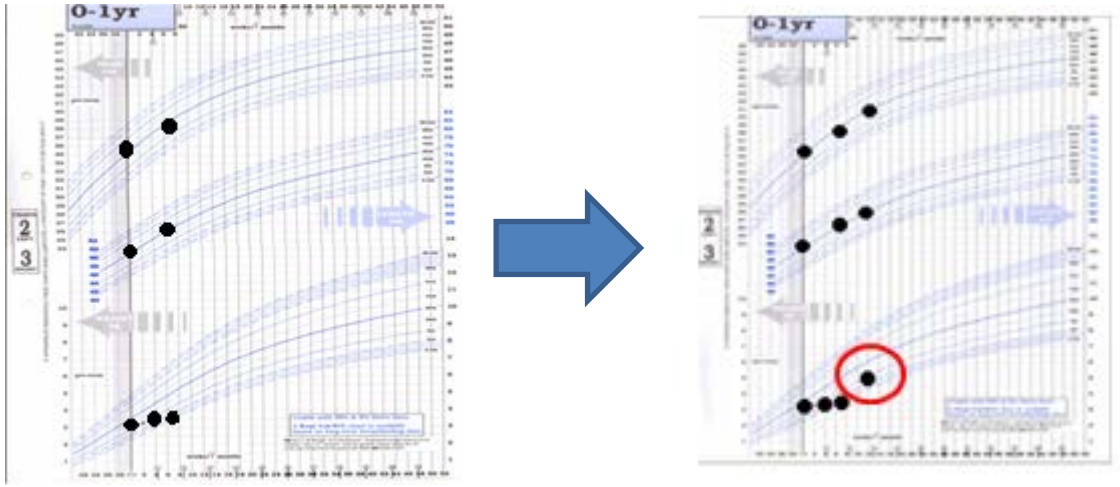
ROLE OF PAEDIATRIC NUTRITION TEAMS

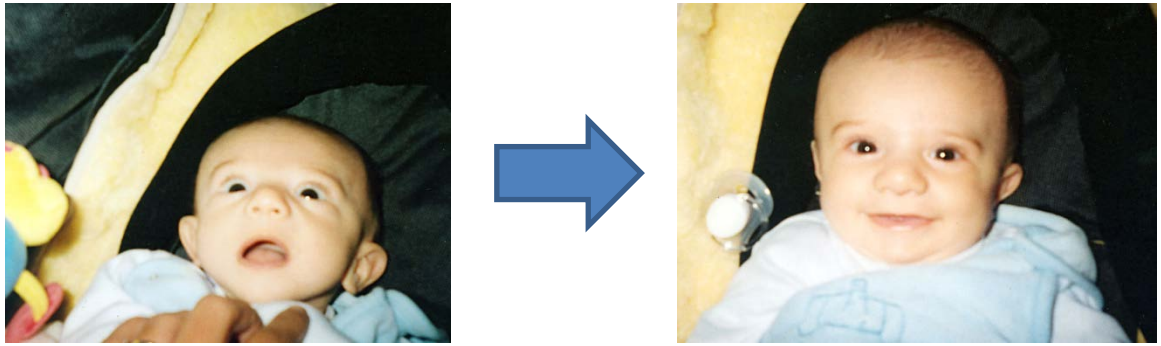
Chris Smith

Senior Paediatric Dietitian

Royal Alexandra Children's Hospital

Z Score	Day 1, mean ± SD	Day 28, mean ± SD	Paired t test
Weight for Length	-1.6029±1.4411	-0.8759±1.4317	P=0.051
Weight for Age	-2.8844±1.5589	-2.4694±1.5244	P=0.029
BMI for Age	-2.026±1.342	-1.2935±1.386	P=0.064



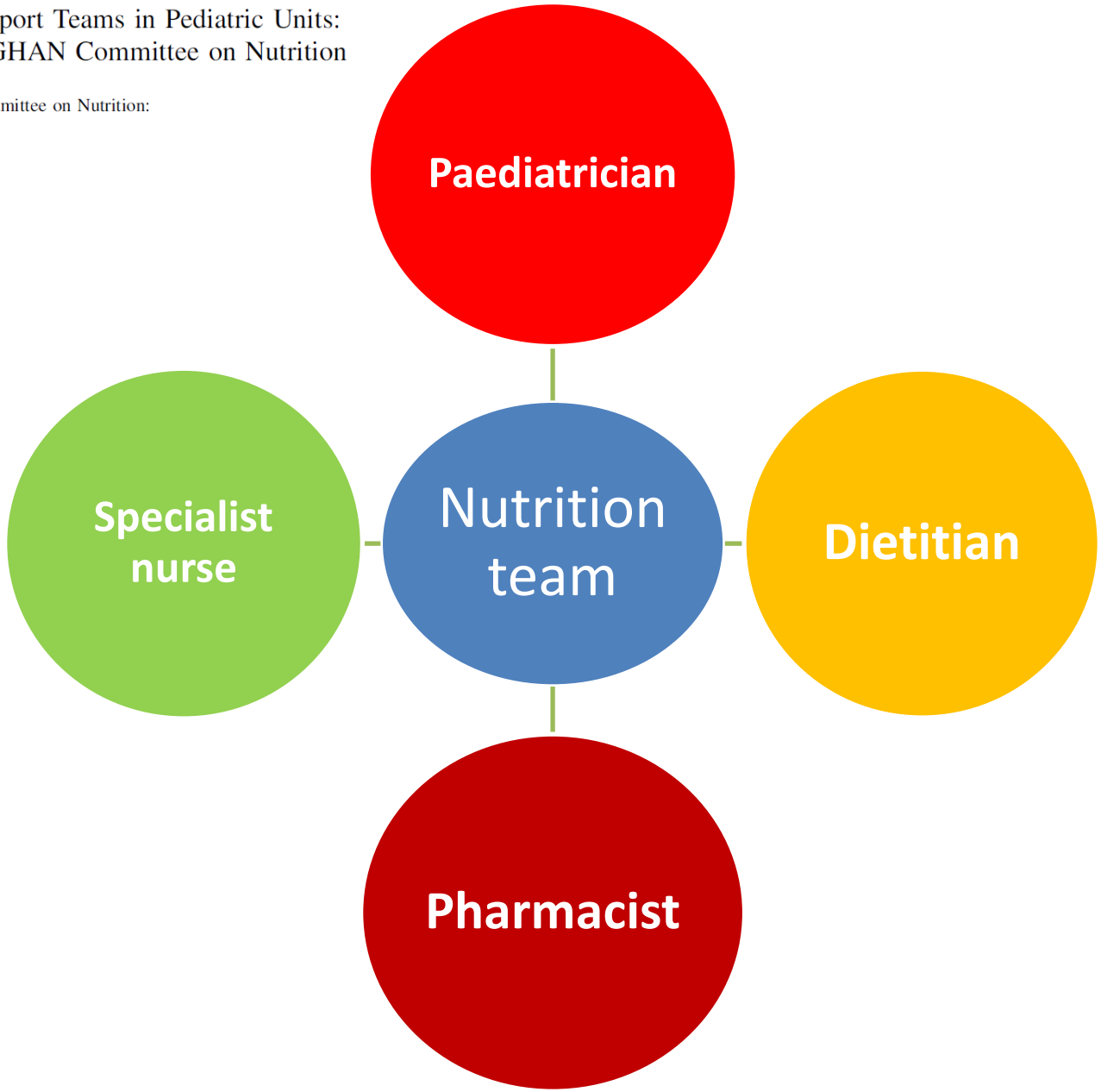



Poo
HOSPITAL
SICK

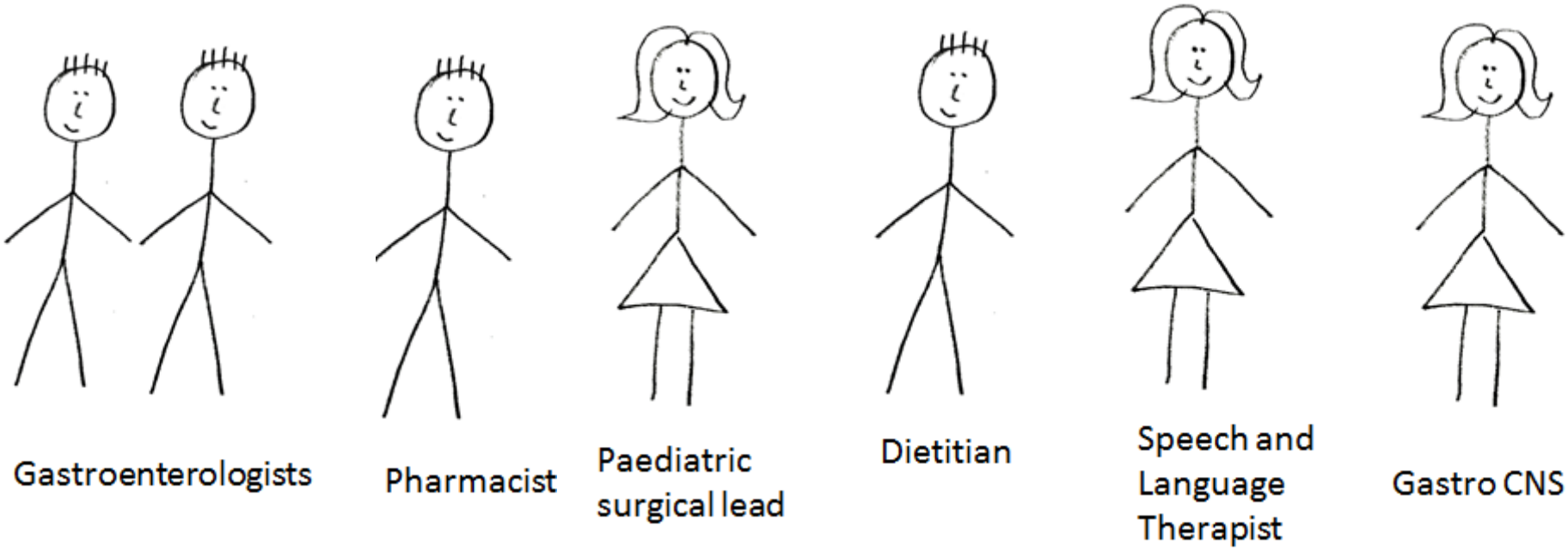
The Need for Nutrition Support Teams in Pediatric Units: A Commentary by the ESPGHAN Committee on Nutrition

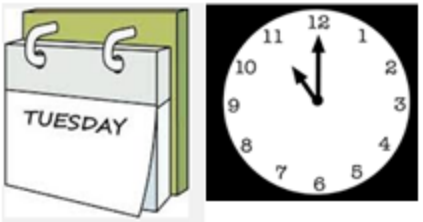
ESPGHAN Committee on Nutrition:

Journal of Pediatric Gastroenterology and Nutrition
41:8–11 © July 2005 Lippincott Williams & Wilkins, Philadelphia



The role of paediatric nutrition teams

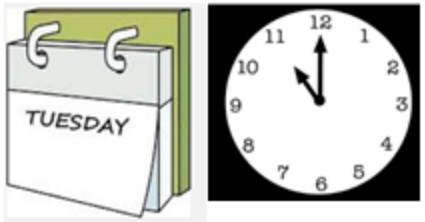

Gastroenterologists
Pharmacist
Paediatric surgical lead
Dietitian
Speech and Language Therapist
Gastro CNS


TUESDAY
12
1
2
3
4
5
6
7
8
9
10
11

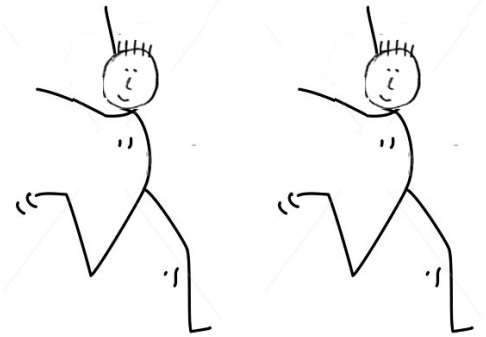
Paediatric surgical lead

Speech and Language Therapist

Dietitian

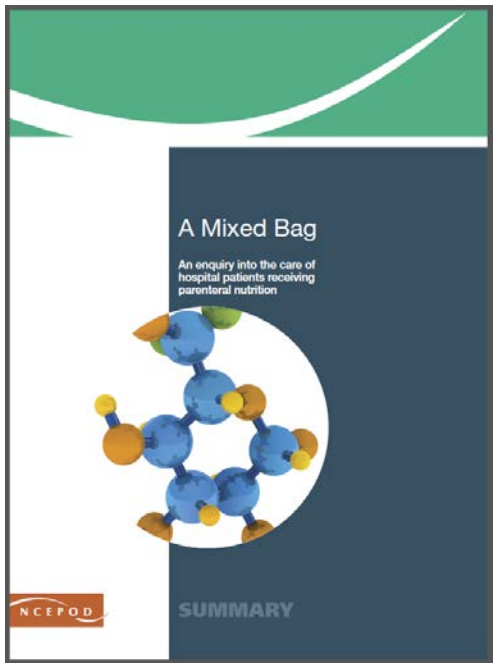


Gastro CNS



Gastroenterologists

Pharmacist



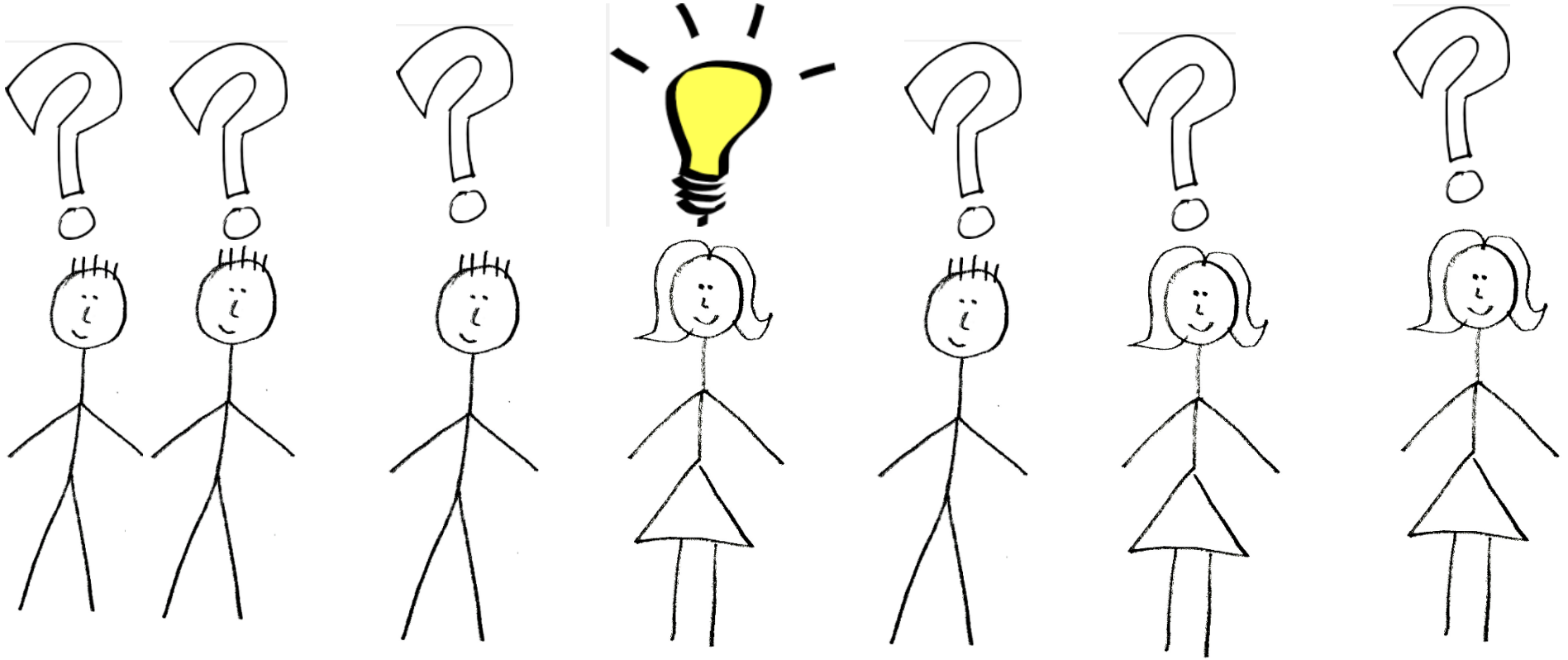
Organisational Data

Key Findings

- Despite a high proportion of the patients in the study being surgical there was a very low involvement of surgeons in nutrition teams.

Recommendations

- Surgical teams are high volume users of PN. As such they need to engage more in clinical nutrition issues and increase their profile within nutrition teams. (Medical Directors and Clinical Directors)



Gastroenterologists

Dietitian

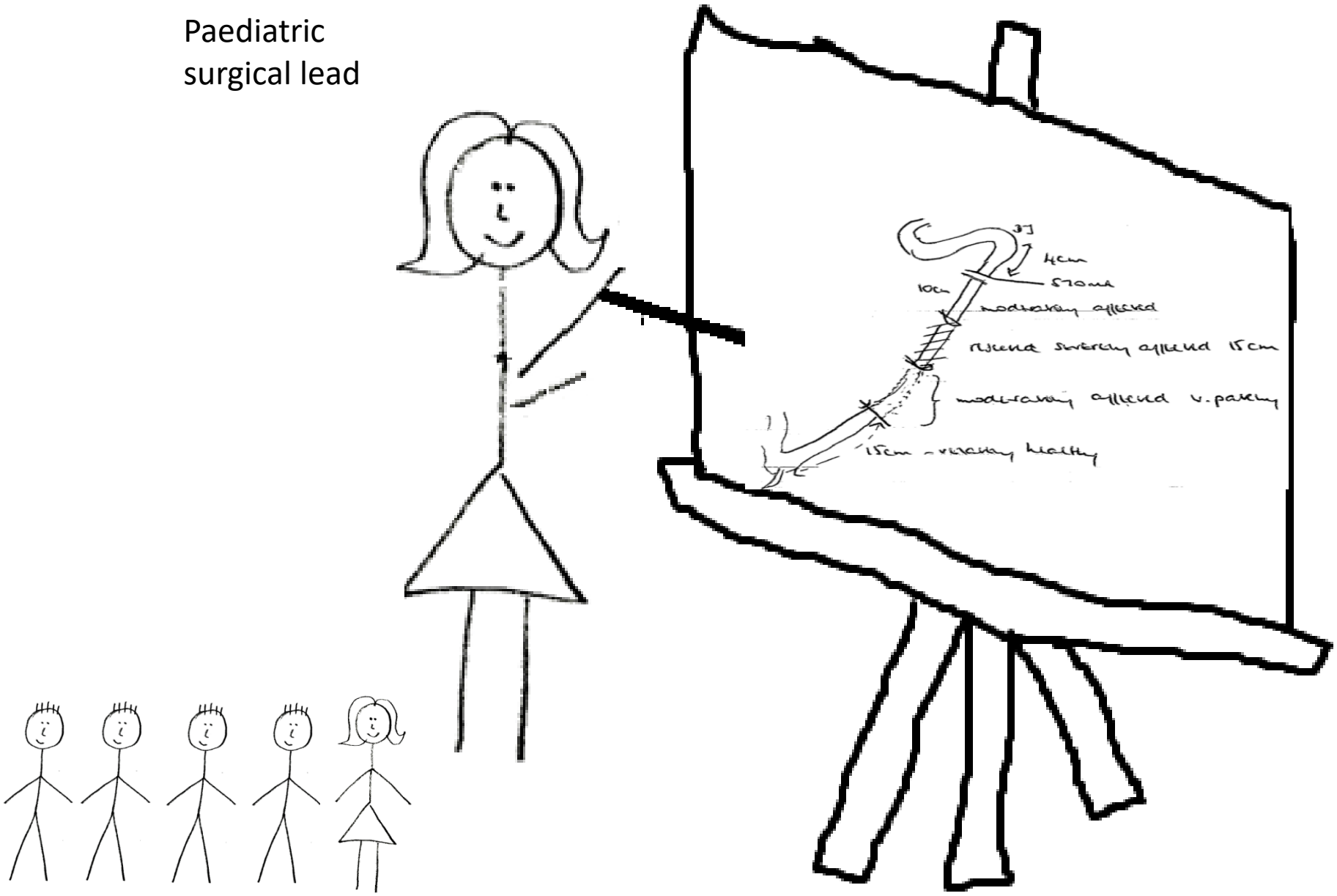
Paediatric surgical lead

Pharmacist

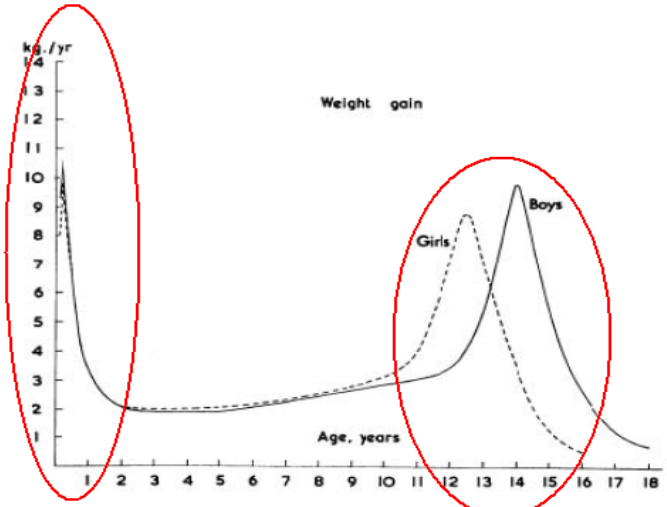
Speech and Language Therapist

Gastro CNS

Paediatric
surgical lead

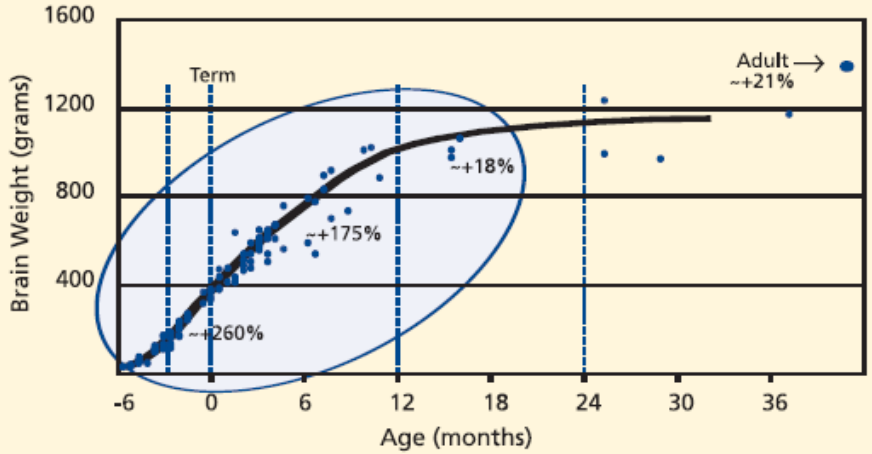


Velocity curves for weight in boys or girls. These curves represent the weight growth velocity and how this changes with age, but are not intended to depict normative data

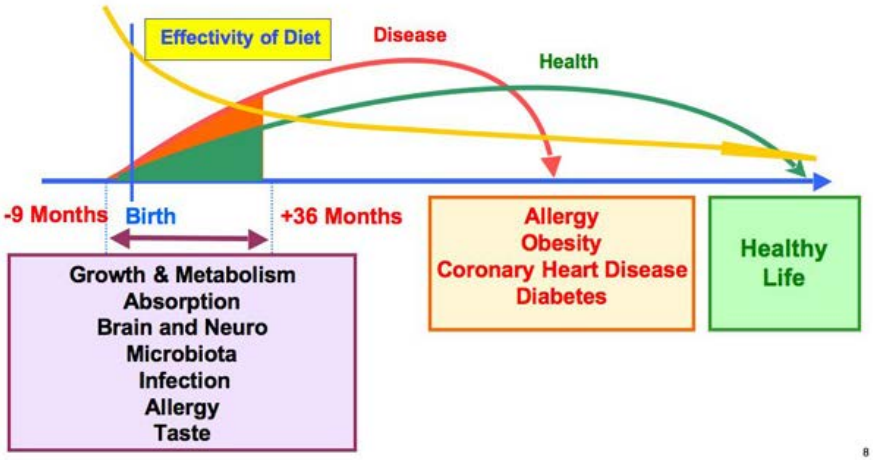


Arch Dis Child, Tanner JM, Whitehouse RH & Takaishi M, vol 41, pages 454-471, 1966

Figure 1 Brain Growth Especially Rapid in the Last Trimester and First 2 Years of Life[7]

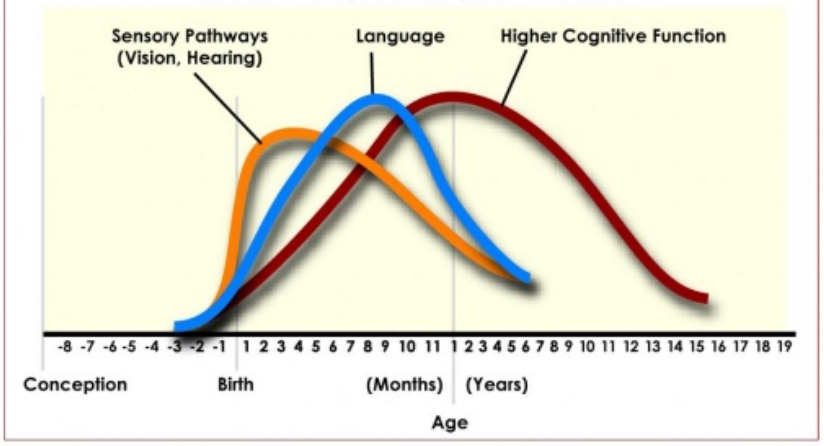


Human Milk: Programming for Later Life



Human Brain Development

Experience-Dependent Synapse Formation



Nelson, C.A., in From Neurons to Neighborhoods (2000). Shonkoff, J. & Phillips, D. (Eds.)

Accessed from: Center on the Developing Child at Harvard University (2007). A Science-Based Framework for Early Childhood Policy: Using Evidence to Improve Outcomes in Learning, Behavior, and Health for Vulnerable Children http://www.developingchild.harvard.edu

The role of paediatric nutrition teams

Children's Services
BRIGHTON AND SUSSEX UNIVERSITY HOSPITALS NHS TRUST

15/122 (12%) of hospitals had a nutritional support team that was involved in providing PN support for neonates

Great North

Nutrition Team	✓
4 key members	✓
Patients	PN > 2WEEKS
Routine Neonates	✗
MDT WR	✓

Edinburgh

Nutrition Team	✓
4 key members	✓
Patients	PN, complex EF
Routine Neonates	✗
MDT WR	✓

Birmingham

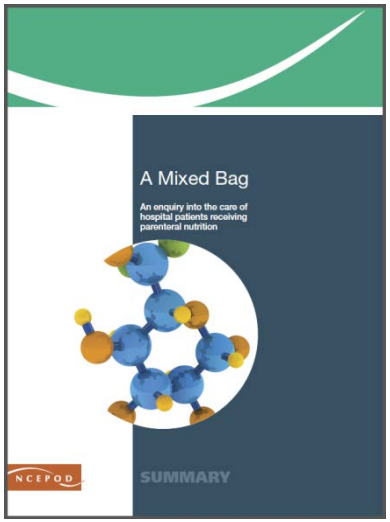
Nutrition Team	✓
4 key members	✓
Patients	PN
Routine Neonates	✓
MDT ward round	✓

Brighton

Nutrition Team	✓
4 key members	✓
Patients	PN
Routine Neonates	✓
MDT ward round	✓

Southampton

Nutrition Team	✓
4 key members	✓
Patients	PN
Routine Neonates	✓
MDT ward round	✓



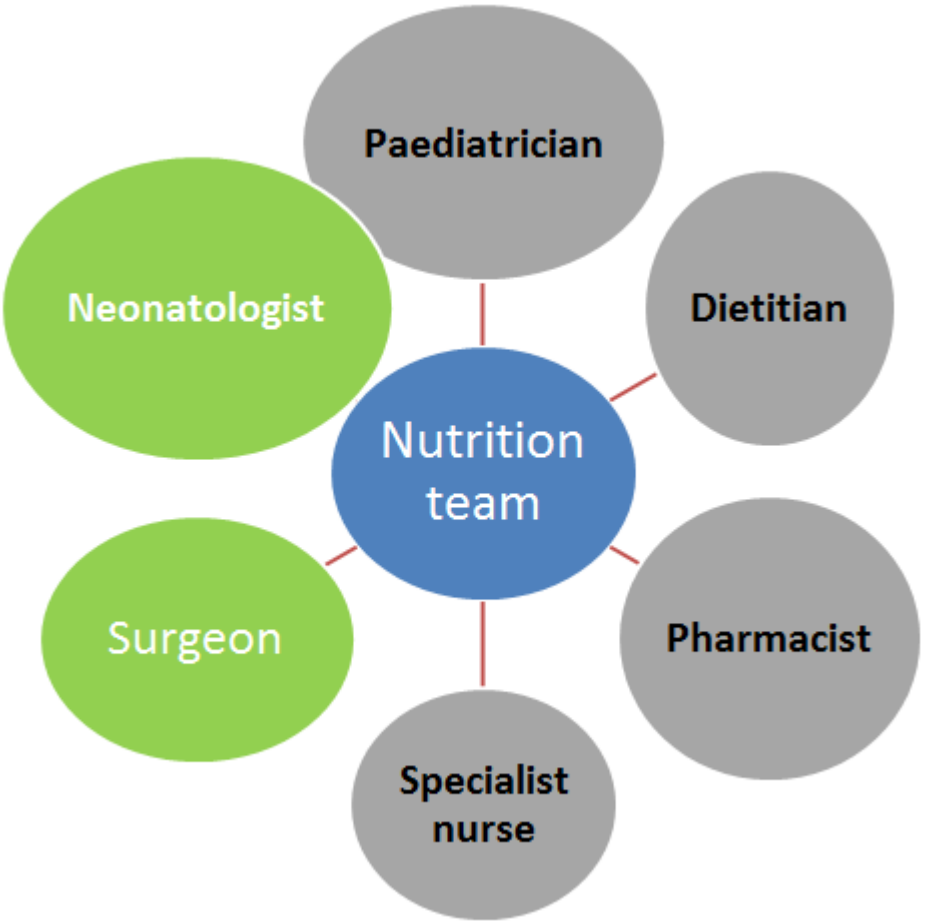


Table 5.23 Composition of nutrition teams

Team staff	Number of Hospitals
Doctor/Dietitian	1
Doctor/Dietitian/Pharmacist	8
Doctor/Dietitian/Pharmacist/ Nutrition Nurse Specialist	3
Doctor/Pharmacist	2
Not answered	1
Total	**15**

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MAIN ROLES OF THE NUTRITION SUPPORT TEAM

- To educate hospital staff with respect to identification and management of nutritional problems
- To implement patient screening for nutritional risk
- To identify patients who require nutritional support
- To ensure provision of effective nutritional management for patients
- To plan home nutrition after discharge
- To monitor and evaluate practice

→ EDUCATION

→ IDENTIFICATION

→ PROVISION

→ IMPROVE OUTCOME

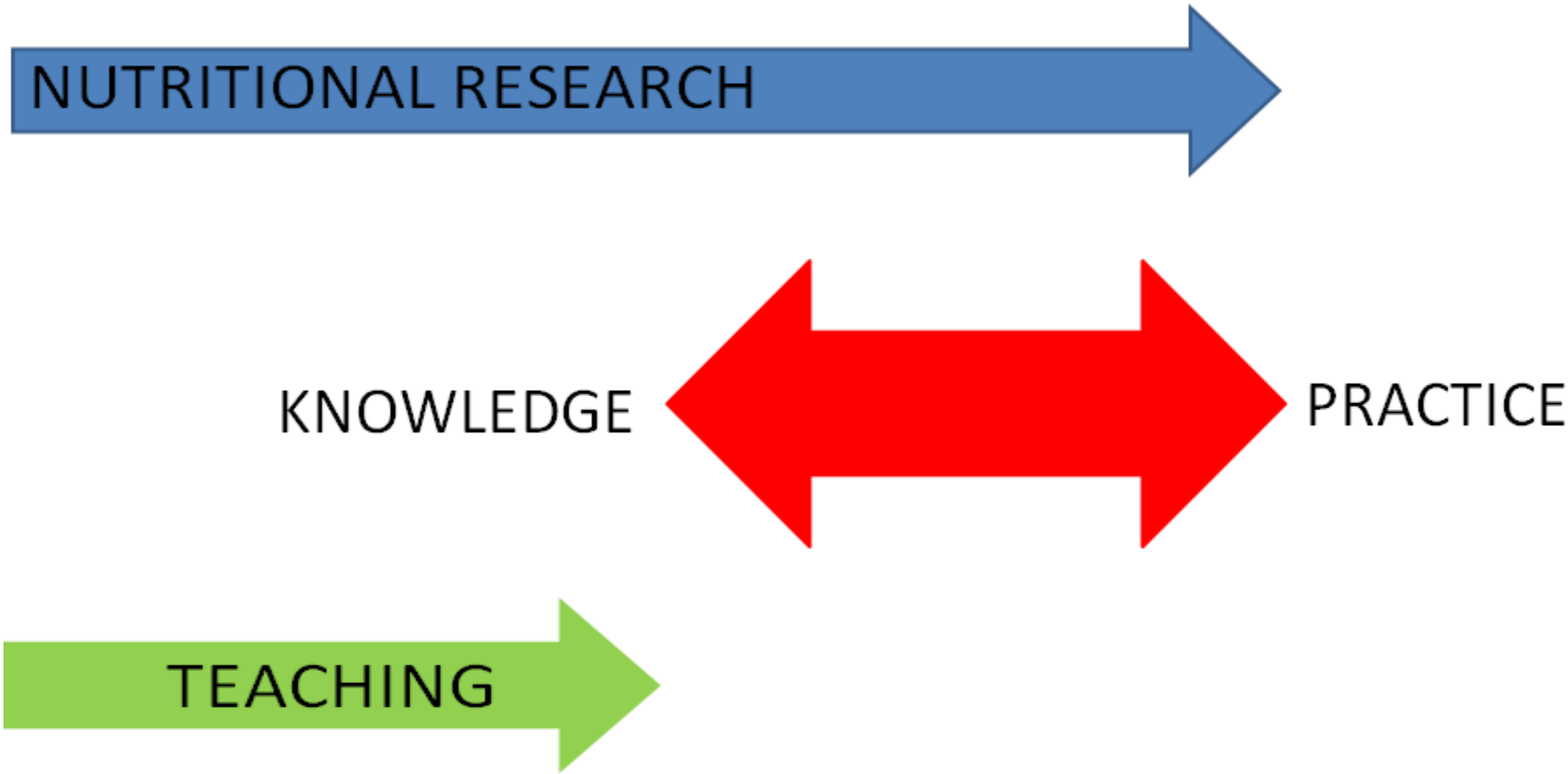
SPECIAL REPORT

Practices in relation to nutritional care and support—report from the Council of Europe

Clinical Nutrition (2002) **21(4)**: 351–354

COUNCIL OF EUROPE

CONSEIL DE L'EUROPE



EDUCATION

A Training Program for Anthropometric Measurements by a Dedicated Nutrition Support Team Improves Nutritional Status Assessment of the Critically Ill Child*

Frederic V. Valla, MD[1]; Carole Ford-Chessel, BS[2]; Rosan Meyer, PhD[3]; Julien Berthiller, MSc[4,5,6]; Christine Dupenloup, BSN[1]; Nathalie Follin-Arbelet, BSN[1]; Anna Hubert, MD[1]; Etienne Javouhey, MD, PhD[1]; Noel Peretti, MD, PhD[7]

Pediatr Crit Care Med 2015; 16:e82–e88

	Preintervention Feb 2011	Early Postintervention Feb 2012		Late Postintervention Feb 2013	
Nutritional Status Assessment	**Cohort 1 ($n = 41$)**	**Cohort 2 ($n = 55$)**	**p^a**	**Cohort 3 ($n = 91$)**	**p^b**
Weight, *n* (%)	38 (95)	51 (93)	0.99	91 (100)	0.9
Height, *n* (%)	13 (32)	36 (65)	0.002	90 (99)	< 0.001
HC, MUAC, *n* (%)	9 (26)	24 (60)	0.004	87 (96)	< 0.001
Weight for height, *n* (%)	15 (38)	41 (75)	< 0.001	90 (99)	< 0.001
Height for age, *n* (%)	8 (20)	41 (75)	< 0.001	90 (99)	< 0.001
Body mass index, *n* (%)	16 (40)	41 (75)	< 0.001	90 (99)	< 0.001
MUAC/HC, *n* (%)	9 (26)	24 (60)	0.004	87 (96)	< 0.001
Nutritional status assessment medical conclusion, *n* (%)	6 (15)	33 (60)	< 0.001	77 (70)	< 0.001

Staff training: a key factor in reducing intravascular catheter sepsis.

J W Puntis, C E Holden, S Smallman, Y Finkel, R H George, I W Booth

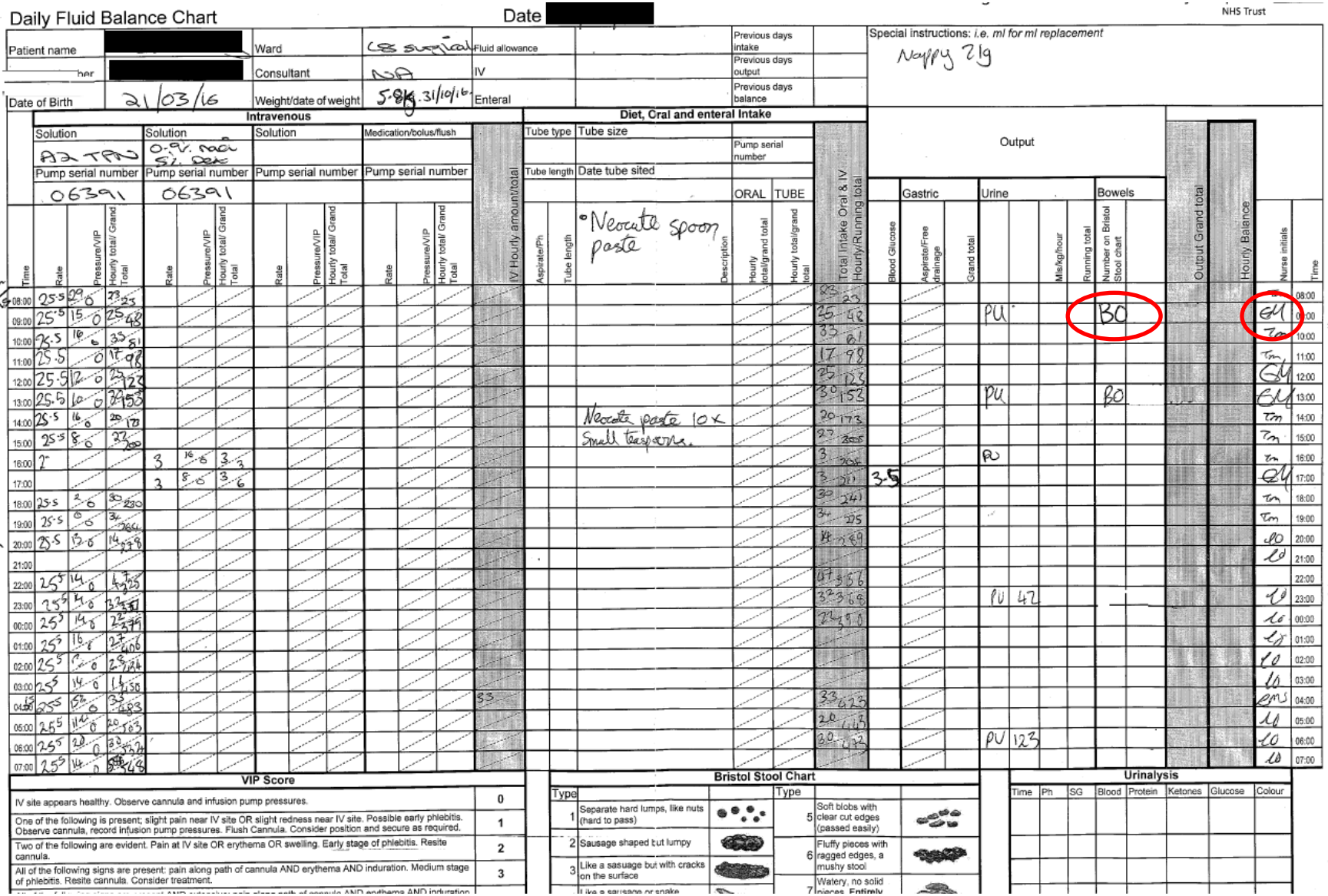
Arch Dis Child 1991;66:335-337 doi:10.1136/adc.66.3.335

Arch Dis Child. 2016 Sep;101(9):e2. doi: 10.1136/archdischild-2016-311535.25.

PN FOR CHILDREN - INFORMATION LEAFLET.

Riddell R[1], Lewis A[1], Tuthill D[1].

EDUCATION



Daily Fluid Balance Chart

Date [redacted]

NHS Trust

Patient name [redacted] Ward C&S surgical Fluid allowance Previous days intake

Consultant N/A IV Previous days output

Date of Birth 21/03/16 Weight/date of weight 5.8kg 31/10/16 Enteral Previous days balance

Special instructions: *i.e. ml for ml replacement*

Nappy 2g

Intravenous

Solution: A2 TPN | Solution: 0.9% NaCl 5% Dex | Solution | Medication/bolus/flush

Pump serial number: 06391 | 06391 | | |

Diet, Oral and enteral Intake

Tube type | Tube size | Pump serial number

Tube length | Date tube sited

ORAL | TUBE

Description: Neocate spoon paste

Neocate paste 10x small teaspoons.

Output

Gastric | Urine | Bowels

Time	Rate	Pressure/VIP	Hourly total/ Grand Total	Rate	Pressure/VIP	Hourly total/ Grand Total	Rate	Pressure/VIP	Hourly total/ Grand Total	Rate	Pressure/VIP	Hourly total/ Grand Total	IV Hourly amount/total	Aspirate/Ph	Tube length	Description	Hourly total/grand total	Hourly total/grand total	Total Intake Oral & IV Hourly/Running total	Blood Glucose	Aspirate/Free drainage	Gastric Grand total	Urine	Ml/kg/hour	Urine Running total	Bowels Number on Bristol Stool chart	Output Grand total	Hourly Balance	Nurse initials	Time
08:00	25.5	29 0	73 23															83 23				PU			BO			GM	08:00
09:00	25.5	15 0	25 48															25 48											09:00
10:00	25.5	10 0	35 81															33 81										Tm	10:00
11:00	25.5	0	17 98															17 98										Tm	11:00
12:00	25.5	12 0	37 123															25 123										GM	12:00
13:00	25.5	10 0	27 153															30 153				PU			BO			GM	13:00
14:00	25.5	16 0	20 173															20 173										Tm	14:00
15:00	25.5	8 0	32 205															32 205										Tm	15:00
16:00	2			3	16 0	3 3												3 208				PU						Tm	16:00
17:00				3	8 0	3 6												3 211		3.5								GM	17:00
18:00	25.5	2 0	30 230															30 241										Tm	18:00
19:00	25.5	0	34 264															34 275										Tm	19:00
20:00	25.5	12 0	14 278															14 289										dO	20:00
21:00																												lO	21:00
22:00	25	14 0	47 325															07 356											22:00
23:00	25	14 0	32 357															32 388				PU	42					lO	23:00
00:00	25	14 0	22 379															22 410										lO	00:00
01:00	25	16 0	27 406																									lO	01:00
02:00	25	0	28 434																									lO	02:00
03:00	25	14 0	14 448																									lO	03:00
04:00	25	8 0	33 483										33					33 423										ems	04:00
05:00	25	14 0	20 503															20 443										lO	05:00
06:00	25	20	20 523															30 473				PU	123					lO	06:00
07:00	25	14 0	25 548																									lO	07:00

VIP Score

IV site appears healthy. Observe cannula and infusion pump pressures.	0
One of the following is present; slight pain near IV site OR slight redness near IV site. Possible early phlebitis. Observe cannula, record infusion pump pressures. Flush Cannula. Consider position and secure as required.	1
Two of the following are evident. Pain at IV site OR erythema OR swelling. Early stage of phlebitis. Resite cannula.	2
All of the following signs are present: pain along path of cannula AND erythema AND induration. Medium stage of phlebitis. Resite cannula. Consider treatment.	3

Bristol Stool Chart

Type		Type	
1	Separate hard lumps, like nuts (hard to pass)	5	Soft blobs with clear cut edges (passed easily)
2	Sausage shaped but lumpy	6	Fluffy pieces with ragged edges, a mushy stool
3	Like a sausage but with cracks on the surface	7	Watery, no solid pieces. Entirely

Urinalysis

Time	Ph	SG	Blood	Protein	Ketones	Glucose	Colour

The role of paediatric nutrition teams

Children's Services

BRIGHTON AND SUSSEX UNIVERSITY HOSPITALS NHS TRUST

EDUCATION

Brighton and Sussex University Hospitals NHS Trust

Daily Fluid Balance Chart

Date [redacted]

Patient name	[redacted]	Ward	L5 Surg	Fluid allowance	
Trust ID Number	[redacted]	Consultant	NA	IV	
Date of Birth	21/03/16	Weight/date of weight	5.81kg (31/10)	Enteral	

Previous days intake: — Previous days output: — Previous days balance: —

Special instructions: *i.e. ml for ml replacement* — nappies 2hr

Intravenous — Solution: 14.2 TPN, Pump serial number 06391; Solution: 0.9% NaCl 5% Dex, Pump serial number 06391; Solution: —; Medication/bolus/flush: —

Diet, Oral and enteral Intake — Tube type; Tube size; Pump serial number; Tube length; Date tube sited — Head Circ Today = 41.

Output — Gastric, Urine, Bowels

Time	Sol. 1 Rate	Sol. 1 Pressure/VIP	Sol. 1 Hourly total/Grand Total	Sol. 2 Rate	Sol. 2 Pressure/VIP	Sol. 2 Hourly total/Grand Total	IV Hourly amount/total	Oral/Tube Description	Total Intake Oral & IV Hourly/Running total	Blood Glucose	Gastric Aspirate/Free drainage	Urine	Mls/kg/hour	Urine Running total	Bowels Number on Bristol Stool chart	Bowels	Output Grand total	Nurse initials
08:00	25.5	0 / 18	43 / 43	0			43 / 43		43			40		40		~~40~~	40	[illegible]
09:00	25.5	0 / 27	24 / 67				24 / 67		67									
10:00	25.5	0 / 12	29 / 96				29 / 96		96						BNO			EM
11:00	25.5	0 / 21	25 / 121				25 / 121		121			41		81	BNO		81	EM
12:00	25.5	0 / 19	8 / 129				8 / 129	Neocate paste 6 small spoons	129						BNO			EM
13:00	25.5	0 / 16	32 / 161				32 / 161		161						BNO			EM
14:00	25.5	0 / 11	29 / 181				20 / 181		181						BNO			EM
15:00	25.5	0 / 13	35 / 216				35 / 216		216									[illegible]
16:00	25.5	0 / 0	16 / 232	3	0 / 0	0 / 0	16 / 232		232									[illegible]
17:00	↓			3	0 / 0	3 / 3	3 / 235		235			52		133				[illegible]
18:00	25.50	0 / 0	232	3	0 / 0	2 / 3	2 / 235	Neocate Paste		2.6								[illegible]
19:00	25.5	0 / 11	10 / 242				10 / 245	6 tsp – Small Spoons	10 / 265						BO	30	111	[illegible]
20:00																		[illegible]
21:00	25.5	9 / 0	69 / 311				69 / 314		69 / 314						BNO			EM
22:00	25.5	19 / 0	25 / 336				25 / 339		25 / 339		1 x large vomit.	22		155	BNO			EM
23:00	25.5	15 / 0	16 / 352				16 / 355		16 / 355									om
00:00	25.5	2 / 0	23 / 375				23 / 378		23 / 378			8		163	BO	type 7		[illegible]
01:00	25.5	7 / 0	31 / 406				31 / 409		31 / 409									[illegible]
02:00	25.5	2 / 0	25 / 431				25 / 434		25 / 434						BNO			EM
03:00	25.5	14.5 / 0	27 / 458				27 / 458		27 / 458						BNO			EM
04:00	25.5	16.8 / 0	25 / 483				25 / 483		25 / 483			52	2.2	215	BNO			EM
05:00	25.5	14.6 / 0	23 / 506				23 / 506		23 / 506						BNO			EM
06:00	25.5	10 / 0	24 / 530				24 / 530		24 / 530									[illegible]
07:00	25.5	5 / 0	48 / 578				48 / 578		48 / 578									[illegible]

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Urinalysis

Time	Ph	SG	Blood	Protein	Ketones	Glucose	Colour

IDENTIFICATION

CLINICAL JUDGEMENT

ANTHROPOMETRIC

Clinical examination compared with anthropometry in evaluating nutritional status

J H Cross, C Holden, A MacDonald, G Pearmain, M C G Stevens, I W Booth

Archives of Disease in Childhood 1995; 72: 60–61

Anthropometric allocation to nutritional group

Group	*Clinical assessment*	*MUAC[2]: >12 months (centile)*	*MUAC[3]: <12 months (% of standard)*
A	Severe malnutrition	<5th	<75
B	Mild malnutrition	5th–25th	75–90
C	Normal	25th–75th	90–110
D	Over nutrition	>75th	>110

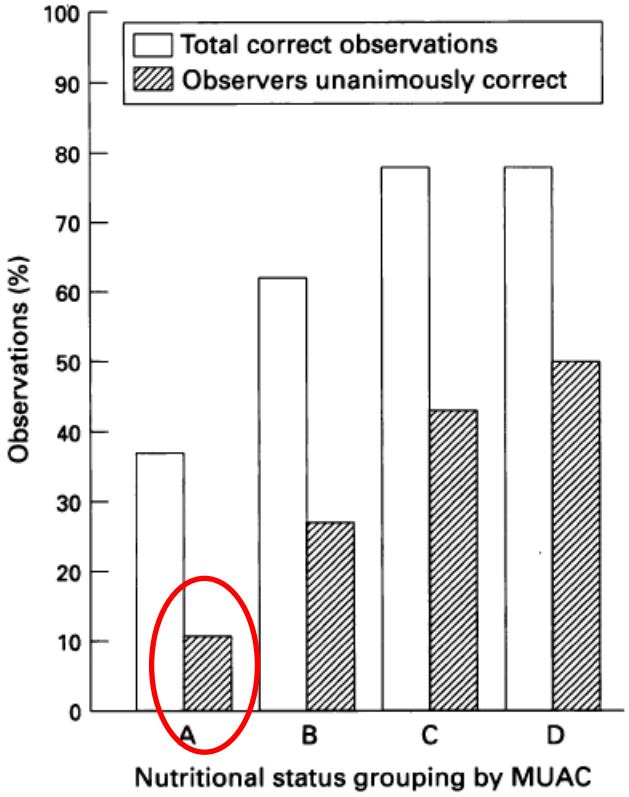

Figure 1 Histogram showing the number of correct observations of nutritional status by clinical assessors compared with MUAC grouping. The difference in concordance between group A and all three other groups was significant ($p<0{\cdot}05$).

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- To implement patient screening for nutritional risk.
- To identify patients who require nutritional support.
- To ensure provision of effective nutritional management for patients.
- To plan home nutrition after discharge.
- To monitor and evaluate practice.

IDENTIFICATION

Rate of completion

PYMS 86%

STAMP 84%

STRONG-kids 81%

Malnutrition risk in hospitalized children: use of 3 screening tools in a large European population[1–3]

Michael Chourdakis,[4,13] Christina Hecht,[4,13] Konstantinos Gerasimidis,[5,13] Koen FM Joosten,[6] Thomais Karagiozoglou-Lampoudi,[7] Harma A Koetse,[8] Janusz Ksiazyk,[9] Cecilia Lazea,[10] Raanan Shamir,[11] Hania Szajewska,[12] Berthold Koletzko,[4] and Jessie M Hulst[6]*

Am J Clin Nutr 2016;103:1301–10.

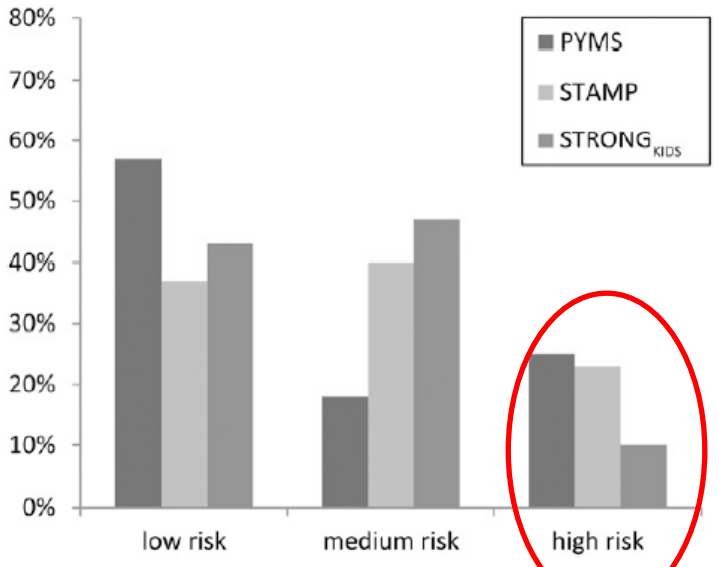


FIGURE 1 Malnutrition risk classification on the basis of the 3 screening tools expressed as percentages of the total number of assessed children for each tool. PYMS, Pediatric Yorkhill Malnutrition Score; STAMP, Screening Tool for the Assessment of Malnutrition in Pediatrics; $STRONG_{KIDS}$, Screening Tool for Risk of Impaired Nutritional Status and Growth.

TABLE 5
BMI SDSs within risk groups of 2–16-y-olds for 3 malnutrition-risk screening tools (n = 1253 of 1258)[1]

	PYMS			STAMP			$STRONG_{KIDS}$		
	Low (n = 757)	Medium (n = 222)	High (n = 274)	Low (n = 485)	Medium (n = 494)	High (n = 274)	Low (n = 575)	Medium (n = 550)	High (n = 128)
BMI SDS[2]	0.50 ± 1.25	0.23 ± 1.16	−0.78 ± 1.55	0.45 ± 1.18	0.14 ± 1.23	−0.27 ± 1.88	0.53 ± 1.26	0.05 ± 1.39	−0.88 ± 1.50
At least −1 SDS, n	687	190	147	437	410	177	518	434	72
<−1 to at least −2 SDSs, n	66	30	67	42	75	46	49	88	26
<−2 SDSs, n	4	2	60	6	9	51	8	28	30
<−2 SDSs and not categorized in the high-risk group, % (n)		9.1 (6 of 66)			22.7 (15 of 66)			54.6 (36 of 66)	

GUIDE CORRECT SUPPORT

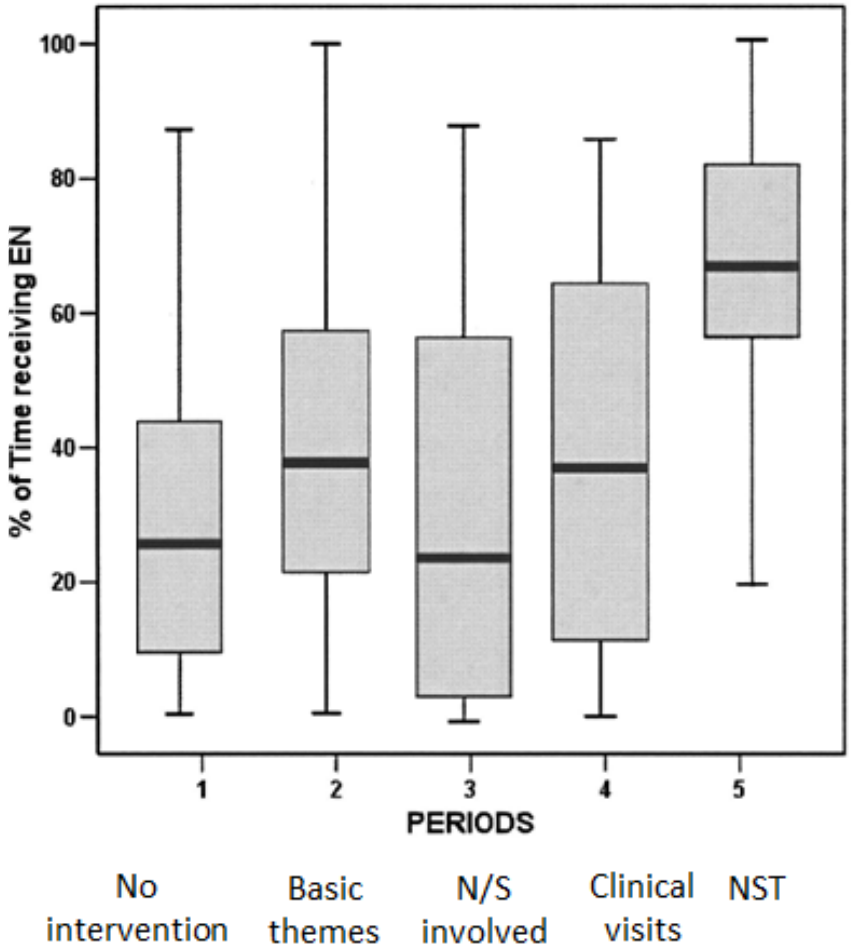
JOURNAL OF PARENTERAL AND ENTERAL NUTRITION

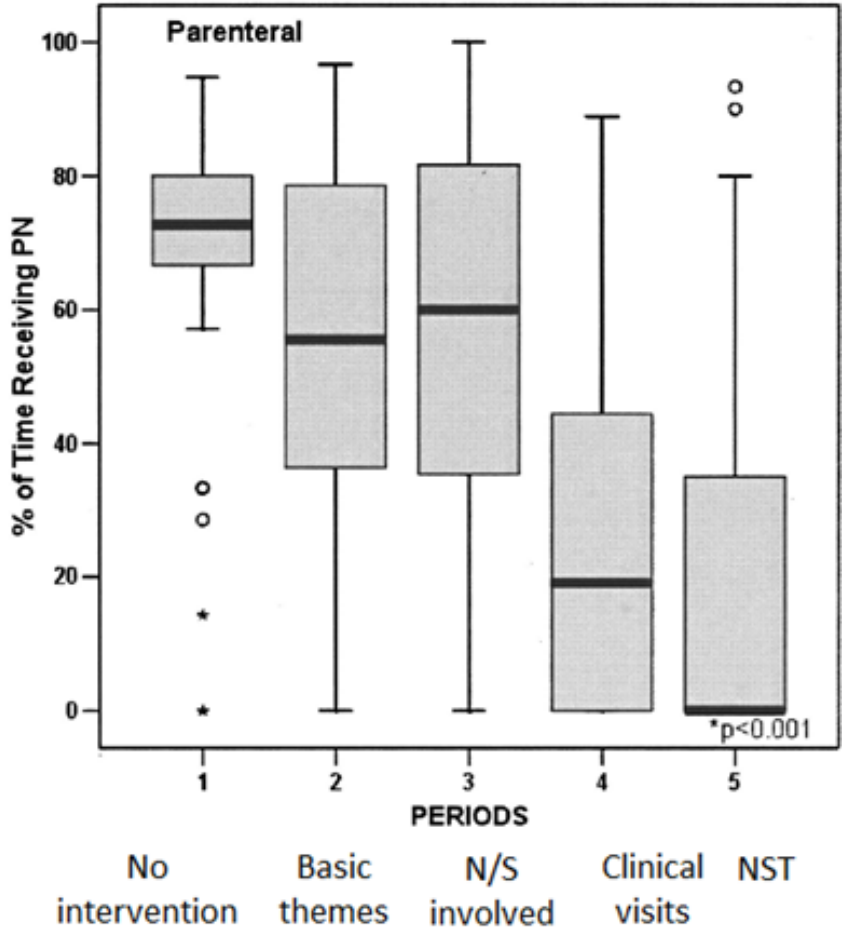
Original Communications

Outcomes in a Pediatric Intensive Care Unit Before and After the Implementation of a Nutrition Support Team

Gisele Limongeli Gurgueira, MD, MSc*; Heitor Pons Leite, MD, PhD†;
José Augusto de Aguiar Carrazedo Taddei, MD, DrPH†; and Werther Brunow de Carvalho, MD, PhD*

Journal of Parenteral and Enteral Nutrition **29**:176–185, 2005





GUIDE CORRECT SUPPORT

ESPGHAN 48th ANNUAL MEETING

Nutrition: Clinical Nutrition

PO-N-0390

PARENTERAL NUTRITION IN A TERTIARY PAEDIATRIC REFERRAL CENTRE

Cecilia Mantegazza[1,*] Gian Vincenzo Zuccotti[1] Niamh Landy[2] Laura Hughes[2] Susan Hill[2] Jutta Köglmeier[2]
[1]hospital Buzzi, general pediatrics, Milano, Italy, [2]Great Ormond Street Hospital, London, United Kingdom

	NCE POD		Current Audit	
	newborns No, Percentage	infants/children No, Percentage	newborns No, Percentage	infants/children No, Percentage
Appropriate	244, 92.4	62, 88.6	64, 95.5	214, 90.7
Indeterminate	4, 1.5	/	1, 1.5	12, 5,1
Inappropriate	16, 6.1	8, 11.4	2, 3.0	10, 4.2

MAIN ROLES OF THE NUTRITION SUPPORT TEAM

- To educate hospital staff with respect to identification and management of nutritional problems
- To implement patient screening for nutritional risk.
- To identify patients who require nutritional support.
- To ensure provision of effective nutritional management for patients.
- To plan home nutrition after discharge.
- To monitor and evaluate practice.

Original Communications

Does a Multidisciplinary Total Parenteral Nutrition Team Improve Patient Outcomes? A Systematic Review

Naylor, Carlie-Jane;Griffiths, Rhonda D;Fernandez, Ritin S
JPEN, Journal of Parenteral and Enteral Nutrition; Jul/Aug 2004;

ORIGINAL ARTICLE

Improved outcome of referrals for intestinal transplantation in the UK

Girish L Gupte, Susan V Beath, Sue Protheroe, M Stephen Murphy, Paul Davies, Khalid Sharif, Patrick J McKiernan, Jean de Ville de Goyet, Ian W Booth, Deirdre A Kelly

Arch Dis Child 2007;**92**:147–152. doi: 10.1136/adc.2005.090068

Table 3 Multivariate Cox regression analysis of children referred for small bowel transplantation

	Odds ratio	95% CI	p Value
Female *v* male	1.65	0.98–2.77	0.055
Age at evaluation: >2 years *v* <2 years	0.36	0.14–0.89	0.027*
Primary mucosal disorders *v* short bowel syndrome	3.16	1.37–7.31	0.007*
Motility disorders *v* short bowel syndrome	1.28	0.57–2.92	0.54
Absence of nutritional care team	2.55	1.44–4.52	0.001*
Serum bilirubin at assessment>100 µmol/l	3.70	1.83–7.47	<0.001*

*Variables with a p value <0.05 were considered to be significantly associated with a reduction in survival.

IMPROVING OUTCOME

ESPGHAN 48th ANNUAL MEETING
of the European Society for Paediatric Gastroenterology, Hepatology and Nutrition
2015

PO-N-0451

ROLE OF NUTRITIONAL SUPPORT TEAM IN IMPROVING OUTCOMES IN NEONATAL INTESTINAL FAILURE.

Akshay Batra [1,2] LV Marino [1] R.M. Beattie [1] Freya Pearson [1]
[1]Southampton University Hospitals NHS Trust, Southampton, United Kingdom

	Pre NST	Post NST	p value
Number	49	80	
Birth Weight (gms)	866.5	822.5	NS
Gestation Age (weeks)	26	26	NS
PN duration (days)	39	40	NS
SDS Weight at birth	-0.307	-0.239	NS
SDS Weight at discharge	-2.16	-1.37	0.03
Change in SDS weight from birth to discharge	-1.37	-1.83	0.04
Length of stay (days)	86.9	58.89	0.03

RESEARCH ARTICLE Open Access

The successful accomplishment of nutritional and clinical outcomes via the implementation of a multidisciplinary nutrition support team in the neonatal intensive care unit

Jeong *et al. BMC Pediatrics* (2016) 16:113

Table 3 Results of nutritional intervention

	Pre-NST ($n = 107$)	Post-NST ($n = 122$)	*p*-value
Energy ≥ 80 kcal/kg on day 7	45 (42.1 %)	77 (63.1 %)	0.001
Lipid initiation (d)	3.4 ± 1.5	1.8 ± 0.8	< 0.001
PN duration (d)	26.5 ± 22.2	22.1 ± 14.3	0.08
Time to initiation of enteral feedings (d)	6.4 ± 5.8	4.7 ± 5.1	0.016
Time to reach full enteral feedings[a] (d)	23.5 ± 16.2	18.8 ± 12.0	0.015
Weight Z-score at admission	−0.53 ± 1.13	−0.59 ± 1.25	0.690
Weight Z-score at discharge	−1.65 ± 1.01	−1.49 ± 0.99	0.235
Weight Δ Z-score during hospital stay	−1.13 ± 0.99	−0.91 ± 0.74	0.055

Values are expressed as means ± SDs or numbers (%)
[a]Full enteral feeding: ≥ 120 ml/kg/day

CONCLUSION

The role of the Paediatric Nutrition Team

Support and ensure correct nutritional management of those highest at risk

EDUCATION

IDENTIFICATION

PROVIDE CORRECT SUPPORT

IMPROVE OUTCOME

WORK AS A TEAM