To Our Readers

The current issue of the Update Series “Nutrition in Disease Management” incorporates two articles. The first of these stresses the importance of timely and appropriate feeding in the paediatric surgical patient. The article describes the metabolic changes occurring during surgical intervention, which may necessitate modifying the approach to nutritional supplementation suitably in specific settings. The routes of choice and the type of supplement to be admin-istered, based on specific indications, have been very clearly outlined.

The second article, “Feeding problems in children”, discusses in great detail the factors influencing the development of feeding behaviour in children and the practical approach to evaluate and treat a child with a feeding problem.

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Nutrition Support In A Surgical Patient

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Nutrition is very important for the growth and development of all living subjects. Nutrition deprivation can result in poor growth and healing during an injurious insult. Newborns are in a critical situation wherein the nutritional reserves are less than those of older children and adults. As compared to term babies, premature babies are more vulnerable to health injury due to compro-mised nutrients. Foetal growth is a continuous process and maximum weight gain is observed in the last trimester of pregnancy. After birth, infants show rapid growth and higher mental development. They gain weight daily.

Neonates suffer from life-threatening, surgically correctable, and sometimes incorrectable, disorders which further compromise nutrition. Fasting leads to hypoglycaemia at a faster rate in premature babies as compared to term babies. In a term baby, glycogen stores are 34 grams and can be exhausted in 20 hours if the baby is starved. The fat content of a premature baby is 3.5 per cent whereas that of a term baby is 16 per cent. The water content of a premature baby is 85 per cent whereas that of a term baby is 70 per cent. Nutrition deprivation in a surgical neo-nate/ child further depletes the small stores. When prolonged, this leads to poor brain growth during infancy. It also leads to impaired physical and intellectual de-velopment. Development of malnutrition also leads to poor healing 1,2 .

Fifty per cent of the children in developing countries are malnourished and 70 per cent of the children under five years of age are malnourished. In our country 30-40 per cent of the neonates have low birth weight and 10-12 per cent have low birth weight due to intrauterine growth retardation. In our paediatric surgical unit, 56 cases with various congenital disorders were admitted within seven days of life; 87.5 per cent of them were suffering from moderate to severe malnutrition; 80 per cent showed intrauterine growth failure; and 58 per cent recovered after surgery. This shows that nutrition has great impact on recovery from surgery during neonatal life. This also shows that preoperative nutritional status determines the outcome of the surgical procedure.

NUTRITIONAL ASSESSMENT

Preoperative assessment of nutrition is very important because it has a direct impact on post-surgical recovery. In newborn babies, maturity and gestational age must be recorded. Anthropometric parameters like weight, length/height and head circumference give enough information about the nutritional status of the children and are more practical. Measurements of triceps and sub-scapular skin-fold thick-ness and mid-arm muscle area can also help. These are not done to assess nutri-tion on a routine basis. Levels of serum albumin also give indirect evidence of nutritional status. Estimations of haemoglobin, prealbumin, retinal binding protein and transferrin levels are not of much value 3 .

ENERGY REQUIREMENTS

A normal newborn requires 40-70 cal/kg/24 hours for maintenance of metabo-lism, 50-70 cal/kg/24 hours for tissue synthesis and stores, and 20 cal/kg/24 hours to cover losses via excretion. On enteral nutrition (EN), a term newborn requires 100-120 cal/kg/24 hours whereas a premature infant requires 110-160 cal/kg/24 hours. As the age advances the requirements progressively decrease. Thus, for example, a 10-year-old child requires 60-80 cal/kg 24 hours and a 20-year-old needs 30-40 cal/kg/24 hours. On the contrary, a newborn requires 90-100 cal/kg/ 24 hours while on parenteral nutrition, as calories are not lost through excretion.

The resting energy expenditure of critically-ill infants is increased manifold dur-ing stressful conditions. Usually there is a hypermetabolic state and the neuroen-docrine stress stimulates gluconeogenesis, fat oxidation and protein catabolism. In newborns, this is less pronounced as the diversion of energy for growth occurs towards metabolic requirements. So during a stressful situation, there is no weight gain, and if the stress is prolonged, weight loss occurs. During the operation (perioperative period) the operative stress raises the resting energy expenditure for six hours but returns to normal within 12 hours. So there is no need to add extra calories during the perioperative period. The problem arises when nutritional sup-port is needed for complicated GI (gastrointestinal) surgery. Complications also develop from surgical procedure. These complications include sepsis, burst ab-domen, fistualisation, etc. Then cachexia starts if proper nutritional care is not provided in time 4,5,6 .

NUTRITIONAL SUPPORT (PARENTERAL OR ENTERAL NUTRITION)

Preoperative

Nutritional support is very important to strengthen the child for the operation. It is quite obvious that most neonates and children are malnourished. Surgical illnesses, congenital or acquired, lead to further lowering of intake. This may be due to loss of appetite, hypercatabolic state, lack of awareness and knowledge, and late referral to the tertiary care centre. Appropriate and adequate enteral nutrition should be pro-vided before operation, depending upon the age and disease of the child. Blood transfusion may be required to build up haemoglobin if it is low. When supplementa-tion of iron and vitamins becomes important, surgery can even be delayed.

Perioperative

During the perioperative period stress is involved. There is a transient increase in resting energy expenditure. But it can be taken care of on its own if there are no complications of surgery or intestinal atresia. This period lasts for 24 to 48 hours or may last a little longer in GI surgery where handling of the gut has been more. During this period N/5 (5 per cent or 10 per cent) dextrose saline with potassium is adequate for maintenance requirements.

As soon as the aspirate is nil or less than 50 ml/day, the child passes stool with bile, and bowel sounds are heard, enteral feeds can be started gradually. The presence of bowel sounds does not mean continuity of bowel 7 .

Postoperative

The invention of parenteral nutrition (PN) was the most important development in the field of nutrition in the last century. The most important is total parenteral nutrition (TPN), giving fully required calories for growth and recovery in a surgically or critically-ill child. Pre-maturity and surgical conditions like duodenal atresia, gas-troschisis, short bowel syndrome (SBS), small bowel transplantation, etc, require TPN for longer period. However, PN is not without risks. There can be complica-tions such as sepsis, cholestatic liver disease, chronic lung disease and atrophy of the mucosal lining of intestines 8,9,10 .

On the other hand, enteral feeding is required to maintain the continuity of the gut and gut mucosal integrity. If enteral feeding is not given, the gut mucosal barrier breaks down. This leads to translocation of bacteria and endotoxins via portal circula-tion and lymphatic drainage into the systemic circulation, resulting in septicaemia. Enteral feeds also provide glutamine, ketone bodies and short chain fatty acids (SCFA) which cannot be obtained during TPN. These are essential for the growth of the gut. The gut is a very important metabolic organ that keeps a check on our nutrient intake.

Moreover EN is cheaper, safer and simpler. For a surgical patient it is very im-portant in the preoperative and postoperative period. Even during TPN, a small amount of EN should be given in order to avoid atrophy of the mucosal lining of the intestines 11,12,13 .

HOW TO START EN IN POSTOPERATIVE PERIOD

After GI surgery, feeds as covered under the postoperative period can be started.

Whatever the child was taking before surgery can be given. The child can be put on a liquid diet in small amounts and given two-to-three helpings hourly. The amount ca be gradually increased depending upon tolerance. In case of vomiting, disten-sion or loss of peristalsis, feeding should be stopped. Very weak or premature babies can be started on gavage feed in the form of nasogastric or continuous slow feed at 1-2ml/kg/hour, but the intravenous line should not be withdrawn. Infants may not tolerate bolus feeds.

In the case of gastroesophageal reflux, continuous feeds are better tolerated. If gastric emptying is a problem, nasoduodenal or nasojejunal feeds can be started. Tolerance of oral feeds can be assessed by recording gastric residual volume, stool frequency and volume and presence or absence of blood, fat and reducing substances.

WHAT TO FEED

During EN, the energy requirement is more because of energy lost in stools and diet-induced thermogenesis. Breast milk is the best protection against necrotising enterocolitis (NEC) in neonates. Premature babies require further supplementation of minerals. Human milk and cow milk contain 0.66 cal/1ml. In order to increase the calories, glucose polymer and medium chain triglycerides (MCT) can be added. To 100 ml of cow milk add half a teaspoonful (TSF) of sugar and 3 ml of coconut oil (containing MCT). This is called enriched milk and contains 1cal/ml. It can be given to young infants to meet their calorie and protein requirements. An-other feed, available at our centre, is rice gruel. Pulses can be added to enhance the protein content of the feeds 13,14,15 .

Routes of administration 16,17	
Routes	**Indications**
*Oral – spoon and katori feeds *Older child can be fed	*Normal after GI surgery
*Nasogastric feeding	*Very weak, premature *Not accepting orally corrosive injury of oesophagus
*Continuous nasogastric feeding	*Gastroesophageal reflux *Not tolerating large feed
*Nasoduodenal	*Corrosive injury of stomach *Intolerance to gastric feeding *Persistent vomiting, GER
*Nasojejunal	*Acute pancreatitis *Intolerance to gastric and duodenal feeding
*Percutaneous endoscopic gastrostomy	*Swallowing difficulty *Neurological – gastropresis *Intolerance to gastric and duodenal feeding *Corrosive oesophageal injury
*Percutaneous endoscopic jejunostomy	*Acute pancreatitis *Intolerance to gastric and duodenal feeding
*Surgical gastrostomy	*Oesophageal atresia *Rest as under PEG
*Surgical jejunostomy	*Corrosive injury of stomach *Same under PEJ
*Tube across anastomosis after duodenal atresia resection	*Duodenal atresia

Great care has to be observed while feeding through these routes. Tubes of a proper size, made of silicone, are preferred. These tubes should not clog or kink. After giving the feed, the tube should be flushed with water to avoid block-age. The patient's position should be upright. The feed should go down with gravity and should not be forced. Initially feeds should be given by an experi-enced staff nurse or dietician. Parents must be trained in the feeding technique. Once the parents are confident, the patient can be sent home but should be monitored very closely. They should be asked to report immediately in case of any difficulty or dislodgement of the tube or any respiratory difficulty. Some-times there may be intolerance to bolus feed/large feed. In this situation, slow continuous feeding through the drip is necessary. Continuous feeding will be better absorbed simultaneously.

TYPES OF FEEDS

Calorie and protein requirements are different for different age groups. Feeds should be prepared accordingly. Gruels or liquid diets of milk, cereals, pulses, MCT and sugar are largely used. In case of extensive resection of intestine due to NEC, resulting in SBS, elemental diets containing glucose, amino acids and MCT are used. However, there is a problem of high osmolality resulting in diar-rhoea. This can be tackled by dilution and by slowly increasing the concentra-tion, or by using peptides or dipeptides instead of amino acids. Semi-elemental diets can also be tried out. With lactose intolerance, soymilk can be a substi-tute for milk. High-osmolality diet can result in dumping syndrome, diarrhoea, abdominal cramps and hypoglycaemia. Sometimes high-osmolality diet may lead to NEC. Intolerance to this diet indicates the need for TPN. After portoenterostomy following EHBA surgery, fats should be replaced by MCT. Adequate supplements of vitamins, mineral and trace elements should be given. The efficacy of any feed should be adjudged by achievements in weight gain and increase in length/height and head circumference in infants 18,19,20,21,22,23 .

TOTAL PARENTERAL NUTRITION

It is beyond the scope of this paper to cover all of TPN. But in a surgical case, especially one following GI surgery, the following are indications for TPN:

**Delay in recovery after surgery more than four days
**Congenital anomalies

- Intestinal atresia
- Meconium ileus
- Gastroschisis
- Diaphragmatic hernia
- Cardiopulmonary abnormalities

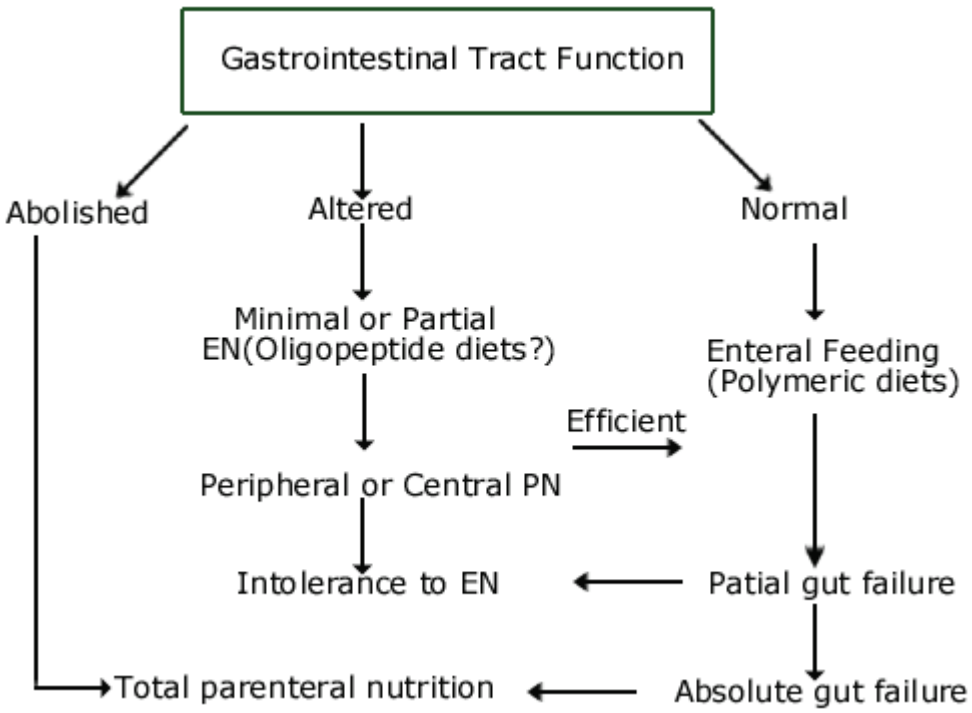
**NEC/gangrene of gut resulting in;

- Short bowel syndrome
- Intolerance to enteral nutrition

**Complications following surgery: sepsis, burst abdomen, fistula, poor weight gain, malnourishment, etc.

** Liver and small bowel transplantation 24 .

TPN in the best hands has changed the outcome of surgery on complicated congenital anomalies of gut in children. With this children show adequate weight gain. This may be required on a short- or long-term basis. The best example of a long-term basis for TPN is severe malabsorption in SBS. As mentioned earlier, maintained TPN has its own problems. Hence parenteral nutrition may be re-quired in certain conditions such as cancers of the GI tract, Crohn's disease, SBS, pseudo-obstruction and certain malabsorption disorders. Small amounts of EN should be given during TPN so as to maintain the integrity of the mucosal lining of the gut. In practical terms, in paediatric gastroenterology and paediatric surgical units, the following algorithm should be followed. Preoperative nutri-tional status determines post-surgical recovery 25 .



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Feeding Problems In Children

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Feeding and eating are among the most pleasurable human activities. Feeding provides not only the necessary nutrients for growth but also a plat-form for social interaction from mother and child. Feeding has to be viewed in the context of the parent-child relationship in a family unit within a specific cul-ture, with all these factors influencing each other. The physical act of feeding itself is a complex physiological process which is dependent on anatomic- integrity, neurological maturation of the structures and experiential learning provided to the infant. The intake of food for nutrition and protection of the airway are the two important components of normal feeding. The maturation of feeding skills over the first few years of life is influenced by growth-related changes and neurodevelopmental maturation coupled with learning by experience. A feeding disorder can be defined as inability, refusal or delay in eating age-appropriate food, or feeding behaviour which is not normal for the child.

DEVELOPMENT OF FEEDING SKILLS

The development of feeding skills parallels the motor development and dic-tates the types of food eaten and the manner in which it is presented (Table1).

At birth there is limited room in the infant's oral cavity and the tongue moves in and out in a extension-retraction pattern called suckling. A variation of this suckle is true sucking in which the lips close around the nipple and create negative pres-sure in the oral cavity while the tongue moves with mandible to extract liquid. In-fants use both sucking and suckling for feeding. However sucking is more efficient and is the predominant method in older infants.

At around six months the child can take pureed/semisolid food with a spoon, with the upper lip moving downwards to clean the spoon. Prior to that the child may suckle the pureed food.

Table I: Development of feeding skills in infants

Age in months	Food	Oral development	Motor skills
0–6	Milk	Suckle and suck	Reflex rooting and sucking, head control
6–8	Soft, pureed	Chewing pattern	Hand to hand transfer, sits without support
8–12	Ground, mashed	Tongue lateralisation	Pincer grasp, self feeding

12–18	Soft table food	Munching	Better hand-to-mouth coordination
18–24	Soft table food	Rotatory chewing, bites on cup	Runs, holds cup, uses spoon

Drinking with a cup requires further coordination of suckling, swallowing and breathing while maintaining a steady mandible movement. In the initial stages, the child may bite on the cup. Most infants can learn to drink from a cup after six months. There is a tendency to thrust out the tongue when fed with a spoon, which diminishes by six months. The infant slowly develops the ability to chew and swal-low a variety of solid foods over the next six months. The age of successfully eating solid food depends on the child's motor function, the complex interplay of the parent and child during meals, and the variety of food offered. Strong food prefer-ences and the capacity for independent eating develop together.

The mature swallow consists of an oral preparatory phase of bolus formation followed by an oral phase in which the tongue pushes the bolus posteriorly and triggers the swallow reflex. This is followed by two involuntary phases (pharyngeal and oesophageal) during which the epiglottis closes and the upper oesophageal constrictor relaxes. The food enters the oesophagus and then moves to the stom-ach. The infant swallow does not have the voluntary oral preparatory and oral phases but is otherwise similar.

Eating is a learned skill, unlike breathing, which is largely involuntary. Oral feed-ing in a neonate is entirely reflexive. Immediately after birth the process of learning starts with sensory inputs. With further maturation, feeding and swallowing gradu-ally changes from a reflexive to a volitional process 2 . Neurological maturation is important for the development of eating behaviour but experiential learning is vital. An important aspect of this learning is sensation and sensory feedback, which involves touch, pressure, taste and temperature. Other important factors are motor development of the child and types of food offered. It is widely believed that there is a critical period during which eating behaviour is learned. If the infant is not stimulated during this sensitive period, it becomes difficult for it to learn to eat 3 .However, this concept is as yet unproven.

Since the timing and variety of food offered to a child is under the mother's control, it is not surprising to see a great variation of eating behaviours in different socio-cultural backgrounds. However one must understand that the infant is not a passive recipient of the mother's care and actively stimulates parental response.

The personalities of mother and infant, their interpersonal relationship, environ-mental influences and culture all add to the complexity of feeding.

PATTERNS OF FEEDING AND TYPES OF FEEDING PROBLEMS

Infants below six months: Infants below six months: Infants below six months: Infants below six months: Infants below six months: At this age infants should be exclusively breast-fed. They are totally dependent on the mother for nutrition. Demand feeding ensures that the infant has control over the timing and

quantity of milk. The close proximity of the mother ensures good mother-child bonding. Feeding problems are infre-quent in normal, healthy, breast-fed term infants. Refusal to feed on the breast may occur in some situations (Table II). The mother may be concerned that she does not have sufficient milk. If the child is thriving well, passing dilute urine and sleep-ing well after feeds, the mother should be reassured that the milk supply is suffi-cient. The infant may be called for repeat weight check after two weeks.

Low-birth-weight babies can be started on mother's milk at the volume of 1ml/ hr as early as the first day without adverse consequences such as necrotising enterocolitis. In certain situations, especially if the child was born preterm (before 34 weeks), or had been sick in the neonatal period, the baby may require nasogastric feeding and the mother may have difficulty in maintaining lactation and breast feedings. It has been observed that if the mother is motivated and receives support and correct advice from health professionals, she can breast-feed her child even if the lactation had not been initiated in the immediate neonatal period. The transi-tion from nasogastric feeding to breast-feeding can be facilitated by non-nutritive sucking, avoiding the use of bottle-feeding, and encouraging spoon feeding.

Table II: Causes of breast refusal

**llness/pain	*Infection *CNS problems *Blocked nose *Oral thrush *Teething
**Faulty technique or difficulty in feeding	*Use of bottle/pacifier *Poor attachment * Breast engorgement
**Changes which upset the baby	*Maternal illness *Change in smell of mother *Separation from mother
**Apparent refusal	*Newborn – rooting * 4-8 months – distraction *1 year – self weaning

Besides prematurity, anatomic defects such as cleft lip or palate and central nervous system insults such as birth asphyxia and infections can result in inad-equate sucking and can interfere with feeding. These infants may present poor weight gain, excessive crying, or recurrent respiratory infections. Infants who are on prolonged tube feeding or intubation may develop oral hypersensitivity and generalised aversion to feeding.

Infants with tachypnoea due to respiratory or cardiac causes may have difficulty disassociating swallowing from inspiration. This also makes feeding difficult 4 .

INFANTS AT SIX TO 12 MONTHS

After reaching six months of age, the child is introduced to an increasing variety of pureed, strained and mashed soft foods, although milk still meets most nutri-tional needs. At around six months, the child is able to swallow soft food by suc-cessful coordination of the mouth and the tongue. The gag reflex is intact to pro-tect the airway. However it must not be overactive, as that would interfere with the movement of food to the back of the pharynx and oesophagus 5 . The normal mouth-ing of hand and objects at this stage perhaps facilitates feeding by modifying the gag reflex. Head control, trunk stability, eye-hand coordination, and increasing hand dexterity further facilitate self-feeding. The type of food introduced varies with the culture and the mother's socio-economic status. It is recommended that the food be calorie dense and offered to the child when he is hungry. Initially the child may have difficulty with the complex action of feeding and may spit out the food, which may be perceived as rejection of food. Feeding the child semisolid food at this age requires a lot more patience than feeding it liquids. However, with perse-verance and keeping in mind the need to develop the child's feeding skills, most mothers can coax children to eat common weaning foods. She must, however, continue to breast feed the child as often as required, especially at night. Refusal to feed or to take solids and growth failure are the common presentation of feeding problems at this age.

AFTER 12 MONTHS

After a year, the pace of growth declines, as also does the appetite. At the same time the child becomes increasingly active and interested in motor activities. Tod-dlers are easily distracted by playful activities at meal times and this can be discon-certing to the mother who feels inadequate in her nurturant role. Further, in infancy food choices are limited as the infant is totally dependent on the mother for food, which is primarily milk. With growing autonomy and self-feeding, the balance of power in the feeding relationship shifts. The preschooler becomes choosy and fussy. Young children's intake is directly related to feeding frequency, variety of foods offered, and energy density and parental control of child feeding 6 . Food preferences and dislikes develop during this period. This preference is dependent on familiarity with food and the social context in which it is offered. Children dislike food if they are forced to eat. They reject food if it is associated with unpleasant symptoms. The preference for certain foods, specially sweet and high-fat foods is innate. However, repeated experience with different kinds of food helps the child to acquire good eating habits. In the lower socio-economic strata of developing coun-tries, the availability and choices of food are limited. Moreover, the energy density of high-fibre cereal diet is low. This is a cause of widespread malnutrition. In the higher socio-economic strata, the problem is entirely different. In these strata, over-feeding of children and resulting obesity are common.

Most mothers are concerned about the lack of interest in food at this age. Par-ents should ensure proper mealtime behaviour in a gentle but firm manner. A re-laxed environment (without TV), with parents providing model eating behaviour, helps the child inculcate the social norms of proper eating behaviour. Common feeding problems encountered in young infants and children are enumerated in Table III.

Table III: Types of feeding problems

**Quantity or type of food	*Underfeeding *Overfeeding *Selective eating *Pica
**Problems in sucking/chewing	*Developmental *Possibly due to neuromotor dysfunction *Anatomic defects
**Abnormal mealtime behaviour	*Mutiple food dislike * Mealtime tantrums
**Delayed self-feeding	-
**Bottle dependence	-

EVALUTION AND TREATMENT OF A CHILD WITH A FEEDING DISORDER

The symptoms of feeding disorders include refusal to feed, failure to gain weight, aversion to a type of food and recurrent pneumonias. The initial evaluation should focus on the child's nutritional status.

Table IV: Causes of feeding disorders in children

:Disorders affecting appetite and ingestion:

- Deprivation–economic, psychosocial
- Nutritional deficiency, for example, iron deficiency
- Infection, for example, TB, hepatitis, urinary tract infection
- Metabolic disorders
- Neuromuscular
- Oral hypersensitivity, for example, after enteral feeding, intubation
- Fatigue, for example, heart disease
- Conditioned dysphagia, for example, GER

Disorders affecting oral, more pharyngeal and oesophageal swallowing:

- Anatomic defects of oropharynx for example, cleft lip or palate, macroglossia
- Anatomic defects of oesophagus, for example, TOF
- Disorders affecting suck, swallow-breathing coordination, for example, tachypnoea, choanal atresia
- Poor neuromuscular coordination, for example, cerebral palsy, bulbar palsy
- Mucosal infections, for example, candida, AIDS

- Disorders affecting oesophageal peristalsis, for example, achalasia
- Miscellaneous: hypothyroidism, Prader-Willi syndrome

The majority of children who are brought in by their parents for refusing to eat are healthy and have an appetite that is appropriate for their age and growth rate. Unrealistic parental expectations may result in unnecessary concern, and coercive feeding may aggravate the refusal to eat. In such a case only reassurance to the parents and regular weight and height check-ups are required.

On the other hand, with undernourished children, a proper evaluation is re-quired to rule out underlying medical conditions which may affect appetite, food-seeking behaviour and ingestion (Table IV). Nutritional deficiencies may perpetu-ate undernutrition by altering the food-seeking behaviour. Iron-deficiency anaemia is a common cause of anorexia and pica in our country.

An effort should be made to ascertain if there is a correctable anatomic or physi-ological problem. If there is a suspicion of a problem in the process of eating and swallowing, further evaluation is directed towards that end. Generalised aversion to feeding may develop if an infant aspirates or chokes during feeding or experi-ences pain while feeding This is especially seen in children after intubation or pro-longed enteral feeding. Refusal to feed is an unusual manifestation of gastroe-sophageal reflux but since reflux is a common condition, it is worth keeping in mind 7 . The explanation for refusal to feed is associated heartburn which makes feeding a painful experience as a result of which the child refuses to learn feeding. Observation of a feeding session can provide valuable information regarding mother-child interaction, the child's ability to handle oral secretions, pace of feeding, effi-ciency of swallowing mechanism and general coordination 8 .

Some diagnostic tests may be required in children who reject food completely. These include direct visualisation of the airway by endoscopy, radiographic stud-ies such as barium swallow, and videofluoroscopy. These help in defining ana-tomical abnormalities and also in studying the coordination of movement of bolus from pharynx to oesophagus.

Considering the number of causes of this problem, it is obvious that the treat-ment of each child will vary depending on the nature of the problem and evaluation (Table V). It may also vary at different stages of management. A child with trachaeo-oesophageal fistula may progress from surgical correction of oesophageal atresia to refusal to feed, due to an aversion to feeding. The child then requires behavioural modification. Similarly patients with cleft-palate may have feeding problems because of the inability to maintain negative pressure in the oral cavity. They may also have recurrent aspiration pneumonias.

As feeding is such a coordinated activity, it is not surprising that feeding prob-lems are frequent in children with neurodevelopmental problems with consequent malnutrition 9 . The assessment of feeding skills should be an integral part of the evaluation of a developmentally disabled child. Feeding skills should be assessed in relation to their overall level of neuromotor, mental, and social skills. Patients with neurodevelopmental problems require a multidisciplinary approach to man-agement. Oral facilitation or oral sensorimotor treatment along with behaviour modi-fication by a skilled therapist can gradually help the patient achieve feeding skills 10 . Even after intensive therapy some children may not be able to meet their nutri-tional needs from oral feeding. The indications for nasogastric feeding are severe PEM, recurrent aspirations and excessive feeding duration. Some patients may require gastrostomy feedings and treatment of GER.

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SEVENTH ANNUAL PENSA MEETING
The Seventh Annual Meeting of the Parenteral and Enteral Nutrition Soci-ety of Asia (PENSA) was held from August 24-26, 2001 in Bali, Indonesia. Dr Sarath Gopalan, Secretary of the Indian Society for Parenteral and Enteral Nutrition (ISPEN), participated as a speaker in the Scientific Programme and as a representative of ISPEN at the PENSA Executive Board Meeting. An important decision taken at this meeting was to host the PENSA 2003 (Ninth Annual Meeting of PENSA) in India, the likely venue being Chennai.

IX ASIAN CONGRESS OF NUTRITION

The IX Asian Congress of Nutrition is being jointly organised by the Fed-eration of Asian Nutrition Societies, Nutrition Society of India and Nutrition Foundation of India in India from February 23-27, 2003 at Hotel Ashoka, New Delhi.

The theme of the Congress is **'Nutrition Goals for Asia –Vision 2020'.** Many eminent members of the international scientific fraternity are expected to participate. The Congress will provide an opportunity to the entire nutri-tion fraternity to focus attention on current issues and future challenges in nutrition. It will also enable scientists to share their views and experiences on emerging problems, cost-effective interventions and help chart a future course of action on basic, clinical and operational research in nutrition.

The scientific deliberations will include eight plenary sessions, 35 sym-posia, 23 communication sessions and four poster sessions. Contemporary nutritional issues facing Asia, frontier areas such as biotechnology and mo-lecular biology, and advances in nutritional sciences will be covered in the discussions.

Topics of particular interest for the readers in the field of Nutrition Support Systems:

- Nutrition in Hepatic and Gut Disorders
- Probiotics
- Nutrition in the Critically-ill
- Fortification of Foods
- Referral Care and Management of a Child with Severe Malnutrition and Serious Infection
- Food Safety/Quality: Monitoring and Analysis of Environmental Contami-nants in Foods
- Nutrition and Cancer

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