

BASAL METABOLIC RATE

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THERE is no living being in the world which does not require energy for its survival. Energy is primarily derived from foods. An individual is either at rest or at work, constantly requires energy for his heart to beat, his lungs to breathe and other vital organs of the body to function, to make life going. Race, age, sex, nature of work, climate, functions of endocrine glands, emotional factors, the quality and quantity of food influence the energy requirements of an individual.

Before we consider Basal Metabolism let us become familiar with certain terms which we may find during the course of our study.

Respiratory Quotient: It is the ratio of CO_2 (Carbon dioxide) liberated to the volume of O_2 (oxygen) consumed by the body. This principle is based on the fact that oxygen is utilised in all the oxidative degradations of carbohydrate, protein and fat.

Caloric Value of Foods: It is defined as the quantity of heat produced when food materials are oxidised or burnt in oxygen. This is determined by using Bomb calorimeter.

Calories: A small calorie means, it is the amount of heat necessary to raise the temperature of one gramme of water to one degree centigrade. The large calorie or the kilo calorie means it is the amount of heat required to raise the temperature of one kilogramme of water to one degree centigrade.

Basal Condition: This is a situation where an individual is kept at lowest activity possible under normal health to enable him to spend the minimum energy required for sustaining life. In other words a person is

at rest physically, mentally, kept under optimum environmental temperature having normal body temperature and in a post absorptive state (14 to 18 hours after taking food) is considered to be living under basal conditions.

Basal Metabolic Rate (B.M.R.) may be defined as the amount of heat produced by the body under basal conditions per square meter of body surface per hour. B.M.R. is estimated in two ways. (1) Direct Measurement of heat produced by the body, placing the subject in an insulated chamber. Now this procedure is only of academic interest which is also very expensive and hence not in vogue. (2) Two systems are employed in estimating the B.M.R. through indirect method. (i) Open circuit system. In this procedure an individual is allowed to breathe the atmospheric air of a known composition in a given time. The expired air is collected into a bag. The volume of Oxygen (O_2) and Carbon dioxide (CO_2) are analysed and Respiratory Quotient is determined. Once the R.Q. is known, the calorific value of one litre of O_2 can be obtained and the heat production over the period of experiment is arrived at and total calories required for the day under basal conditions are calculated. (ii) Closed Circuit system, in this method a known quantity of O_2 is made available to the person. He is allowed to breathe in and breathe out into same apparatus in which the measured quantity of O_2 is kept. The expired CO_2 and H_2O are allowed to get absorbed into the soda lime. The decreased quantity of O_2 from the apparatus is directly proportional to the quantity of O_2 consumed by the subject. Experiments have shown that the R.Q. of an average adult is approximately 0.82 under basal conditions. At this

R.Q. the calorific value of one litre of O_2 is 4.825 calories. The total calories required under basal conditions for a day are calculated based on the total volume of O_2 necessary for the day.

The normal B.M.R. for an average adult is about 36 to 40 calories per square meter of body surface per hour. The surface area of an average Indian is calculated to be around 1.8 square meters. Hence an average individual would require about 1350 to 1550 calories per day for his maintenance under basal conditions. In case of females the B.M.R. values are about 5 to 10 per cent lower than males.

Variations in B.M.R.

Basal Metabolic Rate is increased in hyperthyroidism, cold climates, anxiety, pain, fear, insomnia, discomfort, mental agony, over exertion, obesity, hyper function of adrenals or anterior pituitary gland, specific dynamic action of foods and during the period of pregnancy and lactation. A number of drugs also accelerate metabolism when administered in the treatment of different diseases, e.g. epinephrine, caffeine and nicotine (smoking).

B.M.R. is decreased in hypothyroidism, hot climates, sleep, malnutrition, sedentary life, starvation, hypofunction of adrenals and anterior pituitary glands, shock and old age. Use of sedatives also lower the B.M.R. slightly.

Now it is clear that every individual requires certain minimum amount of energy to maintain the vital functions of the body. Apart from this he has to attend to his daily work for which extra energy is required to maintain the energy equilibrium.

(Continued on page 310)

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NURSE AND AIDE : A NURSING ASSISTANT'S POINT OF VIEW

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Yes, at times, the numerous complaints of patients, the never-ending tasks of making beds and administering baths, and the constant emptying of bedpans, among numerous other chores, all seem to pile up to produce the typical, harried nurse and nursing assistant. Yet everything boils down to the certain quality of care given to the patient in a manner which is both effective and efficient. I realize, as a nursing assistant myself, that the cooperation between a nurse and her aide is of utmost importance and any gaps in total teamwork must not occur.

The work load should be divided up according to how much each party should be able to handle in regard to her training. I know that a nurse is knowledgeable and is able to do all of the duties included in my position, in addition to other tasks, such as charting patients' progress and dispensing medications, which only she can undertake and which I am not legally permitted to do. Thus, the aide should try her best to deliver patient care so that her team leader is able to direct her attention to other important matters. If possible, the aide and her nurse should work with each other in various activities such as making beds and bathing patients, for a team always functions better and faster as compared to an individual worker. One person on the team can start patient care or finish where the other left off. All of this cooperation saves so much time and trouble, which is one of the most important concepts in nursing.

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Both nurse and aide should keep in mind that one should not depend too heavily on the other for completing certain chores, or the working relationship will be seriously damaged. The team member will resent having to work with her partner, for she will feel that she is doing all the work, while the other either does not help enough or does not participate at all. The most likely result will be that the uncooperative worker will gain such a reputation among the staff that no one would even desire to work with her.

The registered nurse and nursing assistant should not let their titles alone determine which tasks are demeaning to their positions and which are not. As an example, one day I was totally engrossed in the morning routine for a postoperative patient, when my team leader left a commode in the hallway outside of the room and told me to have it cleaned. There was no reason why she could not have done the job, as she certainly had enough time, and the utility room was already on her way. Conservation of time is what a team should strive for as opposed to the allotment of tasks according to what is proper for each member's title. Titles amount to nothing when a patient's care and life are at stake. A head nurse has just as much duty to assist patients as do the nurses and nursing assistants under her leadership.

Communication between people is the basis of all interactions within a hospital's daily existence. The nurse must make sure that all those under her supervision and working with her, understand exactly what is expected of them, for no room for any mistakes can be allow-

ed in regard to patients' health. Reports must be delivered clearly and concisely with all matters explained thoroughly. The aide must not be afraid and should be encouraged to pose questions, for learning is, after all, an everyday process, even for those who believe they have incorporated all of the knowledge there is to be had.

Individuals should not abstain from voicing their opinions, criticisms, or complaints in regard to each other. How else would people realize what their faults and virtues are? This is especially important in the relationship between a nurse and her aide. The harbouring of feelings may be unhealthy for the partnership, so both parties must make it known what they do and do not expect from each other. Grudges would best be brought out in the open, so immediate steps can be taken to rectify the troubling situation.

The alliance of a nurse and her assistant does not come about quickly or easily, for each must work and learn from each other one step at a time. If each member puts forth a considerable amount of effort on her part, all of these steps will eventually lead to a union in which both persons can function and grow to the utmost of their capabilities.

(Continued from page 307)

brum of the body. It is needless to say that B.M.R. forms the basis of determining the calorie requirements of an individual under different living conditions. In nutritional disorders and other diseases the estimation of B.M.R. is of great value in deciding the type of diet that is to be prescribed to a patient.