

CAPABILITIES OF PARAMEDICAL PERSONNEL

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There is a crisis in medical manpower in the world today, particularly in the developing countries. In 1970, published statistics showed that no fewer than 20 countries had only one doctor for every 20,000 to 75,000 inhabitants. On the other extreme, 42 countries had one doctor for fewer than 1,000 inhabitants. Some of these countries consider their needs are not fully met. Russia, for example, aims to reach a ratio of one doctor to 300 inhabitants (Khoo, 1974).

In 1965, WHO laid down a minimum target for the next decade of one doctor for every 10,000 of the population. Throughout Africa (excluding Egypt and South Africa), the average doctor/patient ratio was then 1:20,000. To meet the target, an increase of 14,000 doctors, from 10,000 to 24,000, was needed immediately. This was roughly equivalent to the complete 10-year output from all the medical schools in Britain, concluded Professor Hill (1972). He went on to point out that in East Africa out of 1,000 children attending primary schools, only 10 go to secondary schools and only one continues training thereafter. Other equally important disciplines such as agriculture, engineering and education compete for such students eligible for university places. Northern Nigeria requires 17 times as many doctors to look after its 20 million people, i.e. 3,000 instead of the present number of 125. In 1965, it had no medical school; the first 30 doctors from the new medical school in Zaire were to qualify only in 1973. At this rate, it would need 100 years to provide the 3,000 trained doctors but by AD 2000 the population is expected to double.

It has been estimated that the world needs 750 new medical schools and 75,000 teachers. If there is to be one doctor for every 770 people as in Europe, then the world is 3.5 million doctors short. Medical colleges in India have increased from 30 in 1900 to 92 in 1969, increasing the student intake from 2,600 to 11,000. In the attempt to meet the demand rapidly, quality invariably suffers; the product would be somewhat better than a medical assistant but at what cost?

The rapid social and economic developments in many countries make severe demands on the doctor as he has to function in an increasing number of roles that cover a wide range—from general practitioner, specialist, environmentalologist, preventive and social medicine expert to hospital administrator. The truth is that the doctor can no longer cope with these multitudinous needs, with the result that the health care of the community suffers. There are simply not enough university trained doctors for these tasks. This dilemma of providing a highly trained physician on the one hand and meeting the needs of the country on the other constitutes a crisis that can only be solved by producing a greater number of medical assistants, variously called health extension officers in Papua New Guinea, physician assistant or medex in the USA, feldsher in USSR. He is neither physician nor nurse. With 8 to 9 years of basic general education followed by two to three years of technical training in inexpensive schools associated with health centres rather than Flexner-type teaching institutions, he is the key to the promotion of community health. His role includes the diagnosis and treatment of the

common diseases, preventive medicine, environmental sanitation, rehabilitation and the referral of more complicated problems to the present health centre.

The uneven distribution of doctors between big cities and the rural areas where they are most needed is a major problem in developing countries.

In 1970 it was estimated that 71% or 2.5 billion of the estimated 3.5 billion world population live in rural areas or in small towns of less than 20,000 inhabitants. Of those 2.5 billion, two billion live in the less developed regions.

Frontline health personnel have the first contact with the population to provide primary health care to the individual and community. In developing countries this basic health care is in the hands of the auxiliary personnel (Flahault, 1973).

The WHO defines a medical auxiliary as a 'technical worker in a certain field with less than the full professional qualification'. He or she is a substitute, an alternative rather than a complement.

The two obstacles to better health care are:

- (1) lack of money
- (2) lack of skilled manpower

The high cost of professional training, the shortage of places for medical students and the increasing cost and sophistication of medicine militate against an adequate output of doctors particularly in developing countries. Even in the affluent West, physician assistant programmes have been necessary to train assistants to extend or augment the work of physicians in a number of areas.

The cost of training an auxiliary is considerably less than that of a doctor. In Uganda, it costs US\$1,780 for a 3-year auxiliary training as against US\$23,000 for a doctor. (In U.K., it costs US\$35,000 and USA,

US\$52,300 to train a doctor, respectively). Therefore the costs of training medical assistants is usually 5-10% of the cost of training doctors but they are worth a great deal more than 5-10% of a doctor in health care delivery.

Hence the solution is to employ an intermediate technology using people with different degrees of skill for the different physical resources at existing economic levels. This labour intensive approach splits the final product into various parts each of which can be supplied by someone with a special but limited skill and whose training is much less expensive than that of an operator with a multitude of varying talents. However, the gap between the physician and the medical auxiliary should be wide enough to be easily distinguishable.

In developing countries the medical auxiliary has to deal with just as wide a range of health problems as any physician but he is better prepared in more routine areas of health care, preventive medicine, maternity and child welfare, environmental health and health education.

Such a programme must evolve ecologically, planned by people who understand the local conditions.

The capabilities of a medical auxiliary should include:

The care of the sick whenever necessary in local conditions e.g. in the community at a health centre or hospital.

Either treatment of the sick himself or the referral to someone more skilled. The medical auxiliary must know enough to judge how urgent is the need for referral.

Access to and provision of solutions for the community's problems and needs, making the best use of limited resources.

Understanding the value of and being able to undertake health education with

the aim of improving the health of the community and not merely treating the sick.

Openness to the local situation eg. while receptive to new ideas he should not reject all traditions.

Understanding how his role relates to the physicians.

Qualifications

Horn (1969) writes of his experience in China that the qualifications of the medical auxiliaries are simple:

1. Middle school education.
2. Average intelligence.
3. A strong vocational urge.

At Duke University Medical School (Elliot, 1972) where the medical assistants are trained either for highly specialised skills, e.g. in renal dialysis, or for broad general skills for family general practice the qualifications are:-

1. High school education, i.e., 10-12 years schooling.
2. Personal recommendation.
3. Good results in intelligence and personality tests.
4. Previous experience in patient care, eg., as a medical corpsman in military service or practical nurse training.
5. Personal interview.

Perhaps there is not such a difference in selection after all.

The training programme of auxiliaries must necessarily take into account the lower level of basic education and the shorter training period.

The basic premise is that the trained auxiliary need not be able to make a specific diagnosis but must be able to identify an illness and know sufficiently how to manage it.

The patient's problems can be grouped in patterns so that the auxiliary chooses the pattern that fits the problem from the history, physical examination and simple laboratory tests necessary to confirm the choice. Likewise he chooses from patterns of management of disease having only a basic knowledge of anatomy, physiology and pathology to fit together with the skills and attitude he uses in dealing with the sick person. In other words, he treats symptoms rather than disease.

Thus in the syndrome of gastrointestinal infection presenting as diarrhoea, vomiting, abdominal pain, fever and dehydration, he will require a pattern of management to rectify fluid loss and sedate the overactive digestive tract. He will however have to differentiate a worm infestation from an acute abdominal emergency.

In North Carolina, USA, the physician assistant is in many ways a junior resident. He does not make a diagnosis, write prescriptions, initiate treatment. He takes histories, makes a physical examination and carries out routine procedures, eg., venepuncture or intubation. He supervises tests and presents patient's case to the physician.

The Duke University scheme begins with a preliminary 9 months academic basic science course with some introduction to clinical medicine. Organ orientated teaching is combined with laboratory work and clinical procedures. In the last 6 weeks, physical diagnosis, community health and specialised procedures such as ECG, X-rays and data processing are taught. The clinical rotation of 4 periods of 8 weeks each takes place in controlled surroundings in hospital or medical centre in defined areas of medical care. Here students learn to apply information already learnt and are taught additional special skills, rotating between inpatient as ward work and outpatient work, community health work and lastly public health units, insurance agencies and voluntary health

agencies. The rest of the 2-year course is spent in special training depending on the trainee's interest in cardiology, paediatrics, neurology, general surgery, etc.

The University of Colorado supplements the lack of paediatricians by recruiting graduate nurses who undergo a four months intensive course in the theory and practice of paediatrics. They can give almost complete well-child care, evaluate and manage many acute and chronic disorders, coping with 70% of cases unaided, only referring one case in four to the paediatrician whose potential is thereby increased by one-third (Elliott, 1972).

How much of a hospital's work could be done by paramedical workers?

An analysis by Dr. Helen Gideon (1973) of 1,032 out-patients and 681 in-patients from 8 mission hospitals in 6 states in India in 1973 showed that 48% of out-patients and 44% of in-patients would probably not have needed to come to the hospital if they had been treated or advised earlier by a paramedical worker. This was particularly true of the under-fives in-patients of which 67% were considered preventable admissions.

In low production, physically deprived countries, the use of responsible, even illiterate, members of the community as paramedical workers has proved successful.

In Chimaltenango, Guatemala, Dr. Carroll Behrhorst (1974) trains responsible Indians to recognise common problems in their countries. These trainees were initially recommended by Peace Corps volunteers but latterly by local priests and community committees. The once-a-week training is continuous. The training consists of ward rounds and patient demonstrations and the teaching is problem-oriented, always in the context of the village background. Diarrhoea and pneumonia comprise more than 75% of

the patients' visits to clinic and hospital. Trainees are trained to identify and treat the majority of diseases in the villages and to recognise disease that cannot be treated and which must be referred to the professional. The staff do not talk of disease but rather of the patients' symptoms. After a year's training, the trainee is allowed to dispense medicine and give injections.

The assessment is by monthly examination in which the student describes what he sees in a patient, what is to be done for the problems and what must be done in the patient's home to prevent recurrence of the problem.

Supervision is by weekly visits in the village of professionals who could be a doctor or an extension nurse. The University of Kentucky has a programme of assessment of the students for effectiveness of work, reliability, acceptance and the place of the programme in the entire scheme of the community. Dr. Michael Murphy of the University of Kentucky found the percentage of errors in treatment low and 91% of patients were treated correctly (Behrhorst, 1974).

The effectiveness of the 80 trained paramedical personnel in a population of 180,000 with a high disease rate was entirely gratifying. Twenty to 20,000 patients were treated. Vaccination programmes, TB control and treatment, family planning, agricultural extension programmes and a list of community projects were implemented (Behrhorst, 1974).

Browne (1973) gave a fascinating account of the training of medical auxiliaries in the former Belgium Congo. The training programme for infirmier (or male nurse) took 3 years. Infirmier diplomates were granted official diplomas after 2 years work and refresher courses. Besides recognising common conditions, they performed minor operations and were involved in medical

census visits, investigations and research programmes for yaws, onchocerciasis, leprosy and sleeping sickness and helped in the control of endemic disease in a district of 10,000 square miles. In the 3 years instruction, weekly tests were held in French.

China today has perhaps the most comprehensive health care delivery among the nations. In 1944, there were only 12,000 western-style doctors but today there are 180,000. However, the health delivery is carried out by a vast army of 172,000 assistant doctors, 186,000 nurses, 42,000 midwives, 500,000 practitioners of traditional medicine and 1,000,000 part-time auxiliaries besides the western-style doctors. Health care in China is a political question. The urban medical care organisation starts at the level of factory and street and care health stations and progresses up to the teaching hospital. The rural health care is conducted from the country hospital at the highest level successively down to the commune hospital serving 10,000-60,000 people, to the Brigade Health Station serving 2,000-5,000 people and finally to the Production Team Health Station serving 260-700 people. It is in the last two categories that the auxiliaries including barefoot doctors come into the picture.

By placing high priority on controlling diseases, e.g., improvement in environmental sanitation, widespread health education programmes, inoculation and a highly effective preventive network, the threat of communicable disease has been contained practically eliminating cholera, small pox, typhoid, typhus, syphilis and gonorrhoea.

Since 1949, medical auxiliaries have been recruited and trained. Between 1950 and 1966, these auxiliaries were of 3 types: (i) the specialist, the equivalent of the feldsher or assistant doctor, who was trained for 1-2 years in one specific field, (ii) the paramedical

professional such as the nurse and laboratory technician with 2-3 years study in appropriate institutions, (iii) the hygiene worker with 3-6 months training in environmental problems and disease control. At the beginning of the cultural revolution in 1966 after Mao had issued his June 26 (1965) directive in health 'to place stress on the countryside', peasant or barefoot doctors made their appearance. They spend part of their time in agricultural labour and the rest in health care work.

They are chosen for their intelligence (having had at least junior middle school education), keenness to become doctors and an unselfish attitude. The first four months are spent learning simple anatomy and how to recognise symptoms and causes of common diseases and their treatment by traditional and western practices. After the initial 4 months training they return home with a box of simple medical supplies to treat the local peasants. During the next agricultural slack season they go for another 4 month course and thereafter spend sometime in a modern hospital with advanced facilities. At the end of 10 months, the students can recognise 75 common diseases and 160 acupuncture points. The training period of part-work part-study lasts for 3 years. Students work in agricultural production until they are needed to treat a case. They refer the complicated case to the nearest clinic or contact the nearest mobile medical team by telephone to obtain advice. Their work includes a heavy content of birth control work, vaccination and environmental sanitation. They direct campaigns against pests, see that people attend health centres for examinations, train subordinate medical personnel with even more limited duties. They receive no extra salary for their effort, being paid at the same work point scale as for their other work. Their urban counterparts are called 'worker doctors' and 'Red Guard' doctors whose tasks parallel theirs

except that they are also responsible for industrial health. The Red Guard doctor is usually a housewife with less training than the other types. They are addressed as 'comrade', the term doctor being reserved for those with higher education. They are supervised by more highly trained medical people (Christian Medical Commission, 1974).

It is therefore clear that auxiliaries or monitors could reduce as much as half the hospital work load. Re-organisation of the medical services to include them will (i) increase the potential of the doctor and specialist and avoid wastage or unessential services, (ii) save hospital costs in beds, drugs and staff time, (iii) develop responsible paramedical staff, (iv) save great numbers of people as personnel will have more time and funds are made available, (v) avoid family disruptions caused by preventable admissions, (vi) save time spent as outpatient for patients to earn their livelihood.

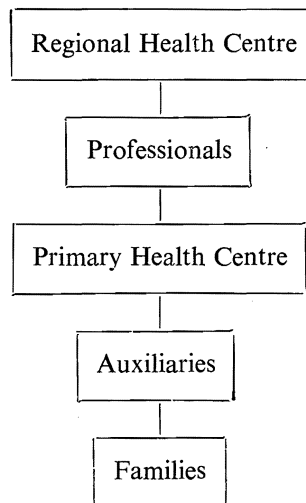
To meet the problems in developing countries, certain principles of training and service of the medical auxiliary can be arrived at according to the experience of Rosa (1964). The design of auxiliary training should include the following objectives:-

1. Orientation towards the practice of preventive medicine and public health at the community level, i.e., development of health services within limits which the people can support locally.
2. Training in the instruction and leadership of auxiliary workers, e.g. nurses, laboratory technicians, and sanitarians who are literate with some degree of formal training. With modern tools, a brief training can lead to a greater reduction in sickness than the best doctor could achieve 25 years ago.
3. Instruction in handling mass campaigns, e.g., against small pox, TB, syphilis,

trachoma, and promoting at the same time a widespread health education programme.

4. Development of community self-help programmes, e.g., better water supplies and improved drainage.
5. Knowledge of maternity and child health needs. In any developing country, a large proportion of the population will be children and improvement of nutritional standards, widespread immunization against communicable diseases and instruction in methods of family planning are vital.
6. A sympathetic appreciation of local culture and resources. Effective medication should be as far as possible cheap and simple, practicable and suitable for use in the field and clinic rather than in the hospital.

The concept of a regional health centre at the apex of a system staffed by professionals, has a base of health monitors from the community comprising persons such as teachers, and policemen who monitor the health of families and refer cases to the Primary Health Centre staffed by auxiliaries.



As Rene Dubos has said, "The real measure of health is not the Utopian absence of disease

but the ability to function effectively within a given environment”.

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