



Centre For Research On
Nutrition Support Systems

Nutrition In Disease Management

**UPDATE SERIES 51
JULY 2011**

- **The Importance of Diet Counselling-
Indian perspective**
- **Case Study**
- **Pediatric Enteral Nutrition-protocol**

To Our Readers

Dear Readers,

The current issue (51) of the Update Series “Nutrition in Disease Management” of the CRNSS consists of a lead article, a case study, the principles underlying pediatric enteral feeding and an announcement regarding an important upcoming event in the field of Clinical Nutrition - the Apollo Hospital Clinical Nutrition Update being organized by the Indraprastha Apollo Hospitals, New Delhi on October 7 8, 2011 which is the third in a series of annual clinical nutrition updates organized by Indraprastha Apollo Hospitals.

The lead article discusses a subject of utmost importance and relevance to both aspiring as well as practicing dietitians - the art of diet counseling in the Indian context. This is followed by a case study describing a difficult clinical setting involving systemic infection, organ failure and muscle energy and protein catabolism in a situation which can challenge any nutrition support team in a hospital. The subject addressing pediatric enteral nutrition discusses the very basic issues involved in planning pediatric enteral nutrition and the important aspects to be considered in planning enteral feeding in children.

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The Importance of Diet Counselling- Indian perspective

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Diet Counselling is the art and science of counselling to help a client to reach his or her goals, related to his physiological condition. Using the science to develop methods to achieve the client's patho-physiological goals and using the art to help the client achieve these goals.

Diet Counselling is very important. It should be tailored to the age of the client and to the dietary practices followed by the family. There are different milestones in the life cycle which requires important diet advice, to mention a few:

A. Pregnancy:

In handling a client with pregnancy the role of a dietitian should be to do the following:

- Prevent pre-maturity and low birth weight deliveries
- Provide adequate weight gain during the course of pregnancy. People should be made to realise that there are no instant growth possible during pregnancy. The lost time to be made up in relation to the growth of the foetus is an uphill task at any stage of pregnancy. In the current scenario it is very common among the middle income and higher income group mothers where they are told to make the catch up growth as the foetus is undergoing IUGR (Intra-uterine growth retardation). Most often the reason for this is the woman is working and hence not listening to the body. Not eating enough and also not eating often to make up the extra requirement of proteins and calories. The micro-nutrients are usually given through oral supplements to make sure the pregnant mother does not slip into



deficiencies

- Encourage proper weight gain
- Use of contraceptives and methods used to help women conceive through in-vitro fertilisation and such newer techniques; the occurrence of twins and more foetuses at a single pregnancy poses newer nutritional challenges to the dietitian
- Gestational Diabetes Mellitus (GDM) is on the increase. The need of the hour is to handle diets for GDM. Most of the women with GDM are prescribed insulin and hence the challenges of avoiding hypoglycaemia, and prevention of ketosis is faced by the dietitian. Special skills are needed to design diets for GDM and hence emphasising the importance of diet counselling.
- Prevent or correct the deficiency of iron and folic acid which are related to low birth weight of the infants and neural tube defects in the new born infant
- Mothers who take relatively high levels of alcohol during conception increase the risk of oro-facial clefts in their off springs. In India, this awareness has to be brought in women planning to go in for pregnancies. It should be made part of the regular diet counselling protocol.

B. Lactation:

Breast milk is the best food for the infant up to 6 months of age. It is the most economical, immunological and hygienic way to feed the infant.

Emphasis on feeding the colostrums to the new born infant immediately after birth should be practised fervently. Stringent rules have to be practiced in hospitals to achieve this goal. Unfortunately in some private institutions the child is not fed by the mother even a couple of hours after birth.

Today in India lactation consultants are available to help the mother feed the infant. There should be enough preparation during pregnancy to prepare the woman's nipples to avoid cracks which can interfere with the feeding of the infant.



There are special tests and techniques which have been made mandatory to detect inborn errors of metabolism in the foetus and new born child. It is mandatory for dietitians handling such infants to update themselves of the latest formula available for feeding such children. These children cannot be given breast milk. In cases where such formula are not available the diet counselling techniques of the dietitian plays a major role in designing diets which can help in normal growth of the infant but does not harm by providing the nutrient or amino acid which the child cannot digest.

Dietitians should promote and support breast feeding by providing practical solutions to post partum women. They have to provide up to date information to pregnant women involving the family and community to provide solutions to remove institutional barriers to breast feeding.

C. Pre-School children and childhood:

It is important to transition the child to the cup once the child sits. A delay in this can lead to dental carries due to continued bottle feeding.

New Challenges for dietitians practising in India is the change in the society. Children are eating more meals away from home. This has led to overweight children. The activity of the children also has considerably reduced which has led to an increased number of children turning to be overweight.

Dietitians need to work with school canteens, school teachers and parent teacher associations to serve the right food. Home food can be made available at the canteens where the emphasis is on health and not only on taste of the foods served.

School teachers and parents need to be educated on the havoc that junk food can play in a child's life. Dietitians have to come out with smart options for diet to be served at the canteens. Millets, fresh fruits, vegetables and whole grains should be part of the child's daily diet. These steps will help in combating over nutrition and the hidden hunger for vitamins and minerals present in our children.

Proper diet counselling can prevent the existing deficiencies seen in children such as iron, folate, zinc, magnesium, selenium etc.

Healthier choices can be designed by dietitians for desserts and sweet meats served to the children. Providing relaxed atmosphere at meal times and such behavioural changes will go a long way in de-



stressing the child.

There are some parents who use food as an emotional crutch to make up the lack of time they are spending with the child because of full time jobs. Parents need to be educated on such matters and it should be prevented.

One third of our children leave to school without breakfast. This leads to a host of issues and leads to nutritional deficits in the child's diet which affects the child's performance in school. Dietitians have to make diet counselling a multi faceted approach to handle these psycho social issues related to the child's growth and behaviour.

Recently there is a mushrooming of boarding schools. Dietitians have to work with the canteens to provide healthy options for the children. Diet advice which is individualised to the child can be promoted through advanced information management systems used by these schools. The child can be guided to choose the right foods through tabs kept on what the child buys through the coupons given to buying snacks. Healthier choices should be provided on canteen and snack outlets of the school.

D. Adolescence:

Obesity is an increasing trend noticed in India, In nutritional assessments to be designed for adolescents the following should be included such as Meal skipping, sweets at odd hours, sports requirements to mention a few. Achieving behavioural changes is a big challenge with children and teens. Teens spend most of their free time video gaming, watching television or surfing the net. Proper intervention and counselling has to be given to loose weight in obese teens. Adequate calcium intake should be ensured as a greater per cent of the teens are avoiding milk and milk products. With ore intake of junk food protein could be insufficient in their diet. With the eating out culture and less options available for healthy foods, interventions needs to be planned for providing healthy options while eating out. Dietitians need to teach the teens to choose the right options.

E. Sport's Nutrition:

Special dietitians have to take care of the diet needs of children and adults who engage in active sports. Pre and post event meals have to be designed to increase the performance.



F. Geriatric Nutrition:

With more centenarians and more and more people in the 8th and 9th decade of their lives, special diet options have to be provided. People who are staying alone, those in old age homes and those who go to day care centres for senior citizens need special care and well designed meals. If a group of dietitians can get together and provide meals on wheels for senior citizens it will be a big step forward. Due to age and mobility issues they find it difficult to fix a proper meal for themselves. This can lead them into nutritional deficiencies. The cause of malnutrition in the elderly could be because of poverty, ignorance, depression, chronic disease, poor dietary intake and mental and physical disability. A multi-disciplinary approach needs to be designed to handle issues of geriatric nutritional needs.

G. Dental Issues;

In the name of liberalisation and globalisation, all kinds of products which are low in fibre and high in sugar have flooded the market. This is leading to a lot of issues such as dental carries, root canal treatments, etc. Proper diets or products with calcium, vitamin D and C are important.

Meticulous oral hygiene is important. The dietitian never used to be part of the rounds in the dental ward but today the emphasis on diet and its role to prevent damage to the teeth has been well understood. The dietitian and dentist have to work together in cases where children are prescribed braces, this changes their diet. How to include all nutrients in a meal which is semi-solid is a challenge to the dietitian. Usually this is during the adolescence and it should not affect the growth spurt of the individual. These children should be taught to have fruits in cut form and should not move away from fruits and vegetables.

H. GERD (Gastro-oesophageal Reflux Disease):

This is a condition very common among young adults aspiring to climb the ladder of success. Long hours of work, stress due to impractical deadlines causes wrong eating patterns. They are skipping meals and snacking to appease the hunger. They end up eating fried foods and baked foods. Dietitians have to work at behavioural changes of



handling stress, right eating patterns and eating at the right time.

I. COPD, Chronic Obstructive Pulmonary Disease:

COPD is on the increase in India. People with COPD cannot take large meals. We need to improve immunity through antioxidants. Dietitians need to be provided with adequate hydration, vitamins C, B₆ and E. Micro-nutrients such as Selenium and magnesium are also needed. If the client can tolerate it helps to increase the intake of omega 3 fatty acids.

J. Cardiac Disease:

India is the global capital of cardiac disease. Cardio vascular disease includes hypertension, coronary heart disease, heart failure, congenital heart defects and strokes. An average four member family consumes in India about 250 gms of vegetable in a day. There needs to be aggressive programmes to increase the consumption of vegetables and fruits. Fruits intake is also a real low in most of the population. Can there be Dietitians who can work with the government and work on policies to decrease the cost of fruits and vegetables. This decrease in cost can partly increase the consumption of fruits and vegetables and indirectly reduce issues causing cardiac disease. We need team work where the dietitian, physiotherapist and doctor need to work together to run prevention programmes in clients with high risk towards cardiac disease. Life style changes includes exercise training, nutrition counselling and other interventions based on behavioural change models.

Dietitians have a major task in hand to handle clients with cardiac disease. The market is flooded with high calorie, low fibre and high sugar foods; the task of teaching people to choose right, the healthier options available lies with the dietitian. One needs to work on providing healthier options. The goal should be to increase the consumption of fruit and vegetables and decrease the consumption of processed foods.



K. Diabetes Mellitus:

India being second globally for Diabetes Mellitus, we need to take strides to prevent this epidemic. As we may not have enough doctors and hospital facilities to take care of the complications which are going to come related to this disease. We need to prevent the people having Impaired Glucose tolerance from proceeding towards Diabetes. Teach people with Diabetes to lead the right life style to control the disease and prevent the morbidity and mortality related to the complications of the disease.

Dietitians in India have a multi-faceted role to play and need to go headway to prevent the issues related to over nutrition.

References:

Stump, S.E., Nutrition and Diagnosis Related Care, 6th edition, Lippicott Williams and Wilkins Palvige B, Andrea AM et al., An educational model to improving diet counselling in primary care. A case study of the creative use of doctors' own diet, their attitudes to and to nutritional counselling of their patients with diabetes.



Case Study

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The case discussed is that of a 23 years old male with no previous history of any medical illness. The only symptom was loose stools for two days prior to a five kilometer long run which he undertook as part of a Border Security Force training programme. Shortly after this activity, he had a generalized tonic-clonic seizure (GTCS), for which he was taken to the hospital, treated and discharged at night. However, the next day, his consciousness worsened and his urine output decreased - he was immediately brought to PSRI. At the time of admission, the patient had altered sensorium and had been anuric for one day. On examination he had bitten his tongue and had abrasions on left and right knee and right elbow. There was no fever, cough, dyspnea or hematuria. His vitals were :-

Temperature 99° F, Pulse 106 beats/min, Respiratory rate 20/min, Blood pressure 96/45 mm/Hg, RBS 153mg/dl, O₂ sat 95 % The patient had acidotic breathing and was not oriented to space and time.

The blood investigations at this time revealed deranged renal function (serum creatinine level 6.6mg/d) and marked increase in liver enzymes (SGOT / SGPT 5369/4096 U/L). The patient remained anuric and had tachycardia and tachypnoea. Patient was managed with intravenous fluids, antibiotics, noninvasive ventilatory (NIV) support, regular hemodialysis and other supportive medication and care. Creatine phosphokinase (CPK) levels were very high 4956 U/L. Based on clinical data, a provisional diagnosis of rhabdomyolysis with acute renal failure and multiple organ dysfunction was made.



In accordance with our protocol, the nutritional status of the patient was assessed within 24 hours of admission using the subjective global assessment (SGA) tool. The initial assessment, as expected, was in the 'A' (well-nourished) category as the illness was acute in nature. In the clinical setting of sepsis associated with deranged hepatic and renal function, the patient was unable to meet his energy and nutrient requirements.

He refused to get the nasogastric tube inserted. Therefore, meeting his enhanced nutritional needs was a challenge despite an energy - dense diet. The only option left was to initiate partial parenteral nutrition and allowing as much oral intake as possible. According to his body weight (60kg) the energy and protein requirements were very high (40 kcal/kgbw and 2gm protein/kgbw). The total daily energy and protein requirement was 2400kcal and 120gm protein, respectively. Sepsis, increased respiratory effort and the need for repeated dialysis, all contributed to both increased energy and nutrient requirement.

Owing to the overall poor general condition increased metabolic demands and poor oral intake, the nutritional requirement could be met only partially which resulted in the patient beginning to lose weight.

Over the next two weeks, while, on the one hand, his clinical and biochemical parameters improved, on the other, he developed psychosis. He was shifted to the ward where he was managed for the next few days.

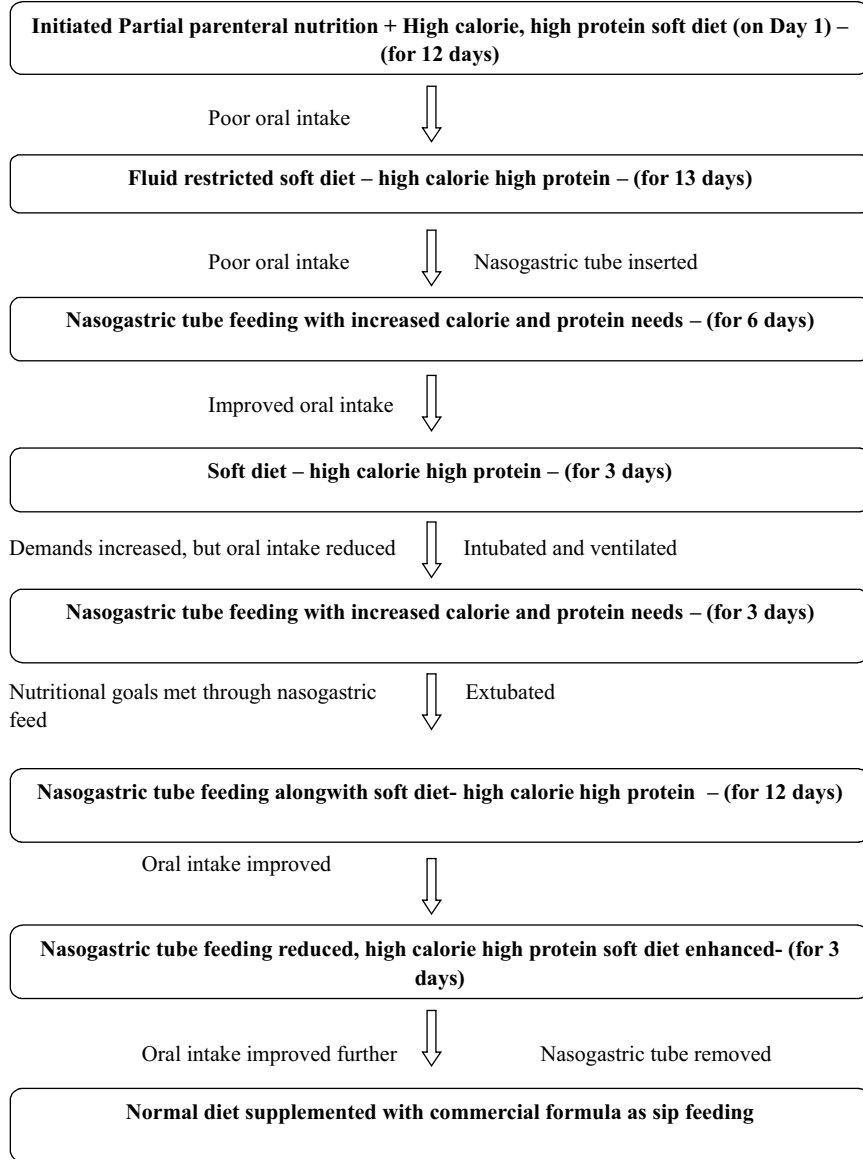
His clinical condition was stable for a couple of days but suddenly developed acidotic breathing. He had to be shifted back to the ICU in a state of altered sensorium, when he could not communicate verbally. He had significant weight loss (about 20 kg), muscle loss and respiratory efforts were poor, hence was intubated and ventilated. Nasogastric feeding was initiated in an effort to meet his daily energy and nutrient requirement.

Parenteral nutrition was discontinued at this stage as the patient's daily target goals with respect to energy (2100 kcal 35kcal/kg bodywt/day) and protein (90 gm 1.5 gm/kg bodywt/day) requirement was being provided adequately using the enteral formulation alone. With appropriate intensive care (ventilator, tracheostomy care, antibiotics, etc.) and good nutritional support, the problems of sepsis, renal failure and loss of muscle mass were resolved. This led to significantly improved respiratory effort and the patient could be weaned off the ventilator. Even after the patient was weaned off the ventilator, nasogastric feeding was continued and shortly thereafter, blenderized soft diet was also introduced.

Over the subsequent few days, his oral acceptance gradually improved and the nasogastric tube was removed. Currently, the patient is consuming a normal diet supplemented with commercial formula as sip feed to meet his energy and nutrient requirement.



Course of Diet Events



Pediatric Enteral Nutrition-protocol

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Recent advances in medicine in the past few years have witnessed a mushrooming of specialties and sub-specialties. Sophisticated techniques are now available to aid the rapid diagnosis of clinical disorders related to these sub-specialties. India is no exception and the past 10 years have seen considerable progress in this regard.

In the glamour of performing sophisticated techniques like gamma knife surgery, 'Nutrition', a specialty of medicine which is applicable to every patient has unfortunately been relegated to the background. The probable reasons for this in India are:

- ✍ Lack of awareness of the importance of nutrition as a powerful therapeutic tool more in our professional colleagues than among the public.
- ✍ Nutritional support requires patience and results need to be viewed on a long-term rather than short- term basis. Performing a complicated procedure like laser surgery attracts instant publicity in the media. Nutritional support on critically ill patients receives scant attention.
- ✍ A preconceived notion that an effective nutritional support service is prohibitively expensive and not affordable by most people in India. Post-operative care in the Indian situation and is often found wanting because of inadequate nutritional back-up.

Enteral nutrition is always preferred to parenteral nutrition because:

- a. it is more physiological
- b. it costs approximately eight times less than parenteral nutrition.
- C. it is simple to administer.
- d. it is associated with much lesser incidence of complications.



The dictum is- where the gut is available use it. **General principles which must be followed in administration of nutritional support are:**




1. An effort should be made in hospitalized patients to detect malnutrition at an early stage.
2. Patients should be considered malnourished or at risk of developing malnutrition if they have inadequate nutrient intake for 7 days or if they have a weight loss of 10% of their pre-illness body weight.
3. Patients who cannot maintain adequate oral intake and are candidates for nutritional support should be considered for enteral tube feeding first.
4. Enteral tube feeding and parenteral nutrition should be combined when enteral support alone is not possible.
5. When administering nutrients enterally, gain access to the gastrointestinal tract in the most natural and least invasive manner, including supervised trials of oral intake and tube feeding.
6. Use the parenteral route only when the patient is at risk for malnutrition due to poor oral intake, a trial of enteral feeding has failed, or severely diminished intestinal function due to underlying diseases or treatment is anticipated.
7. Malnutrition should be corrected at a judicious rate and overfeeding avoided.

A major limiting factor regarding enteral preparations in India has been the high osmolarity of the preparation. A high osmolar load may lead to diarrhea, electrolyte and nutrient malabsorption, thereby, adversely affecting the nutritional status further. The osmolarity of an enteral preparation should preferably not exceed 350 mosm/L. An osmolarity exceeding 400 mosm/L is likely to cause diarrhea when such a preparation is administered through the gut. It is possible to make an enteral preparation calorie dense without significantly increasing the osmolarity by increasing the fat content of the preparation. It is erroneously believed by patients and even treating practitioners that a high fat content would cause diarrhoea and worsen malabsorption. On the contrary, fats have an osmolarity which is very similar to plasma and there is evidence to show that infants can tolerate enteral preparations having upto 55% of total calories derived from fats, very well.








Indications for enteral nutrition support

There are number of clinical conditions where the child may be completely or partially unable to consume food orally or the oral intake may be grossly inadequate and any of the three broad categories of enteral nutritional preparations may be provided:-

-  **Broad-based enteral feed preparation for general use** in the hospitalized/convalescing patient.
-  **Enteral feed preparation designed for use in specific clinical situations** with suitable modifications in the ingredients (hepatic, renal, diabetic).
-  **Elemental diets**

The important points to be considered in designing an enteral feed are:-




-  **Nutritional completeness** can be ensured by evaluating the product for nutrient quality and quantity.
-  **Lactose content** of the feed should not be kept very high since transient lactose intolerance (post-infective) is not uncommonly encountered after an episode of gut infection.
-  **Osmolarity** - Diarrhoea can occur with the delivery of hyperosmolar solutions directly in to the small bowel. Feeds with an osmolarity higher than 400 mOsm/ litre are associated with feed intolerance in the form of diarrhea. It is possible to minimize the possibility of diarrhea even with a hyperosmolar feed by increasing the proportion of free amino acids in the feed (eg:- elemental and semi-elemental preparations).
-  **Caloric density** is the quantity of calories per unit volume. Commercial products with caloric density ranging from 1-2 kcal/ml are available for adults. Caloric dense products are used where fluid restriction is necessary. While designing home based blenderized feeds, it is difficult to design feeds exceeding 1.5 kcal /ml density.
-  **Metabolic utilization-** In certain disease states, the ability to utilize certain nutrients may be altered (eg :-in hepatic impairment, metabolism of dietary long-chain triglycerides (LCT) is affected. In this situation, fat supplementation with a higher proportion of medium-chain triglycerides (MCT) will increase the bioavailability of fat and also not affect the osmolarity in the gut significantly. Supplementation with a higher proportion of branched-chain amino acids (BCAA) may be useful in the initial 48 hours after onset in hepatic encephalopathy.



Administering the feed

In pediatric patients, a combination of oral and tube feeding is preferred if the patient is fully conscious and the swallowing mechanism is intact. It facilitates transition from tube to complete oral feeding. Bolus feeding is more physiological and practical for home use. The feed can be administered at the interval of two to three hours beginning with 25%- 50% of the total recommended fluid volume per day.

Continuous feeding is better tolerated than bolus feeding in children unlike adults, particularly in patients with poor digestive capabilities. It is ideal for overnight supplemented feeding. Continuous feeding is started at a slow rate according to the following protocol:-

	Full term infants	1-20 ml / hr
	Children	10-30 ml /hr
	Adolescents	25-30 ml /hr

Begin with lower concentration (0.5-0.6 kcal/ml) in 1/3-1/2 the desired volume per day. Increase volume slowly and then increase the strength of the feed to facilitate maximum calorie intake. Watch for abdominal distension, diarrhoea, emesis and gastric residuals. If intolerance develops, return to previously tolerated strength and advance more slowly.

Both macro nutrients and micro nutrients must be provided in adequate amounts according to age and level of activity of the child in order to enable growth and development within normal parameters despite metabolic disturbances.

It must always be kept in mind, however, that the nutrient requirements have to be tailored to meet the needs of an individual patient. Although there are broad guidelines, it would seem appropriate to adopt a flexible approach during administration of nutritional support.



FIRST ANNOUNCEMENT

3rd CLINICAL NUTRITION UPDATE APOLLO HOSPITALS GROUP



Venue:
**Indraprastha Apollo
Hospitals,
Sarita Vihar, New Delhi**

7th & 8th October, 2011

Apollo Hospitals Group, for over 27 years has continuously excelled and maintained leadership in medical innovation, world-class clinical services and cutting edge research. As being one of the largest hospitals group in the world, we are consistently ranked amongst the best hospitals globally for advanced medical services.

The philosophy of the Department of Dietetics in our Group is to establish and encourage good nutritional practices and standards as an integral part of the health care provided. We are dedicated in providing the highest quality patient focused nutrition care, to advancing practice of clinical nutrition, and to educate future Dietitians and other healthcare providers. We take constant efforts to continuously update and upgrade in the field of clinical nutrition which has helped us adopt an approach for quality improvement to benchmark our nutrition practices.

Department of Dietetics, Apollo Hospitals Group is delighted to announce the 3rd Clinical Nutrition Update 2011 with the theme of "Sharing Knowledge and Practising Together" for all practising Dietitians of India on 7th and 8th October, 2011 at the Indraprastha Apollo Hospitals, Sarita Vihar, New Delhi.

The main goal of this update is to enhance the knowledge of the Dietitians by sharing the evidence-based best practices in Clinical nutrition, by the exchange of ideas and knowledge between different disciplines (Eminent medical professionals and Dietitians) to facilitate research and clinical interdisciplinary collaborations, focusing on better nutrition practices.

We indeed take immense pleasure to invite and welcome you for the participation to our informative update.

PROPOSED TOPICS

Adult Nutrition

- Evidence based Nutrition practices in treating critically ill.
- Nutrition management of Head and neck cancer
- Nutrition guidelines and Practices in kidney disease – Is there a “Gap”?
- Importance of Nutrition guidelines in Post Bariatric
- Nutrition in Trauma
- Nutrition planning for patients with stroke
- Nutritional optimization of pre and post operative patients undergoing organ transplan

Pediatrics

- Parenteral Nutrition in the Critically ill child
- Nutritional management of post cardiac surgical complications
- Inborn errors of metabolism
- Interesting case presentations

REGISTRATION

Registration fees : Rs. 1000 /-

Last date for Registration : 30th August 2011

Spot Registration : Rs.1250/-

Completed registration forms, with a DD payable in Chennai for Rs. 1000 /-, in favour of “**Department of Dietetics, Apollo Hospitals**”, to be sent to The Department of Dietetics, Apollo Hospitals, 21, Greams Lane, Chennai- 600006. Phone (044)28296637/6715

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