DOCUMENT RESUME

ED 023 394 JC 680 396

Extending Campus Resources.
American Association of Junior Colleges, Washington, D.C.
Pub Date 68
Note-26p.
Available from-American Association of Junior Colleges, 1315 Sixteenth Street, N.W., Washington, D.C. 20036 ($0.75).
EDRS Price MF-$0.25 HC-$1.40
Descriptors-*Health Occupations Education, *Junior Colleges, *Laboratory Technology, Subprofessionals, *Technical Education, Training Laboratories, *Vocational Education

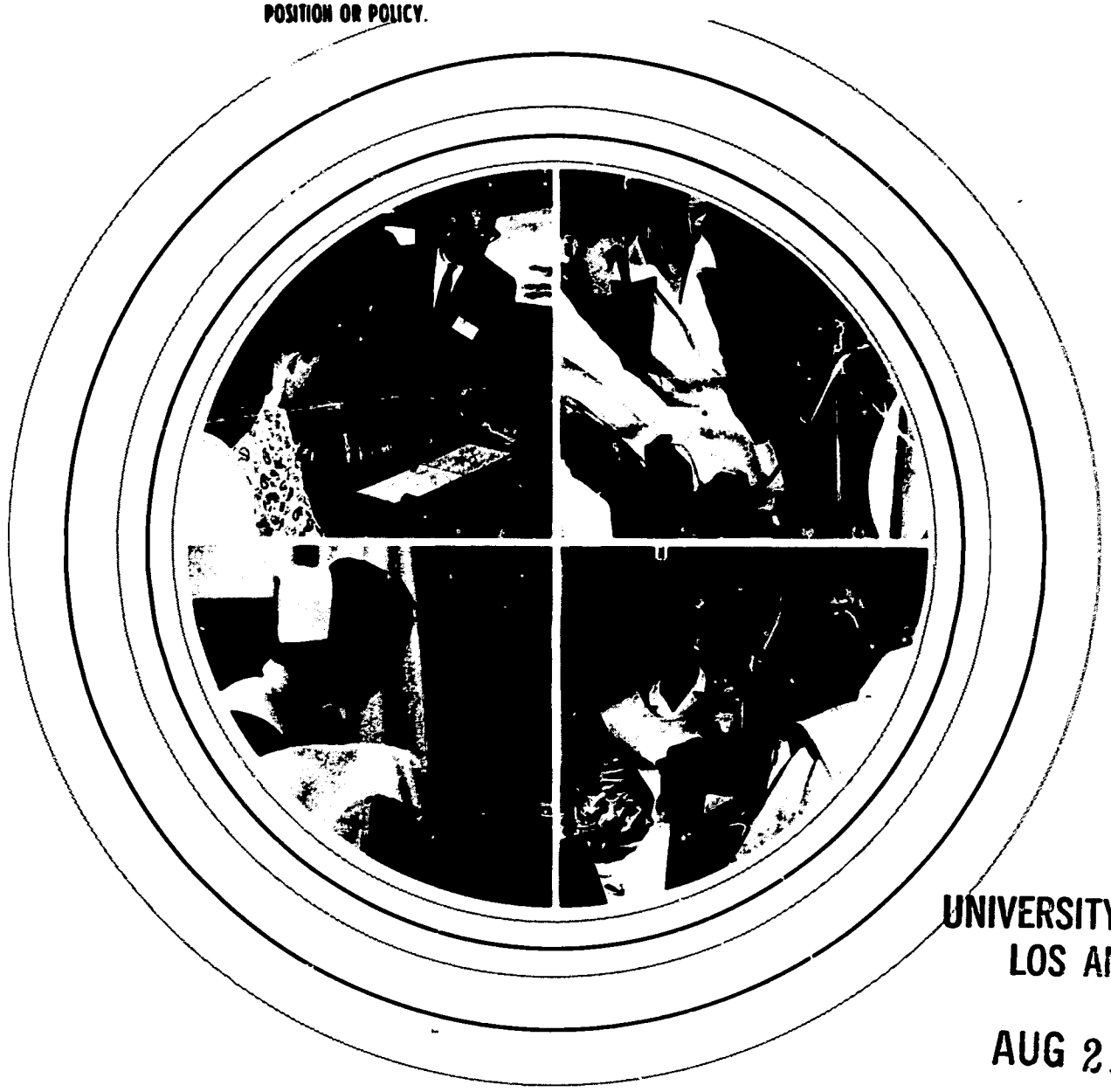
In selecting clinical facilities for health technology programs, many points must be considered, since competence in this field cannot be achieved without clinical experience. This guide describes (1) the important differences between clinical practice and work-study programs, (2) the selection of off-campus facilities, predicated on a thorough analysis of the program's needs versus the feasibility of on-campus simulation of a service environment, (3) the establishment of rapport between clinic and college personnel, with agreement on the goals of the program, (4) the number and kind of clinical facilities needed for the different courses, (5) the need for keeping up with the rapid changes in the field, (6) an outline of responsibilities for instruction, supervision, and evaluation, and (7) contractual agreements to clarify the shared and separate roles and responsibilities of clinic and college personnel. The guide comments on professional standards (both existing and required) and lists possible laboratory extension resources, such as hospitals, clinics, health centers, nursery schools, nurseries, physicians' and dentists' offices, rehabilitation centers, long-term care agencies, sanitation departments, biological laboratories, and ambulance services. Minimum requirements for all programs are locker space, dressing rooms, work and conference space for instructors, library and reference materials, and eating facilities. The guide also lists available printed materials for use in planning these programs. (HH)

EXTENDING CAMPUS RESOURCES

A GUIDE TO USING AND SELECTING CLINICAL FACILITIES FOR HEALTH TECHNOLOGY PROGRAMS

EXTENDING CAMPUS RESOURCES

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION



GUIDE TO USING AND SELECTING CLINICAL FACILITIES FOR HEALTH TECHNOLOGY PROGRAMS

Price: 75 cents

1315 Sixteenth Street, N.W.
Washington, D.C. 20036
Printed in U.S.A.

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FOREWORD

During the time that the New York State Associate Degree Nursing Project was in operation under the direction of Robert E. Kinsinger, a booklet was published entitled *A Guide to the Selection of Clinical Facilities for an Associate Degree Nursing Program.* Issued by the State Education Department, Albany, the guide was developed as an aid to college personnel in selecting appropriate educational settings for nursing students. So widespread was the use of the guide that it was reprinted in 1966, and within a very short time, again, most of the copies had been distributed.

With the rapid development and implementation of allied health and medical programs in the community junior colleges, a need was emerging for a similar guide helpful in all areas of allied health and medical education programs requiring extended campus resources or clinical facilities. As this growing need was identified by those working in the Occupational Education Project of the American Association of Junior Colleges, permission was obtained from the State Education Department in Albany to revise and modify the earlier guide so that it could be more widely used and distributed among the nation's community junior colleges seeking information concerning the wise and effective use of extended campus resources.

K. G. Skaggs, staff specialist in allied health and paramedical education for the American Association of Junior Colleges, formed an editorial advisory committee to assist in the rewriting of the guide. The following persons served on this committee: Edith Belsjoe, personnel director, St. Vincent's Hospital, New York; Sister Anne Joachim, C.S.J., president, St. Mary's Junior College, Minneapolis; Ralph L. Watt, director of education, Hospital Continuing Education Project, American Hospital Association, Chicago; Phyliss McEnerney, Allied Medical Development Project, Forest Park Community College, St. Louis; Sidney Lewine, director, Mt. Sinai Hospital, Cleveland; Dr. Kinsinger, now director of the Division of Education and Public Affairs, W. K. Kellogg Foundation, Battle Creek; Frank Kille, director, Office of Science and Technology, State Education Department, Albany; and John C. Briscoe, Office of Science and Technology, State Education Department, Albany. Muriel Ratner, director, Health Technologies Teacher Preparation Center of The City University of New York, was asked to write the new guide. This publication is the result of the work of Miss Ratner and the committee.

The current issue of the guide is one of the publications of the Occupational Education Project of the American Association of Junior Colleges, a project supported by the W. K. Kellogg Foundation. The Association expresses its appreciation and thanks to all those who have worked in getting this publication ready for distribution, to Mr. Briscoe and Dr. Kille of the State Department of Education in Albany, to Dr. Kinsinger of the W. K. Kellogg Foundation, to the other members of the editorial advisory committee, and to Miss Ratner, the editor and writer of the publication.

Kenneth G. Skaggs, Coordinator
AAJC Occupational Education Project

INTRODUCTION

This is another in a series of guides published by the American Association of Junior Colleges to assist college personnel in the planning and development of health technology programs. *Extending Campus Resources* is designed to facilitate the task of selecting clinical facilities appropriate to and consistent with the objectives and philosophies of the health technology curriculums being developed. Its use is predicated on the assumptions that colleges will have:

a. Already assessed and established the feasibility of developing one or a variety of health career programs.

b. Employed qualified faculty to assume the major responsibility for developing the curriculums, and, if necessary, engaged specialists to serve as consultants.

c. Organized an occupational advisory committee for the particular technical program, or appointed occupational specialists to existing committees.

Extending Campus Resources contains a number of references which allude to the foregoing assumptions. The following Association publications are useful adjuncts to those references:

A Guide for Health Technology Program Planning, 1967
On Using and Being a Consultant, 1967
The Role of the Advisory Committee in Occupational Education in the Junior College, 1967

EXTENDED CAMPUSES

Two-year colleges are developing increasing numbers and varieties of programs to educate and train health service technicians.

Several characteristics of the health services field require somewhat unusual (for colleges) curriculum patterns. Most noteworthy is the use of facilities and agencies beyond the immediate college campus for student skills development and practice. These are frequently referred to as "extended campuses."

Health Technology Programs For Two-Year Colleges

Dental Hygiene
Dental Assisting
X-ray Technology
Nursing
Occupational Therapy Assisting
Inhalation Therapy Technology
Medical Record Technology
Mental Health Assisting
Community Health Assisting
Ophthalmic Dispensing (Opticianry)
Operating Room Technology
Biomedical Engineering Technology
Environmental Health Technology
Physical Therapy Assisting
Medical Emergency Technology
Radiological Health Technology
Orthotic Technology
Prosthetic Technology
Orthoptic Technology
Dental Laboratory Technology

While it is possible for colleges to build and completely equip facsimile health service environments (e.g. nursing laboratories, x-ray laboratories), colleges cannot supply the ultimate feature that distinguishes the health-related technologies from all other technical fields. The direct recipients of health services are *people* who require one or a combination of the following kinds of care:

1. Preventive — in well-baby clinics, dental offices, diagnostic centers, prenatal care programs, etc.
2. Therapeutic — in general hospitals, physicians' offices, emergency first-aid stations, etc.
3. Rehabilitative — in special service agencies such as physical rehabilitation centers, geriatric agencies, schools for the deaf and/or blind, mental health facilities, long-term or convalescent care centers, etc.

Health technician students could learn a great deal, and could achieve a high degree of manipulative skill in their technical specialties within college classrooms and laboratories, but success as health service practitioners is contingent upon their ability and skill in applying their learning in real (clinical) situations. For this reason, health technology curriculum development includes planning for the use of clinical facilities in which a substantial portion of instructional and learning activities takes place. Indeed, preservice clinical practice is considered so essential in most health service education that it is actually stipulated either by state licensing laws or by educational standards established by national, regional, or local professional associations.

CLINICAL PRACTICE VERSUS WORK-STUDY COOPERATIVE EDUCATION

It is useful at this point to distinguish between clinical practice and work-study experiences. While they are similar, in terms of learning benefits accruing to students, there are two important differences.

1. Clinical practice is directly related to, and takes place within, the technical specialty for which students are preparing. The experience complements on-campus learning. It is, moreover, a requirement for graduation from most health technology programs.

Work-study programs, on the other hand, need not be directly related to the technical field for which students are preparing, although there are indications that such programs will more closely correlate students' work experiences with their educational programs. However, work experiences are generally not a requirement for graduation from a program. They are provided to supplement on-campus learnings.

2. Students engaged in clinical practice cannot be remunerated for services performed. A major reason for this is the existence of licensing laws governing the practice of many health technicians. The acceptance of money by a student health technician for services in the specialty for which he is preparing is tantamount to practicing without a license which, in turn, constitutes a violation of the law.

Students in work-study programs are permitted to accept wages or salaries for services they render. Cooperative education work experience programs are an outgrowth of earlier plans designed for young people who needed to earn money to complete their schooling.

This subject was introduced merely to explain the essential differences between clinical practice and work-study experiences and not to argue the merits and/or the wisdom of the distinctions. No regulations prevent health technology students from earning income during the course of their studies. They simply cannot be "paid" to function in the same occupational category for which they are preparing to become licensed.

HOW TO USE THIS GUIDE

Since no two colleges, communities, health technologies, or clinical agencies are alike, this guide cannot possibly delineate a precise model for selecting and using extended campus resources. It can, and does, outline some general considerations and procedures for facilitating the task. Each college must analyze its own needs within the framework of its own particular setting. Imagination and inventiveness will enable some colleges to create excellent career program opportunities in situations devoid of elaborate resources, while other colleges may fail to capitalize on their potential in the midst of ample assets.

The guide suggests an approach to developing meaningful health technology clinical practicums, but permits sufficient flexibility for alternative action.

The following chapters are organized into five phases comprising the major sequential steps in the process of selecting and using clinical

resources. Succeeding phases are dependent upon the successful dispatch of each preceding step, much as the initiation of the first step depends upon the college's satisfying itself that it is within its capabilities to engage in health technology education at all.

Phase I is a general discussion on factors to consider in determining the need for clinical facilities.

Phase II discusses the kinds of relationships that a collaborative educational endeavor requires, and seeks to examine the major issue affecting the selection of agencies.

Phase III enumerates the clinical agency conditions and services required by health technology programs for students and faculty.

Phase IV discusses each participant's responsibility for supervision, instruction, and evaluation of students while they are in the extended campus facility.

Phase V stresses the importance of a written agreement or contract to which representatives of the college and clinical agency are cosignatories.

DETERMINING THE NEED FOR CLINICAL PRACTICE FACILITIES

The extent to which the need for clinical practice facilities becomes critical to the success of the health technology program depends largely on two related determinants: an analysis of the technical aspects of the curriculum as a basis for understanding how much extended campus activities will be required; and an assessment of the resources the college can provide to meet those needs.

Analysis of the Program

All health services require some degree of contact with the recipients (patients) of the services. This may range qualitatively and quantitatively — from a great deal of direct personal contact as in nursing, to very little patient contact as in medical record technology.

In addition, all health services involve the use of some special machinery or equipment requiring some measure of manipulative skill and dexterity. Inhalation therapy and biomedical engineering technologies are concerned with whole galaxies of complex and sophisticated machinery, while fields such as community and mental health services may require skills in using more familiar instruments such as typewriters, clinical thermometers, and the like.

Degree of patient contact and the kinds of skills to be developed in each technical specialty are important facts to have from the point of view of knowing *when* they occur in the course of the program. Generally speaking, x-ray technicians, inhalation therapy technicians, medical laboratory technicians, operating room technicians, ophthalmic dispensers, etc., cannot function in these capacities until they have thoroughly mastered both the knowledge and the skill in the use of the equipment and instruments associated with their specialties. Skills development necessarily precedes patient-contact activities;

hence, clinical practice experiences in such specialty fields can be planned *sequential* to skills development in the college laboratory. On the other hand, nurses, mental health assistants, community health workers, and dental hygienists, can often master the tools of their trade, so to speak, *concurrent* with clinical practice activities.

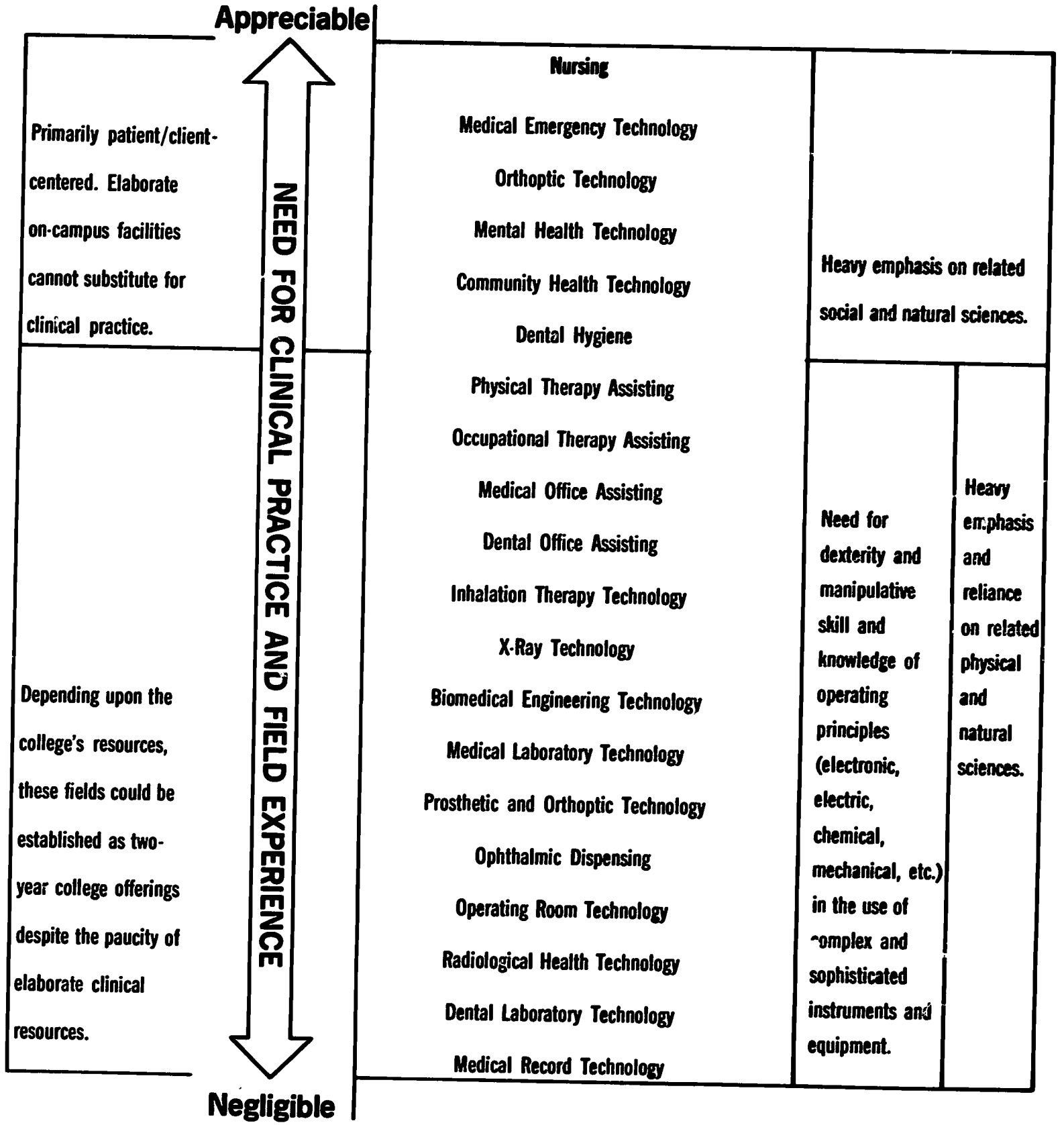
In short, the "service" rendered through some health technologies is predicated on a process involving instrumentation: e.g. x-ray, inhalation therapy, occupational therapy, ophthalmic dispensing. The use of instruments and equipment in health occupations such as nursing, community health, mental health, etc., is essential, but as incidental aids rather than as fundamental reasons for providing such services. In view of this, there will be varying degrees of need for clinical facilities. Some programs will require the use of extended campus resources very early and throughout the entire length of the program (e.g. nursing); others, however, might delay using clinical facilities until a much later stage, and for limited periods of time (e.g. medical record technology).

Assessment of College Resources

Having completed preliminary analyses of the nature of its health technology programs, the college should assess its own resources for developing on-campus facilities. Factors to consider in this are: 1) budget (capital and operational expenditures); 2) laboratory utilization rate; 3) space; 4) geographic setting of the college.

1. *Budget:* The cost of equipping on-campus laboratories varies considerably from one health technology to another. The figures in the chart below are cost estimates for nine programs.* The figures are based on enrollments of thirty students for the first year and a similar number in the second year.**
   a) *X-ray technology*—$43,000—This includes two fully operative x-ray units and two darkrooms, lead shielding for walls, and a variety of phantoms (plastic skeleton and anatomical parts.)
   b) *Ophthalmic dispensing*—$138,000—This includes lens grinders, edgers, work benches, small tools, surfacers, cutters, assorted lenses, lens hardening units, a generator, etc. (Heavy-duty flooring is a prerequisite for much of this equipment.)
   c) *Occupational therapy assisting*—$17,700—This includes ceramic and enameling kilns, textile looms, drill press and sander, jigsaw, sewing machines, gem cutting and lapidary equipment, potter wheels, small tools, etc.
   d) *Medical record technology*—$9,000—This includes typewriters, transcription equipment, adding machines, file sets and guides, and duplication equipment and supplies.

*These are the nine programs developed under the New York State Education Department's Community College Health Careers Project of 1964-67.
**These are based on retail prices as quoted in 1966-67 catalogs.


Appreciable
NEED FOR CLINICAL PRACTICE AND FIELD EXPERIENCE
Negligible
Primarily patient/client-centered. Elaborate on-campus facilities cannot substitute for clinical practice.
Depending upon the college's resources, these fields could be established as two-year college offerings despite the paucity of elaborate clinical resources.
Nursing
Medical Emergency Technology
Orthoptic Technology
Mental Health Technology
Community Health Technology
Dental Hygiene
Physical Therapy Assisting
Occupational Therapy Assisting
Medical Office Assisting
Dental Office Assisting
Inhalation Therapy Technology
X-Ray Technology
Biomedical Engineering Technology
Medical Laboratory Technology
Prosthetic and Orthoptic Technology
Ophthalmic Dispensing
Operating Room Technology
Radiological Health Technology
Dental Laboratory Technology
Medical Record Technology
Heavy emphasis on related social and natural sciences.
Need for dexterity and manipulative skill and knowledge of operating principles (electronic, electric, chemical, mechanical, etc.) in the use of complex and sophisticated instruments and equipment.
Heavy emphasis and reliance on related physical and natural sciences.

e) *Biomedical engineering technology*—$46,000 — This includes myographs, a physiograph main frame, cardiac preamplifiers, rectilinear and curvilinear recording channels, computer with analog-digital converter, oscilloscopes, spirometer, gas analyzers, etc.

f) *Operating room technology*—$17,500— This includes basic instrument sets, Mayo stands, kickbuckets, suction machine, stretcher, cautery instruments, major and minor surgery linen packs, operating room scrub supplies and linens, etc.

g) *Medical emergency technology*—$4,000 — This includes resuscitators, Resusci-Dolls (infant and adult), variety of splints, obstetric kit, blankets, air-ways, fire extinguishers, acetylene torch, oxygen equipment, etc.

h) *Environmental health technology*—$45,000 — This includes equipment for geology and limnology courses, equipment for field and laboratory sampling, and for analytical work stations.

i) *Inhalation therapy technology*—$43,000 — This includes incubators, resuscitators, suction apparatus, humidifiers, air compressor, oxygen tent, hygrometers, gas analyzers, spirometer, repair kits, small tools, etc.

While the figures cited above include the cost of some expendable supplies, they closely approximate the necessary capital expenditures for equipping basic and adequate laboratories. The per student operational costs have been estimated to range from $1,200 to $1,400 per annum.

2. *Laboratory utilization rate:* Some colleges may have to justify capital expenditures for laboratories on the basis of a prescribed or advised utilization rate. Again, the nature of the program would, in part, govern this rate. For some programs (ophthalmic dispensing, medical record technology), the better equipped the on-campus laboratory, the higher the utilization rate. It can also be said that the availability of well equipped on-campus laboratories reduces the urgency of finding clinical resources — *for some programs.*

Since the learning experiences of students in programs such as nursing, dental hygiene, and community and mental health technology are primarily patient centered, the presence of elaborate on-campus laboratories does not take the place of practice in a clinical setting.

One major advantage in centering health technology programs in community colleges is that it permits larger student enrollments. (Hospital sponsored programs are often constrained to limit enrollments in accordance with the size and activeness of their specific service departments.)

An adequately equipped on-campus laboratory might enable the college to

increase its enrollment in many health career programs despite limited extended campus resources. This would apply particularly to specialties in which clinical practice does not constitute the priority condition for learning.

3. *Space and utilities:* Since it will be necessary to install some equipment and machinery in fixed and bolted positions (ophthalmic dispensing, dental laboratory technology), the college must be prepared to allocate a relatively permanent site for these laboratories. In addition, some programs require special electrical wiring, gas, and water systems. (These items are not included in the estimated budgets cited earlier.)

   Other programs (inhalation therapy, biomedical engineering technology) often use equipment mounted on casters which may require substantial storage space when not in use. "Laboratories" for such programs may then be converted for other uses as needed.

4. *Geographic setting of the college:* Two-year colleges are frequently located far from complexes of health service facilities. However, this does not preclude a college's responsibility to offer health technology programs if (a) feasibility studies and surveys warrant them; and (b) student interest in such programs is sufficiently high. These last two items represent crucial variables upon which a college may well justify outlays of seemingly large capital expenditures and allocations of apparently underutilized laboratory and classroom space.

The foregoing analyses should be helpful in revealing the essential reasons for seeking and using clinical facilities. Although the educational philosophies and objectives toward which the specialized health technology programs aim should be fairly standard throughout the nation, the specific methods and procedures used to achieve them may differ. These latter are contingent upon the kinds of resources available to and within the individual colleges and their communities.

ESTABLISHING RELATIONSHIPS

Program feasibility surveys and studies will have required the establishment of communications among a variety of people: clinical agency administrators, practitioners, and college personnel. But the established communications need not have been on a level between the college curriculum developers and the clinical agency service department personnel.

Obviously, someone in the clinical agency will have ultimate responsibility for making the decision to cooperate with the college in the use of the facilities, but this is not necessarily the individual with whom the college initiates its discussions. Moreover, the college cannot assume that the "decision maker," as the first contactee, can guarantee that the line staff will accept the college program. There is no hard and fast "method" in establishing the necessary relationships required by a collaborative educational endeavor.

It is not unusual for a college to be

encouraged by hospital administrators to engage in health technician education. When this happens the college cannot be sure that administrators have previously conferred with, or secured the interest and potential cooperation of their service department staff — within whose purviews college students would eventually function. Failure to alert department personnel that the hospital is planning to collaborate with a college in the education of technicians could seriously hamper the college when it is ready to plan details in the use of the hospital facilities. Should this have been the case, the college would be wise to begin clinical facilities "negotiations" by initiating exploratory discussions with service department personnel.

During these early talks the college team should be sensitive to the attitudes of the agency personnel toward college-sponsored health technician programs — many of which have few precedents. Unless the agency personnel fully understand and appreciate how the college proposes to prepare health service personnel, the necessary spirit of cooperation cannot be fostered. It is equally important that the college allow agency personnel sufficient time to study the program in terms of the particular contributions they will be asked to make.

As earlier noted, the circumstances within a given social setting will govern the college's strategy in establishing harmonious relationships. Although the circumstances and strategies may vary, the central objective in this phase of activity is uniform. The college seeks a clinical institution not only to serve as an extended campus resource, but as a willing partner through which the college is able to *extend its educational philosophy*. Since the program objectives are designed to reflect that philosophy, and the curriculum is organized to achieve the objectives, the clinical agency — from its board of trustees to its line staff— must be in accord with it.

CLINICAL AGENCY CONDITIONS AND SERVICES

Each specialized technical curriculum will require its own set of conditions and services within the extended campus resource. Some of these are fairly well spelled out in existing standards as drawn up by state licensing regulations and/or professional associations (e.g. dental hygiene, nursing). Other career offerings are so new as preservice programs that standards and guidelines for "clinical" activities have not been set forth (e.g. biomedical engineering technology, inhalation therapy technology).

The nature of each career program (and its aims and objectives) will suggest the kinds of clinical resources needed. A variety of health agencies may be utilized for student experiences. Among these are hospitals, clinics, health centers (public and voluntary), nurseries and nursery schools, physicians' and dentists' offices, rehabilitation centers, long-term care agencies, sanitation departments, clinical and biological laboratories, ambulance corps, etc.

There are some services and facilities that *all* health technology programs will require to a

greater or lesser degree. Th se* are:

1. Locker space or designated dressing area: Since instructors and students come to the agency at specified intervals, and frequently move back and forth between the college and the agency on any given day, lockers and locker rooms are needed. This would provide not only for the desired change of clothing, but also offer some place for students and instructors to keep personal possessions while they are in the agency. The number of lockers and the space needed will be determined by the pattern of the college program.
2. Work and conference space for instructors: Some space needs to be available for instructors. Ideally, this would be an office with a file cabinet. It is quite possible for several instructors to use the same office, especially if only a few of them are in the agency at the same time. This provides a place for instructors to keep records and teaching materials, as well as a private room for individual conferences with students. Some provision will need to be made for these.
3. Library facilities and reference materials: Library facilities at the agency are valuable. It is helpful if there are libraries to which students have access. These are not absolutely essential, however, since the college will provide library facilities. An arrangement for reference literature in the clinical unit is a different matter. If the agency does not or cannot provide for these reference materials in the patient areas where students are assigned, then it should make space available and must also provide some method of control for a unit reference library furnished by the college.
4. Dining facilities: Depending upon the pattern of the college program, it may be necessary to determine if the agency could grant students and instructors permission to use its dining room facilities. If students and instructors are in the agency at mealtimes, and no other satisfactory facilities are available in the immediate area, then some mutually acceptable arrangement must be made.

Lastly, records, reports, and manuals relating to the clinical agency's operation which would be of particular value to students in the educational program are as follows:

1. Census reports — daily average census relative to clinical services, diagnosis, length of stay, etc.
2. Manuals of policies and procedures — these may include institutionwide administrative manuals, and those of individual clinical departments: nursing, radiology, anesthesiology, medicine, diet, operating room, etc.
3. Patient records and charts
4. Treatment and medication schedules
5. Research studies of case records.

The above-named records should be maintained in an orderly system and available for faculty and student use as needed.

In addition to these general facilities, each

*This and the following section on nursing are adapted from *Guide to Selection of Clinical Facilities: For an Associate Degree Nursing Program*, University of the State of New York, the State Education Department, 1964.

technical program will require special clinical services and conditions. These constitute the *raison d'etre* of the clinical phases of health technology curriculums.

To illustrate how the health career programs have differing needs with regard to clinical experiences, four areas have been selected from the chart on page 14: they cover the spectrum of "clinical needs" as illustrated. They are, moreover, programs which have been developed in community colleges in significant numbers (i.e. nursing) or which are likely to be instituted as the need for manpower in those fields becomes increasingly critical.

It should be noted, incidentally, that no one health technology program can serve as *the* model for selecting extended campus resources for any other program. The criteria for evaluating the practicability of resources derive from the aims, purposes, and objectives of each individual specialty. Facilities that may not suit the needs of some programs could more than amply serve the purposes of others. For this reason, the importance of clearly defined program objectives is reiterated.

I. Nursing

A. *Clinical specialties*

Five major areas of clinical nursing should be considered in planning and are required by most states. These are medical, surgical, pediatric, obstetric, and psychiatric units.

The combined clinical areas should have a general representation of common health problems from the point of view of morbidity, mortality, incidence, and social significance. The patient population should be reviewed as to sex, age distribution, scope of illness, degree of disability, and socioeconomic levels for purposes of adequate selection and teaching.

B. *Patient care units*

The number of students to be assigned per instructor, the number of units to be used per group of students, the total enrollment planned, and the kind of learning experiences desired on any given unit will influence whether or not the basic nursing unit is suitable.

A unit capacity of twenty patients might absorb a group of four or six students with one instructor, but might present serious difficulties for ten or twelve students with one instructor. On the other hand, units of forty or sixty bed capacity might be useless for learning to give medication through the case method because of isolated medicine cabinets in small confined areas. A unit with a capacity of thirty patients consisting of private rooms with closed doors might be a more difficult place to teach fundamentals of nursing than an area with a capacity of twenty-four consisting of four bed units where the upper portion of the dividing walls are glass.

Overcrowded areas with extra beds in hallways or beds close together simply will not tolerate the physical addition of ten or twelve more persons to the scene. The lack of space for students and instructors to function effectively creates a real learning obstacle. The area should not be utilized beyond its capacity (except for emergencies).
A well equipped, centrally located utility room will save a great deal of time and effort that can be devoted to learning. Running water readily accessible to patient areas is helpful. An accessible medicine cabinet, well lighted, that is large enough to permit a good, visible organization of the drugs it contains and that is surrounded by enough space to permit several people comfortable occupancy facilitates learning. Adequate space for charting helps.

C. *Equipment and supplies*

Equipment and supplies necessary for nursing care should be complete, readily accessible for use, and in serviceable condition. A central supply department — well organized, efficiently functioning, and adequately staffed — is important to ensure the maintenance and flow of provisions.

If most or all nursing care procedures are to be taught in the clinical field, equipment for desired demonstrations (e.g. the use of an oxygen tent) or for planned student practice should be available. For example, if practice in handling and using syringes is planned, the number of syringes should be adequate to accommodate the number of students in the practice group.

D. *Instructional space*

Since nearly all clinical assignments for nursing students are preceded and followed by conferences, space for such activity will be required. Although several groups of students may sometimes have conferences together, there will definitely be times when separate conferences will be held for each individual group.

Preconferences are designed to enable students to plan the care they will be giving to patients. Ideally, then, conference space should be located within (or very close to) the patient area so that charts may be used as references should questions arise. Postconferences in the same area are desirable, but less critical. The space is determined by the size of the student-teacher group, but it should be comfortable enough to enable extra persons concerned with the teaching program to participate in the conference. Although not essential, a chalkboard is useful during conferences.

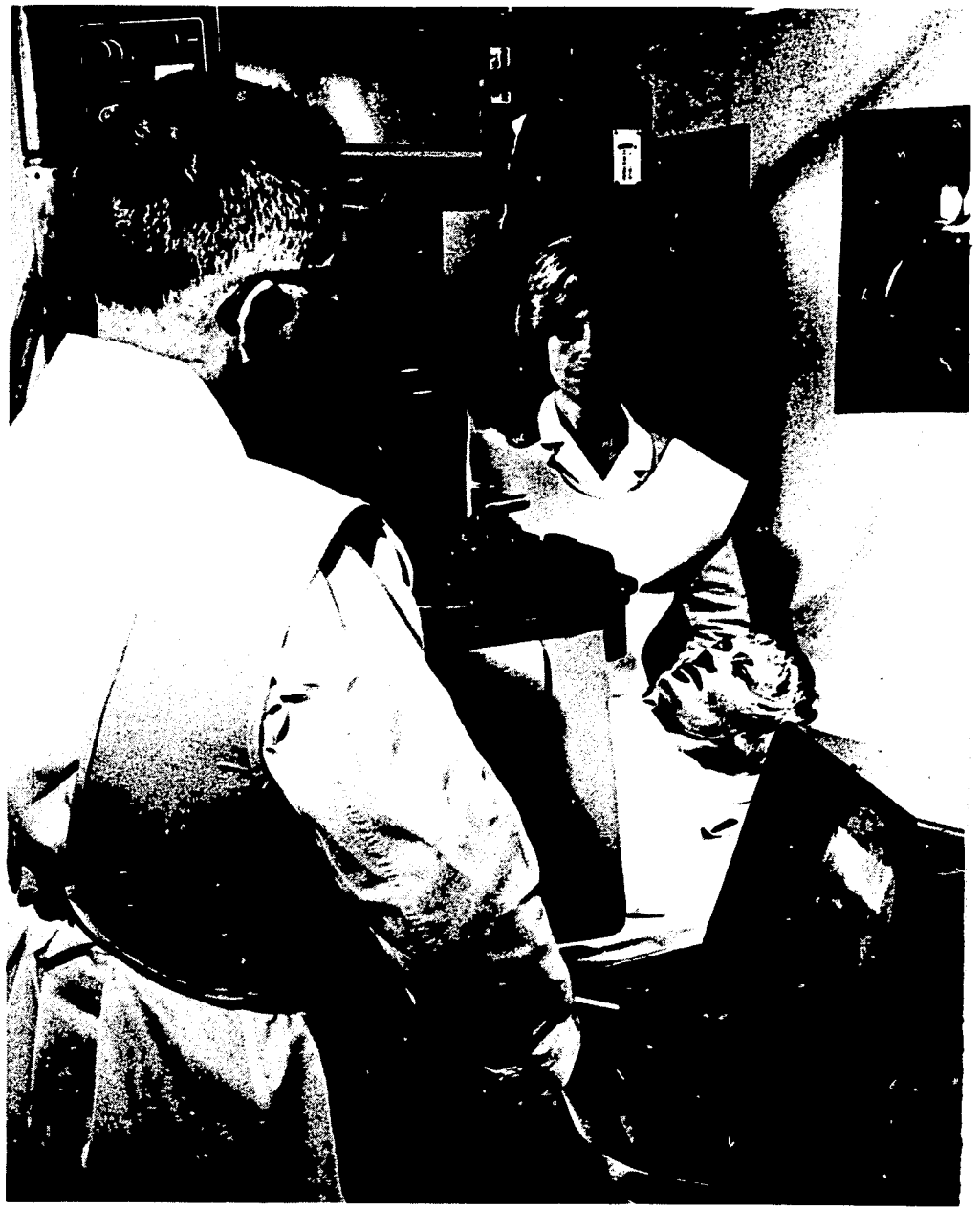
II. X-ray Technology

A. *Clinical procedures*

X-ray technology is a field that requires students to gain skills and competencies in the use of fairly complicated equipment prior to contact with patients. A well equipped on-campus x-ray laboratory would minimize the college's need to seek off-campus x-ray facilities. The college would seek off-campus facilities only to enable students to apply their learning and skills in clinical procedures.

In an average general hospital an estimated 100 (perhaps more) diagnostic procedures are performed by x-ray technicians. Of these, somewhat more than half require advance preparation of patients. This ultimately results in some semblance of a schedule which would give college instructors enough lead time to plan, with agency personnel, relevant experiences for students.

Many other procedures, however, are performed in response to emergency calls (accident victims, etc.) which cannot be anticipated. Being "on call" for such eventualities constitutes a major responsibility of practicing x-ray technicians. Consequently, it is conceivable that clinical practice schedules will include periods of time when students are not assigned specific kinds of film-taking experiences. This time can be spent in other learning activities relating to the clinical aspects of the field, but when the "emergencies" do arise, the students are in the agency and can be ready for the procedure as needed.



The major criteria in seeking clinical resources is that they 1) have sufficient varieties of diagnostic procedures done with relative frequency, and 2) are geared to deal with a relatively high volume of procedures. This is not to suggest that any *one* clinical resource must fit these criteria; this is not always possible, nor is it absolutely essential. It does suggest, however, that a single-purpose agency* will not suffice as the clinical resource for the entire program. Combinations of many such agencies may provide the necessary types and numbers of experiences students should have, but very careful clinical practice scheduling will be required.

B. *Clinical setting student-teacher ratio*

A second set of criteria suggests that the college exercise care in limiting its two-year student enrollment to the capacities of its community resources. If too many small or single-purpose clinical agencies become necessary to accomplish the objectives of the educational program for a given student enrollment, there is a danger of dissipating the energies and effectiveness of the technical faculty — particularly if their numbers are limited. The average student-teacher ratio for x-ray technology in clinical settings has been set at four to one. Depending upon the clinical facility, this figure may be modified slightly upward or downward.

Because the variables impinging upon the organization of a sound x-ray technology program in a two-year college are so numerous, the importance of employing qualified personnel (either as staff or as consultants) and of devoting sufficient time for planning is, *again*, underscored.

*i.e. an institution caring for patients *only* with respiratory illnesses, or *only* with ear, nose and throat disorders, or *only* with orthopedic problems, etc.

III. Inhalation Therapy Technology**

A. *Clinical service needs*

As does x-ray technology, inhalation (gas) therapy technology requires that students gain skill and knowledge in the use of sophisticated equipment. Technicians are not only responsible for operating their equipment, but they must be able to disassemble it for cleaning and sterilization (when applicable). In addition, technicians should be able to troubleshoot malfunctioning equipment, and, when possible, repair it. As a consequence, the time needed by students to develop

**Occasionally a technician in this field is called a "cardiopulmonary technician." Such a designation identifies the medical clinical specialists to whom the technician is responsible and from whom he receives direction and supervision.

and achieve these vital skills could be spent in an on-campus laboratory — if the appropriate resources are available.

However, unlike x-ray technology, few inhalation therapy procedures* can be learned under simulated conditions. Having developed and demonstrated competence in the use and care of equipment, and having gained knowledge and understanding of the rationale of inhalation therapy, students should be ready to apply these in clinical situations.

*Especially designed manikins are useful in demonstrating resuscitative procedures.

Inhalation therapy is administered to patients with diverse clinical conditions: it has also become a critically important adjunctive therapy in postoperative and intensive care units of hospitals. Many hospitals do not have discrete inhalation therapy departments, but this does not preclude their use as clinical resources, since inhalation therapy is administered by other service personnel — usually nurses.

The salient feature should be the existence of a medical specialty department or division in the hospital whose major interest is related to the use of medical gases. Most often this is the department of anesthesiology, but it may also be the department of cardiopulmonary diseases. In any event, inhalation therapy services are supervised by anesthesiology or chest physicians and it would be necessary that such clinical specialists be on the institution's staff.

A second feature the college curriculum team should look for is the availability of inhalation therapy equipment of sufficient variety and in serviceable condition. There should be a centralized area where students can clean, test, sterilize, repair, and properly store equipment. This same area, if large

enough, could serve as conference space where students can preview and review their learning activities.

B. *Modification of clinical activities as needed*

As therapeutic procedures for respiratory and cardiac conditions increasingly are used as a part of continuing medical management of patients, the inhalation therapy technician will be called upon to function beyond the environs of hospitals. In a few areas around the country, home care treatment programs have been organized. An important responsibility of technicians will be to teach patients to use inhalation therapy equipment and supplies. After patients have been discharged to their homes, the technicians will be responsible for making periodic visits to patients' homes to ensure that their treatment plans are appropriate to their needs. Where a home care program has been instituted, the college should try to plan clinical activities to include these experiences.

As cited several times, the purpose in using extended campus facilities must be clearly defined within the framework of local community settings and resources. Inhalation therapy, as a technical specialty, is constantly changing. Increasing need for and use of gas therapy, new kinds of equipment, and advancing surgical procedures (e.g. vital organ transplants) are just three factors contributing to the rapid growth of the field. Because of this, precise models for educating technicians are difficult to design.

Administrators and faculty of college sponsored inhalation therapy technology programs are advised to maintain continuing relationships with professional specialists to ensure educational relevancy of their programs. The college program advisory committee plays a vital role in meeting these kinds of needs.

IV. Medical Record Technology

Record keeping is an important activity and responsibility of all kinds of health service agencies, including animal hospitals and research institutions. It is virtually impossible for student medical record technicians to gain experience in record-keeping procedures in every type of agency, but the college should make every effort to include as many institutions as is practicable. One major reason for this is to have students observe the variety of coding and filing systems employed, since each agency has adopted only one system for its use.

A second reason is to have students observe how medical record personnel function in different settings. Ideally, every institution — research and nonresearch* —

*The term nonresearch may also be taken to mean "nonteaching." Typical agencies fitting this description are nursing and convalescent homes, homes for the aged and aging, proprietary hospitals, et al.

would employ a registered medical record librarian (R.R.L.) to supervise department activities; however, acute shortages of professionally prepared librarians make this impossible. Because of this, an accredited medical record technician (A.R.T.) occasionally assumes administrative responsibilities (particularly in nonresearch facilities where shortages are most acute).

Medical record personnel are often called upon to retrieve information and records for persons doing research. If opportunity is available for this kind of experience, it should be incorporated.

The professional organization (American Association of Medical Record Librarians) concerned with medical record science has suggested that two-year college programs provide 500 to 600 clinical practice hours. If a college is able to establish a fully equipped simulated medical record department (including the various filing and coding systems), the time spent in clinical settings could be appreciably modified; the necessary time for practice of procedures and techniques could be spent in the college laboratory.

Notwithstanding the existence of standards or guidelines for using resources beyond the college campus, their ultimate selection should be predicated on good judgment. Colleges, professional organizations, and health practitioners would do well to remember that health and medical services are in a constant and rapid state of change. It follows, then, that educational programs must keep pace with those changes. Wisdom, not tradition, should guide health technology curriculum teams in the development and organization of programs.

Because the need for using resources beyond the college campus varies so greatly from one health technology program to another, no one specific checklist of items to look for can serve all programs. As a means of evaluating the appropriateness of clinical facilities, the following general questions are suggested.

In terms of the educational objectives for each program, do the clinical facilities (when applicable)

1. Have the necessary representation of clinical services?
2. Have adequate representation of patients in terms of age, sex, socioeconomic profile, etc.?
3. Have sufficient volume and variety of clinical procedures?
4. Have adequate instructional space to accommodate the influx of students and faculty?
5. Have sufficient variety and quantities of equipment and supplies in usable condition and readily accessible?
6. Have adequate professional and auxiliary staff and facilities to enable students to spend their clinical periods engaged in relevant learning experiences?
7. Foster and deliver services of sufficient quality to qualify as reasonably ideal settings for students?

INSTRUCTION, SUPERVISION, AND EVALUATION OF STUDENTS IN EXTENDED CAMPUS RESOURCES

A collaborative effort between an education institution and a service agency goes beyond simple sharing of physical resources. It includes a sharing of responsibility in the instruction, supervision, and evaluation of students when they are in the extended campus unit.

Clinical agency staff are accountable for the total care of, and service to patients. Since college instructors cannot be with all students at all times, agency personnel necessarily play an important coadjutive role in the college's instructional program. Prior to concluding formal agreements for the use of clinical facilities, it is essential that college faculty and agency personnel roles, functions, and responsibilities regarding instruction, supervision, and evaluation of students (while they are in the agency) be clarified. The routines to be followed, the forms to be used, and the extent of agency staff involvement relating to the aforementioned will, of course, vary with each program and with local situations. For example:

1. Dental hygiene and dental assisting students may be assigned to practice under the direct supervision of practicing dentists in their private offices or in dental clinics or even in dental schools.
2. Dispensing optician students may be assigned to practice their skills under the supervision of specialists who own business establishments.
3. Environmental health technology students may be assigned to a governmental field office to collect data or do field sample analyses under the supervision of sanitary engineers or biologists.
4. Orthotic and prosthetic technician students may be assigned to practice under the supervision of orthopedists and physicians in rehabilitation centers or clinics.
5. Surgery technician students may be assigned to practice skills and procedures under the direct supervision of operating room nurses.

These are only a few examples of the varieties of situations in which students might function, but they serve to highlight how the college faculty would need to rely on clinical agency personnel to serve as active participants in the instructional program.

There is, perhaps, an even greater urgency underlying the need for instructional-role clarification. The criteria for evaluating students should be uniform; these derive from the educational objectives of the college program. Unless all participants clearly understand and concur with the program aims, a common base for evaluation cannot be drawn.

Lastly, it must be clearly understood that although there will be shared responsibility for the clinical phases of the instructional program, it is the sole responsibility of the college to decide the fate of students in the program. If the agency staff wishes to pass judgment on student performance, competence, behavior, or the like, it should be done

through the college faculty member who is responsible for the program. In short, lines of communication must be established and honored if confusion is to be avoided.

CONTRACTUAL AGREEMENTS

When all the details of health technology program affiliations have been thoroughly discussed and mutually agreed upon, a written agreement should be prepared and signed by representatives of both the college and the clinical agency. If the college plans to use more than one clinical resource, then a separate agreement with each of the resources should be promulgated.

The content and form of the contract should be general enough to permit flexibility to make minor modifications in the conduct of the program, yet sufficiently specific to clearly demonstrate each institution's major responsibility for the clinical phases and activities of the program.

Unless required by local ordinances, the final contract need not be a legal document to the degree that it becomes enforceable to the letter. In fact, such a document would be undesirable if, for mutually acceptable reasons, the agreement should require revision or premature termination. On the other hand, the terms of the contract should not be so vague or ambiguous as to be useless as a guide for either institution.

The principal headings should be a) specific responsibilities of the college; b) specific responsibilities of the clinical agency; and c) mutual responsibilities. Beneath these, the following considerations should be grouped:

- The formal responsibility for the educational program
- The extent to which the college seeks to use the extended campus resource
- The management of disciplinary affairs
- The extent to which the agency provides resources and adjunct instructional staff
- The health requirements of, and procedures to be followed for, students and instructors
- The management of medical emergency problems of students and instructors while they are in the clinical facility
- The provision of class, conference, and office space, locker or dressing room facilities, and dining arrangements
- The extent to which students and instructors would be expected to comply with the clinical institution's rules and regulations
- The arrangements for legal protection of students and instructors while they are in the clinical agency.

Finally, periodic review of contracts should be planned to determine their continuing relevancy to the objectives and goals of the health technology programs. Such documents cannot serve indefinitely because the curriculums they reflect will not remain static. Social and technological thrusts demand constant curriculum reform and modification of educational programs to prepare health service personnel. The techniques and procedures for implementing instruction, therefore, will require frequent change.