INTENSIVE CARE OF SURGICAL PATIENTS

An Essay

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(M.Sc.)

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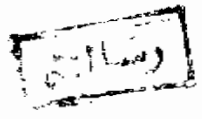

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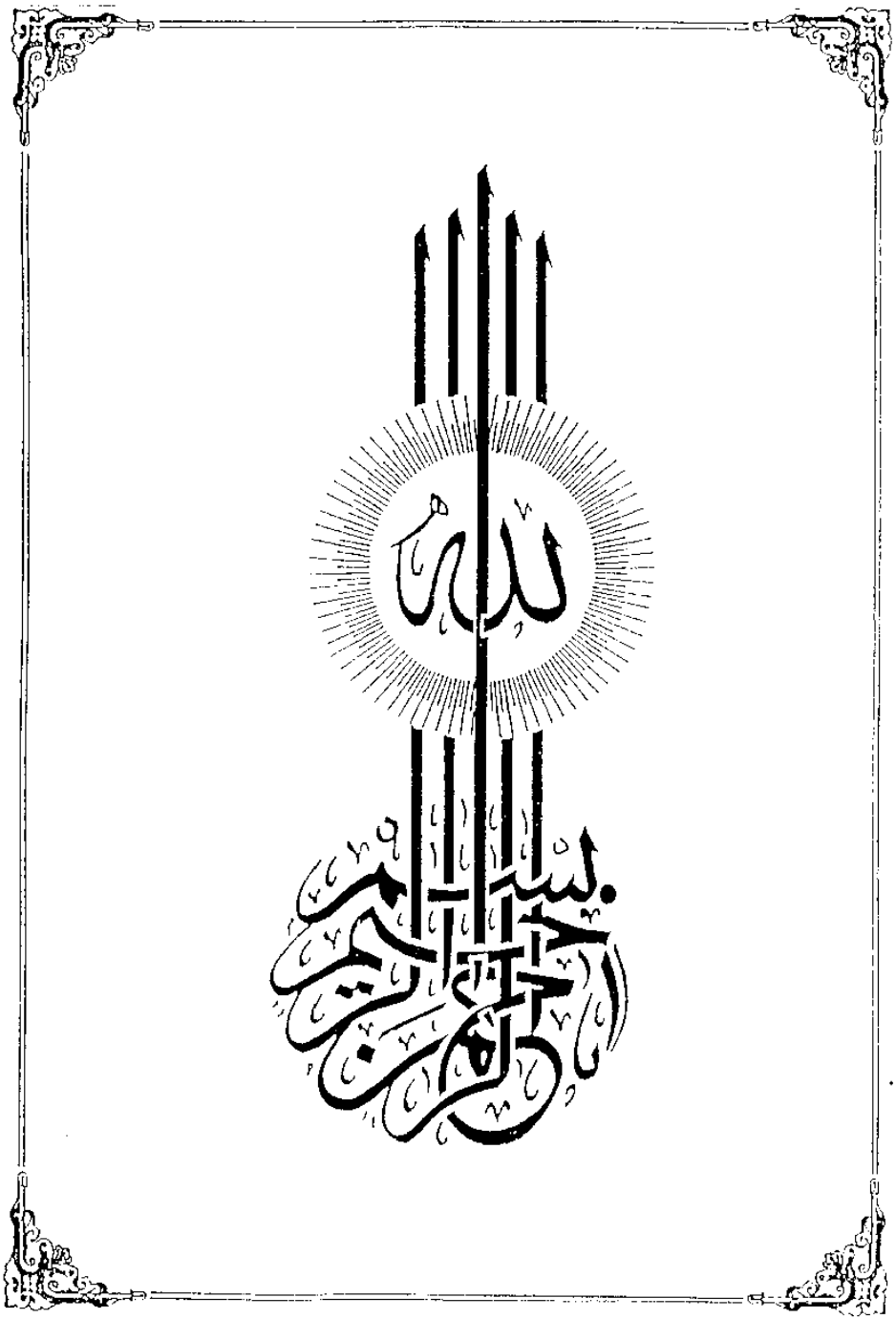

C O N T E N T S

INTRODUCTION

The word intensive implies a concentration of effort. This emphasizes the important point that intensive therapy is not an alternative type of medical care, but merely a concentration of existing techniques of diagnosis, measurements and treatment in the presence of life threatening but potentially curable pathology (Bain and Taylor, 1983).

The objective of the surgical intensive care unit is to provide maximal care for the patient in the most effective and efficient manner possible for optimal results (Schenk and Peters, 1981).

This type of care is not possible in a general hospital unit because of limitations in nurse staffing and training, equipment and supplies (Sikma, 1982).

HISTORY AND DESIGN OF INTENSIVE CARE UNIT (I.C.U.)

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Intensive therapy units have evolved over the past thirty years as the logical result of the concept of "progressive patient care". Even before this label was applied, progressive care was seen in practice in the "Nightingale" wards. These patients requiring most care either as a result of their illness or of necessary therapeutic interventions would be sited nearst to the nurse station (Bain and Taylor, 1983).

Between 1950 and 1970 there was extraordinary rapid growth for approach to therapy that has been called by many names including intensive care and critical care.

Prior to 1950, few general hospitals had an intensive care unit, by 1970 these units had sprouted to the extent that literally every acute hospital had at least one. All bigger hospitals now are likely to have several units, each aimed to a different patient population such as those with coronary disease, burns or trauma (Bendixen and Kinney, 1977).

For many years it has been known that the practical way for application of intensive therapy is by centralization of patients and resources in special

area where great care can be achieved. The examples of earlier centralization of patients for therapeutic purposes are the gas poisoning units of World War I and the shock units of later wars. Also, in the face of civilian disaster, special units were promptly opened so that the patients and resources could be centralized (e.g.) the large treatment units which were created in Copenhagen (1952) due to major outbreak of poliomyelitis. In recent decades we have seen special units open to receive special patient categories (e.g.) burn units and coronary care units.

The first civilian application of special care units for surgical patients was the anaesthetic recovery room. Many surgical intensive care units have been developed as outgrowths or extensions of the recovery rooms (Schenk and Peters, 1981).

Such units for care of surgical patients during the period of immediate recovery from anaesthesia and surgery began to appear sporadically between the World Wars, but their number does not grow until 1950.

Now they are found in every hospital when surgery is performed. The recovery room has gradually changed its role from a relatively quiet room in which patients

slept off their ether, safely on their side and with the head positioned to free the airway, it was envolved into a unit having activity which ranges from checking blood gases and setting respirators to management of circulatory volume and fluid balance (Bendixen and Kinney, 1977).

The concept of the intensive care unit has been so successful that it is difficult today to find a general hospital that does not have one or more of such units.

DESIGN, ORGANIZATION AND EQUIPMENT OF I.C.U.

Intensive care unit should be tailored individually to serve the needs of a hospital. Certain concepts are of sufficient value to form a framework around which an efficient unit may be initiated and maintained (Verner, 1974).

A well designed I.C.U. allows a level of acceptance and efficiency that can never be attained in poorly designed unit. The surgical I.C.U. should be planned with the help of architects and engineers as well as manufacturers of various kinds of equipments (Kinney and Walter, 1977).

Location of I.C.U.:

It is advisable to have the I.C.U. physically adjacent to the emergency admission area and to the operating theatres and recovery room (Telfer, 1983).

Other important features include proximity to the radiological department and laboratory facilities (Schenk and Peters, 1981).

Size of intensive care unit:

The Department of Health and Social Security has recommended that 1% of the beds in a large hospital

should be for intensive care.

A figure of 2-10% of the total number of hospital beds has been described by Skillman and Bushnell (1975).

According to British Medical Association Planning Unit (1967) it is generally accepted that for efficient management in intensive care units the number of beds should not exceed eight beds or maximum ten and that the minimum number should be four. A unit of less than four beds is not practical because of the cost involved in maintaining the large staff that is necessary to run any intensive care unit (Wiklund, 1965). If more than ten beds is required then another unit should be opened (Telfer, 1983).

The patient areas:

The British Medical Association recommendation is for 200-300 ft^2 (18.9 - 28.4 m^2) per bed in the open areas and the Department of Health and Social Security recommends 195 ft^2 (18.5 m^2). These sizes need to include a space of about one meter between the head of the bed and the wall. The minimum distance between bed centres should be 3.6 m. in the open areas. Thus a bed in an I.C.U. requires approximately twice the floor area of a bed in an intermediate care ward.

According to Robertson (1970) and Verner (1974), the beds can either be on an open-plan or in cubicles. The advantage of an open area is easy flexible constant nurse care but has the disadvantage of risk of the noise and cross infection (Saklad, 1964; Skillman and Bushnell, 1975). On the other hand, cubicles can minimize cross infection, it enforces a high nurse/patient ratio at all times. However, the cubicles themselves, can act as source and reservoir of infection if an adequate hygienic routine is not carried out (Beal and Eckenhoff, 1969; Verner, 1974). So, it is better to have a mixture of both in one I.C.U. (Verner, 1974).

Each individual patient care unit should have enough floor space to accomodate for equipment and personnel (Sikma, 1982).

The nursing station:

It should be central, slightly elevated to be able to see all the beds from it. It is the nerve centre of the unit and should accomodate the communications equipment controls for heating, lighting and ventilation. This station should contain a desk, x-ray viewing boxes, storage for radiographs and notes and several seats (Roberts and Edwards, 1975).

The laboratory:

It should occupy about 300 feet^2 (28 m^2) which will greatly facilitate clinical investigations (Verner, 1974). It should be able to perform simple or more urgent biochemical and hematological tests such as blood gases, serum sodium and potassium, blood sugar or packed cell volume (Telfer, 1983).

Other rooms must be available as storage room to keep stock of the disposable routinely used materials as intravenous infusion sets, syringes, needles, catheters, ... etc. Also, a special cleaners room must be present and it should contain special equipment for cleaning.

Two other rooms for the resident doctor and the visitors must be available.

Ventilation:

The unit should be fully air conditioned with no recirculation of air. It should be slightly pressurized with respect to the corridor outside to prevent the ingress of contaminated air from other parts of the hospital (Telfer, 1983).

Lighting:

The whole of the unit should be well illuminated.

Windows should be sited so that all of the patients who are conscious can see the outside world.

As regards artificial lighting, this should require extensive thought. The patient, the nurse and the physician each requires a different level of illumination. Lighting levels required in the bed area range from a fraction of a foot candle for night lighting up to 100 foot candles or more in emergency examination and treatment. Several steps of lighting levels between these extremes are needed for patient use and for routine nursing care. Central lighting should be arranged for appropriate intensity and color tones. Ceiling lighting above each bed should be designed to minimize the glare in a patient's eyes but still provide bright lighting promptly in an emergency (Kinney and Walter, 1977).

Staffing:

Nurse staff:

The nursing care in a surgical intensive care unit should be delivered only by registered professional nurses with special training in critical care.

The nurse-patient ratio must be determined by each individual unit according to the type and acuity

of its patients. Twenty-four hour nursing coverage needs to be relatively equal because critical care requirement do not vary greatly at any time of the day (Sikma, 1982).

The basic principle of one trained nurse per patient at all times is still the ideal to be aimed at but most units can not achieve this at the present time (Telfer, 1983).

Medical staff:

The I.C.U. should be provided with full time resident junior medical staff as well as a senior medical staff which must be under call at any time.

In addition, a skilled technician must be present to be able to take charge of ventilators and other equipment.

The equipments of I.C.U.:

The I.C.U. must have certain available basic types of equipments and the staff must become fully acquanited with their use. Electrical monitoring will never replace close observation by trained nurses and physicians.

These equipments may be classified as those which