DEVELOPMENT OF A MODULAR EDUCATION PACKAGE : PRACTICAL SKILLS FOR SAFE AND EFFECTIVE HANDLING OF PATIENTS AND CLIENTS

by

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Development of a Modular Education Package: Practical Skills for Safe and Effective Handling of Patients and Clients

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ABSTRACT

PROBLEM

As awareness of the importance of preventative medicine has grown and with the increasing costs of health care associated with staff injury, a growing number of employers are requiring staff education in these areas. The G.F. Strong Centre Physical Therapy Department in Vancouver, B.C. serves as a source of staff back-care education and patient handling skill training for the lower mainland community. Requests for education from the community had been met through the assignment of staff physiotherapists to the various requesting organizations. The format and content of the teaching was left to the individual physical therapist. As the number of these requests continued to grow, the Physical Therapy Department decided that a more formal and marketable education package was needed which would allow for quality assurance, intertherapist content consistency and specificity in lesson content for the client.

AT PRESENT

Currently, there are no formal guidelines for curriculum for the physical therapists at the G.F. Strong Centre to follow when meeting the external requests for back care and patient handling skills education.

SOLUTION

This thesis consists of the development of an education program which can be utilized by Physical Therapy Departments, such as the G.F. Strong Centre Physical Therapy Department, in the education of

health care professionals. Ralph Tyler's basic principles of curriculum and instruction were used to assist in the design of a curriculum which meets the specific needs of the clients in the health community. The program is modular in design to allow for specificity of choice for the client. These modules cover six areas: Introduction to Wheelchairs, Wheelchair Portering, Transfer Skills, Patient/Client Positioning, Bed Mobility and Introduction to Disability.

EDUCATIONAL RELEVANCE

With a growing emphasis on preventative medicine and the use of effective patient handling techniques in the prevention of injury, effective means of educating health care workers are becoming increasingly sought after. Experts in the area of patient handling skills, such as the G.F. Strong Centre, are acknowledging that the tools for such education need to be such that relevant information can be imparted in a manner that assures quality and relevance of content. This thesis provides such a tool. It provides expert information in a format which allows for specificity of content for the student while allowing for creativity of presentation for the presenting professional. The material contained in this document will serve as a useful tool for physiotherapists involved in the teaching of patient handling skills.

DEDICATION

THIS THESIS IS DEDICATED TO:

MY PARENTS, **HEINRICH RASCHKE** AND **PAULA RASCHKE**, FOR THEIR UNDYING SUPPORT AND ENCOURAGEMENT,

MY GRANDMOTHER, **THERESIA RIEDER**, FOR HER UNFAILING OPTIMISM,

MY SISTER, **SILVIA RASCHKE**, FOR HER FAITH AND FRIENDSHIP

AND TO MY HUSBAND, **PATRICK J. RYAN**, FOR MAKING THE JOURNEY AN ENJOYABLE ONE.

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BACKGROUND

Injury in the workplace has long been a problem but, in the past, such injury had been taken for granted or was seen as a normal expectation in jobs which placed physical demands on their employees. The health care industry has not been immune to this phenomenon. Looking back one decade, studies have shown that the work place has been plagued with injuries to employees resulting in disabling pain, loss of work time, cost of replacement of injured personnel and training of new staff and increased insurance rates (Fitzler, 1982; Melton, 1983; Greenwood, 1986). In the early 1980's back injuries were cited as quickly becoming the main source of industrial absenteeism (Wollenberg, 1989). At that time, it was estimated that 28% of the U.S. industrial population would suffer from some disabling lower back pain at some time. In 1978 U.S. industries lost 25 million work days and spent 14 billion dollars on treatment and compensation for low back injuries. Berwick, Budman and Feldstein,(1989) report that low-back pain accounts for more work days lost that any other single symptom in the U.S.A. and is the major reason for compensation for work-related disability.

Studies have shown that, in the health care industry some of the primary mechanisms of low-back injury involve lifting and client handling (Greenwood, 1986). Staff who are involved in the physical handling of clients may experience inadequate time or training to safely carry out their duties. This is due to a number of factors ranging from lack of administrative awareness of the importance of back health education to lack of educational

resources in this area (Morris, 1984). In 1982, G.F. Strong Centre (The Centre), a pioneer in the area of patient transfers (Ford and Duckworth, 1987), reported a 2,146.75 hour work time loss related to injuries resulting from the physical transfer of patients. Another 719.5 hours of work time were lost due to injuries involving staff moving other objects. As a result, in 1982, 382 days of work time were lost due to work related injuries involving the physical lifting of clients or other items (G.F. Strong, 1983). More recently, a Statistics Canada report, which was based on Workers' Compensation Board claims between 1982 to 1990, indicates an increase of thirty-three percent in back-injury claims in this period (Statistics Canada, 1992). This is fifteen percent more than the increase in claims for other types of work-related injuries.

Over the past decade, employers have become increasingly concerned about the loss of work time incurred through injury and about the high compensatory costs of replacement and training of staff and the increase in insurance rates (Morris, 1984; Chenowith, 1983; Fitzler, 1982,1983). As well, workers and their unions are becoming less tolerant of unhealthy work environments and practices. This shift from acceptance of injury in the workforce to prevention of injury follows a trend in which many companies are realizing the need to provide health promotion opportunities for their employees (Naisbitt, 1984; Fitzler, 1982)). As the awareness of prevention of injury and disability has increased and as the cost of health care and time lost due to injury has

increased a growing number of institutions, businesses and industries have placed greater emphasis on prevention of injury and self-management of health and well-being (Melton, 1983). This emphasis has led a growing number of employers to initiate prevention and health promotion programs for employees. One such company, American Biltrite, Inc, offered the Chelsea Back Programme to its employees. This was a multifaceted program including elimination of workplace hazards, attitudinal training aimed at increasing understanding of back injury and technique and back care education. Within one year of the program, total back injury claims were down by ninety percent (Wollenberg, 1989). In the lower mainland of British Columbia, a similar program was initiated at the Royal Columbian Hospital in New Westminster. The primary cause of work time loss in the mid 1980's was identified as back injury. Based on this, a six month trial of a back education program was given a trial test in 1985. This program involved educating all staff in back care education and training in approved patient transfer techniques. The reduction in reported back injuries was significant and the hospital has since maintained the program with satisfying results (M. Brook, personal communication, September, 1992).

Naisbitt (1984) predicted that this shift to self-management of health would be embraced by employers and employees alike, and in Vancouver, as services to disabled clients in the community has increased, a growing number of groups from within and outside of

the Centre have approached the Physical Therapy Department for information and education regarding prevention of staff and client injury related to the handling of clients. In British Columbia, a growing number of organizations who train health care workers or employ staff who work with clients with disability as part of their job description are becoming involved in providing their employees or students with the education necessary to enable them to work in an healthy environment. Specifically, the areas of back injuries caused by improper client handling are the focus. Over the last decade a number of these employers have approached G.F. Strong Centre for assistance in educating their staff in patient handling skills and back injury prevention. These requests were forwarded to the Physiotherapy Department as the requested knowledge fell into that departments area of expertise.

CONTEXT

G.F. Strong Centre has been serving the community since 1949. Originally opened as a facility to meet the needs of the disabled veterans returning from World War II, the Centre is the major source of rehabilitation services for the province of British Columbia and the Yukon. G.F. Strong Centre is accredited by the Canadian Council of Health Facilities Accreditation and is affiliated with the University of British Columbia (British Columbia Rehabilitation Society, 1991). It offers specialized services which are not offered elsewhere in this region. Patients with severe disabilities resulting from spinal cord injury, arthritis, stroke, brain injury, amputation, multiple sclerosis, cerebral palsy, spina bifida and burns come to G.F. Strong for attention from a multidisciplinary team which ranges from Physical Therapy (P.T.) and Occupational Therapy through to Social Work, Sexual Health and Psychology.

Although the Centres' primary mandate is with clients registered with the Centre, there is a commitment to the community and to providing educational and consulting services to that community. The Centre Philosophy is, in part, as follows: "We, the Board and Staff of the G.F. Strong Centre commit ourselves to disabled individuals, their families, **the community,** our Centre and each other to actively pursue the following Centre Philosophy. We believe that rehabilitation involves disabled individuals working to attain their highest level of independence and quality of life. Toward this end, we further believe that:

Education

Patient and family education leading toward an understanding of the disability and its management is a necessary component of rehabilitation. **The education of health science professionals and students, and continuing education of all staff is essential to maintain and improve the Centre's effectiveness.**

Community Relations

The Centre is a vital part of the community we serve and within the community, we have an active **contributing role to improve services for the disabled through education to enhance understanding of the disabled throughout the province."** (G.F.Strong Centre, 1992).

The Physical Therapy Department, as a part of the Centre team shares the above philosophy and exercises it in it's areas of expertise. The Physical Therapy Department at G.F. Strong Centre identifies seven distinct areas of responsibility. Two of these are directly related to education.

Patient\Family\Care Giver's Education

Education of clients includes one to one work with clients, class work, preparation and dissemination of educational materials and presentation of workshops.

Education To P.T. Students, Staff, Health Care Professionals (internally and externally), Community Agencies

Education within this area includes inservices, workshops and lectures for extradepartmental groups, continuing education, student placements, clinical visits (for students in the health professions), orientation of staff, consultation services and

professional committee membership. (G.F. Strong Physiotherapy, 1992)

Taber (1993) defines physical therapy as rehabilitation concerned with restoration of function and prevention of disability. Health education has been described as any planned activity which promotes health or illness related learning, and, therefore, some relatively permanent change in an individual's competence or disposition (Tones, 1990).

PROBLEM STATEMENT

The Physical Therapy Department has always provided transfer education services for departments within the Centre. External requests were met by assigning department physiotherapists to teaching assignments outside of the Centre as needed. The format and content of the teaching was left to the professional discretion of the individual physical therapist. As the requests from outside organizations continued it was decided by the Physical Therapy Department that a more formal and marketable education package which would meet the needs of the patients while allowing for quality assurance, intertherapist consistency in content and specificity in lesson content for the client was needed. In 1988 a committee consisting of two staff physical therapists (myself and one other) and the assistant director of the department was struck to address this need. Back care education outside of transfers skills and equipment handling has been developed at the G.F. Strong Centre and so was not a component of this package.

PACKAGE DEVELOPMENT

Audience

In order to develop an education package the committee first determined who the potential client population was. In the past, clients had come to the Centre, either as a result of word of mouth within the health care community or through the recommendation of previous patients and clients at the Centre and through employees of the Centre. The majority of these external requests came from the public transportation industry and from home care givers and institutional care givers such as rest homes, licensed practical nursing programs, attendant programs and drivers of vehicles for the disabled. Occasionally, requests would come from educational institutions from around the lower mainland ranging from elementary schools through to institutions of higher learning. This client population ranged, educationally, from the layperson with no medical or health care education through to students with a basic to reasonable level of such training.

Content

Downey and Feldman (1986) state that the planning of health education programs is enhanced by consideration of a target population's health care interests and practices. It has been said that an important missing link in effective health education program development and implementation is identifying the interests and practices of the potential recipients of such programs, (Kunstel, 1978). Green, Kreuter, Deeds and Partridge (1980) suggest that without input from the customer, health education programs are based on guesswork and run the risk of being misdirected and ineffective.

The content most commonly requested of the physiotherapy department was of a very practical nature. Most requests were for instruction in the areas of physical lifting or transferring of the disabled patient both while in a wheelchair and out of a wheelchair and covering a variety of terrain. Another common request was for information regarding the nature of a great variety of disabilities with a particular focus on the physical ramifications of disability and how these would interfere or interact with social and physical interaction with the disabled patient. Formulating this information into a concise, repeatable format was the next challenge which faced the committee. An initial menu of choices was drawn up at which point funding for this program ran out and the project was put on hold. One year later the development of an education package which would address the areas outlined by the original committee was undertaken by myself as part of this thesis.

Development/Discussion

In order to develop the proposed education package for the Physical Therapy Department I have attempted to answer or, at least, look at the four fundamental questions which Ralph W. Tyler put forth in his book, Basic Principles of Curriculum and Instruction, (1949):

1. What educational purposes should the school (educator) seek to attain?
2. What educational experiences can be provided that are likely to attain these purposes?
3. How can these experiences be effectively organized?
4. How can we determine whether these purposes are being attained?

A review of the literature identified a number of factors to consider when selecting learning experiences (Tyler, 1949; Taba, 1962; Pratt, 1980; Oliva, 1993; Posner and Rudnitsky, 1986; Wulf and Shave, 1984). A brief summary of these factors follows: Learning experiences should:

1. Afford students with the opportunity to practice the kind of behaviour implied by the learning experience.
2. Allow students to obtain satisfaction from carrying on the kind of behaviour implied by the objectives.
3. Desire reactions which are within the range of possibility for the students.
4. Acknowledge that many experiences can be used to obtain the same educational objectives.

5. Acknowledge that a learning experience will usually bring about several outcomes.
6. Be consistent with the social and cultural realities of the times.
7. Facilitate transfer of skills from one area to another.
8. Ensure that the students understand the objectives of the learning.
9. Allow for a variety of approaches and styles in learning and teaching.
10. Be well organized.

Upon comparing the literature I found that Tyler, within the framework of his four fundamental questions, encompassed the majority of factors listed above. Because of this I chose to use Tyler's fundamental questions as the framework within which to develop this educational program.

1. WHAT EDUCATIONAL PURPOSES SHOULD THE EDUCATOR SEEK TO ATTAIN?

The purpose of the education package which has been developed for the G.F. Strong Centre is defined by the external parties who have approached the department requesting these materials. The primary objective outlined by these sources is for their students or employees (the learners) to leave the courses\workshops\lectures with practical skills which they will be able to use throughout their work day. As indicated by the learners, injuries resulting at the workplace are a fact and these injuries are often the result

of improper patient-handling techniques or unfamiliarity with the equipment encountered by the employees at the workplace. As a result, one of the objectives for this package is that, by the end of the lesson, the learner will be able to execute patient-handling skills, as described in the modules, consistently. However, in view of the fact that most of these organizations give their employees introduction to basic patient handling skills, it must be acknowledged that there is still a gap between acquisition of practical skills and translation of this into healthy use of these skills.

The need which would bridge the gap between knowledge of proper technique and proper application of technique is the need for a body of knowledge which will allow the student to apply techniques safely and appropriately (Greenwood,1986). It should be noted that there are a variety of patient and equipment handling techniques but the key to proper use is deciding which technique is appropriate for which patient or piece of equipment. Therefore, another objective of this education package is that, by the end of the lesson, the learners will be able to choose the appropriate patient handling technique for any situation that they might encounter. The G.F. Strong Centre is frequently approached by groups and organizations with requests for disability awareness lectures. This includes groups who will be involved in physical patient and equipment handling as well as groups who will be interacting with patients with disabilities but who will have no

actual physical contact with them or their equipment. Interest in this area is not merely for understanding of disabilities in a social\theoretical context but also from a very practical need. Because some disabilities exhibit physical manifestations which can impede the students' objective of safely and efficiently lifting the patient either with equipment or without, students require a knowledge of these physical manifestations in order to execute the most safe technique. Knowledge in this area assists the student in problem-solving when choosing appropriate techniques. Therefore, another objective for this package is that, by the end of the lesson, the learners' will have the basic understanding of the disabilities which they encounter when working with patients which will enable choice of the appropriate technique for the specific patient.

So, the objectives for the education package for the physical therapy department at the G.F. Strong Centre are as follows:

By the end of the lesson:

1. Learners will be able to execute patient-handling skills, as described in the modules, consistently.

2. Learners will be able to choose the appropriate patient handling technique for any situation that they might encounter.

3. Learners will have the basic understanding of the disability with which they are working which will enable them to select an appropriate technique for a specific patient.

2. WHAT EDUCATIONAL EXPERIENCES CAN BE PROVIDED THAT ARE LIKELY TO ATTAIN THESE PURPOSES?

According to Tyler, there is a difference between the content of an educational program and the actual learning experience which takes place. In response to the request of the clients interested in an education package, the package which has been developed for the G.F. Strong Physiotherapy Department focuses less on theoretical content and more on a practical content.

Following Tyler's five general principles for selecting learning experiences, an assortment of experiences was designed. To begin with the principle that learning experiences must enable students to practice behaviours implied by the objectives, the objectives need to be reviewed. The objectives for this package dictate that students will be able to execute patient handling skills consistently, as described in the modules. As the learning modules are set up, students are provided with practical guidelines for executing safe and efficient transfers of clients. These written guidelines are presented to the learners during the course of workshops which are based on demonstrations of practical techniques followed by practice of these techniques by the students. Throughout the workshop, the learner is required to repeat the same skills throughout a variety of scenarios and with a variety partners.

This form of practice is accompanied by the observation and

tutelage of the instructor. By the end of the workshop, the student will be allowed ample time to practice each transfer and patient handling skill which is outlined in the theory. As the objectives show, consistent repetition of taught skills is not the only outcome desired of the students. It is anticipated that they must also be able to choose the appropriate patient handling technique for any situation that they might encounter. This skill requires the ability to connect pieces of information about the patient who is to be physically manipulated and information about the abilities and resources available to each individual student. By presenting the student with a variety of resources (such as technique checklists and disability descriptions and implications) and by incorporating all of these resources into the practical component of the classes, students are given the opportunity to pull the theory they have learned together with the practical skills they have learned. This is directly related to the third objective, that the learners will have the basic understanding of the disability with which they are working which will enable choice of the appropriate technique for the specific patient.

Another principle relevant to the selection of learning experiences is that of providing satisfaction to the students as a result of carrying out the learning experiences. As the package is set up, students are provided with the opportunity to perfect skills which they are already using in the workplace or will be using upon graduation from their program of study. The particular modules of

the education package which are used for each workshop are selected by the students or their employers. This enables each workshop to be as pertinent as possible to the student's actual work experience. Often learners approach the G.F. Strong Centre because they have had specific problems with handling of patients and by tailoring their workshops to these specific problems the learning outcome can be quite satisfying. A further suggestion made to workshop leaders is that students have an opportunity to try to solve problems that have arisen in the workplace.

A third principle for appropriate selection of learning experiences is that the reactions desired in the experience are within the range of possibility for the students involved. This education program has been developed as a response to a need conveyed to G.F. Strong Centre by a variety of local organizations. None of the material covered within the education package is outside of the scope of skills which the learners must have in order to perform the particular work they do. Students who are unable to perform these skills would also be unable to work at these work sites.

A fourth principle is that there are many particular learning experiences that can be used to attain the same educational objectives. Because the content of each learning module is consistent from workshop to workshop, a variety of instructors can be called upon to teach components of the package to clients. Each instructor is given the professional freedom to impart the content

in whatever manner they see as appropriate, keeping in mind the particular needs of each group of students. Suggestions are made as to the different learning experiences which have been successful for previous students.

The fifth principle suggested by Tyler is that the same learning experience will usually bring about several outcomes. With the education package developed for this thesis, there are some very specific outcomes which are desired in order for it to be viewed as successful. The students need to come away from the learning experience with a greater ability to safely and efficiently assist in the transfer of patients. However, beyond this ability, students should also leave the program with a greater understanding of why they are doing the things they are doing and with a greater understanding of why their clients respond to interactions with them the way they do.

3. HOW CAN LEARNING EXPERIENCES BE ORGANIZED FOR EFFECTIVE INSTRUCTION?

Some discussion regarding the format in which this educational program has been imbedded is necessary to justify the choice of that format. Because the body of knowledge which is dealt with in this educational program is very specific and defined and expresses the standards supported by the G.F. Strong Centre, there can be little deviation from the actual content. However, the media through which this content could be conveyed to the student are

many. Choices could have included lecture format with little to no student participation, learning by video (techniques depicted on video and reviewed by students), or on the job learning with techniques being taught by co-workers, or combinations of these and other procedures. The chosen format is that of a series of modular units comprising the complete educational program and which emphasize competency or mastery learning.

Mastery learning, as defined by Bloom (1974), is a manageable set of individualized instructional ideas and practices that have consistently helped many students learn excellently, swiftly and self-confidently. The basic elements of this teaching/learning strategy include:

1. The learner must understand the nature of the task to be learned and the procedure to be followed in learning it.
2. The specific instructional objectives relating to the learning task must be formulated.
3. It is useful to break a course or subject into small units of learning and to test at the end of each unit.
4. The teacher should provide feedback as to the learner's particular errors and difficulties after each test.
5. It may be profitable to provide alternative learning opportunities.

By the 1980's, the Network of Outcome-based Schools emerged from the mastery learning movement (Block, Efthim and Burns, 1989). This network defined the features of successful mastery learning or

outcome-based education (OBE):

A. Philosophy: Instruction can be organized so that virtually all students can learn the information, concepts and skill embodied in the curriculum.

B. Instructional Strategy: revolves around a curriculum component that consists of goals and objectives for courses or programs of study, standards of student performance which directly embody the goals and objectives and curricular materials sequenced in a logical fashion to support attainment of the outcome goals.

An assessment system is used which is capable of providing evidence of student attainment or non-attainment of the established mastery standards.

Essentially, mastery learning involves providing a structured learning sequence for teaching essential skills.

Modules (sometimes referred to as units) have been defined by a variety of authors. Jonathan (1987) states that a module represents a free-standing unit of study, which can also form a component in a larger course or group of modules. Bell (1981) describes modules as multimedia kits of assorted classroom materials based on single themes and Levine, Daeschner and Emery (1977) describe instructional modules as units of instructional materials which contain objectives describing learning behaviour in clearly observable form, instructional material in text or audiovisual form, practice exercises based upon the instructional

material and a posttest clearly related to the objectives. The module represented in this thesis subscribes to a combination of these definitions, it encompasses units of instructional materials in text and audiovisual form, practice exercises and opportunities for demonstration and return demonstration followed by immediate instructor feedback and is based on a specific and constant body of knowledge.

To examine the relevance of a focus on mastery learning and modularisation for this body of knowledge four areas will be explored, namely, relevance in terms of the student, the curriculum, the instructor and the institution.

The Student

The literature gives much credence to the value of student involvement or, at least, student acknowledgement when planning curriculum. Tyler (1949) states that the investigation of student interests demands particular consideration and that students interests must be identified so that students will actively participate in curriculum. Morris (1984) tells us that the single most important factor which contributes to success in health education programs is the ability to motivate students. Posner and Rudnitsky (1986) feel that it is the teachers responsibility to design environments that are likely to engage students in such a way that the students are motivated to learn.

The modular format focused on mastery learning can enhance the ability to motivate students to learn. By allowing students to survey a menu of curricular choices, they are able to define which combination will be most relevant to their interests and needs. The literature shows that student choice is likely to increase motivation and effort by giving them a greater stake in the process (Goldschmid and Goldschmid, 1981) (Jonathan, 1987) (Giddings, 1987). By affording students the opportunity to choose their curriculum, greater responsibility is placed on the student for seeking out knowledge and new skills and the opportunity for teaching students skills which are not relevant to their situations is decreased. Other advantages of modularisation for the student include increased cooperation between students and teachers as the responsibility for learning is shared by both and students are able to identify specific areas of weakness and target those specific areas as opposed to having to complete an entire program of study. Increased cooperation between students is also encouraged as the emphasis is less on teacher dependence and more on interactive, student driven learning. In this particular program, students are given opportunities to discuss relevant issues and suggest possible solutions. This exchange of ideas and solutions to actual problems faced in the workplace is of particular value in the health care field as the nature of the work demands that staff work together for problem solving and task achievement. Because of the existence of specific competence levels, students are able to work towards tangible goals of competency and, having chosen these competencies

as important for their work situation, students should achieve personal satisfaction in the achievement of these goals.

One criticism of the modular format in regards to the student might be that if students alone chose only modules which interested them, the breadth and balance of learning could be compromised. This is addressed in this thesis with the introduction of prerequisites for the modules where appropriate. For example, a student who possesses superb patient-handling skills (as in transfer skills) would prove to be a detriment to their work environment if they did not possess a knowledge of body mechanics or an understanding of the physical ramifications of disability types that they might encounter. As such, the presence of prerequisites, an indication of a prior level of competence, ensures that the necessary breadth and depth of a skill area is complete.

The Curriculum

There are many arguments for and against modularisation in regards to curriculum. Some would say that this format allows for greater flexibility of curriculum and for design which is flexible or responsive to change (Jonathon, 1987) (Bell, 1981) (Van Eijl, 1986). Because the units are short and quite specific in content it is relatively easy to revise individual modules without having to undertake the greater task of revising an entire program of study. It is also conducive to the incorporation of new material with the introduction of new modules. Modularisation can also be

effective in reducing redundancy in the curriculum. Because of their independency and specificity of content they can be used interdepartmentally as opposed to having the same material taught over again in different departments. Conversely, modularisation is feared by some (BTEC cited in Jonathon, 1987) as an avenue for the fragmentation of bodies of knowledge. This would be ensured if coherence of material, repetition and inter-relationships were ignored in the development of the modular program. The setup of this modular program is protected from fragmentation by the interdependence of the various modules. While some stand on there own, as independent bodies of knowledge, the majority require prerequisites, many of which are other modules in the program. The modular program depends on the achievement of competencies which are the building blocks or foundations for subsequent modules.

Others fear that this approach is too structured (Giddings, 1987) or dry or inhibiting of instructional creativity. An effective module should exhibit three components: clear, well defined objectives, methods conducive to competence mastery and well defined evaluation procedures which relate directly to the already mentioned behaviourial objectives. Within these components, a module can designed so as to be highly structured or programmed or they can be designed to allow for great latitude on the part of the instructor. This education program has been designed in a highly structured and programmed manner. Although there are a choice of teaching approaches or suggested methods, primarily, each module is

quite set in its content and mode of information dispersal. The defence of the former is that the knowledge base contained therein is a very specific body of knowledge which is sanctioned, as is, without deviations, as the safest and most efficient means of patient handling as dictated by the G.F. Strong Centre. One of the motivations for the initiation of the development of this education program was the perceived need to have a set content which would be consistent between instructors and which could be guaranteed to each new set of students as being exactly as set out in the menu. Rigidity of content is necessary in this context for safety and accountability. The defence of the latter, structure of information dispersal methods, lies in one domain, expertise in teaching.

Due to the nature of the content, the educational program developed in this thesis will be taught by non-teachers. The primary teachers will be physical therapists, experts in the program content but not experts in the teaching of curriculum. Within this pool of therapists, some will be natural teachers, others, while exhibiting competence and professional rigour in their chosen field, will not be teachers, neither through natural aptitude nor through training. In order to ensure consistent effectiveness of teaching between therapists, this structure has been built into the program. It will allow natural teachers to be great teachers without having to take time away from their primary role, staff therapists, for curriculum development and it will give the

essential tools to therapists who, conscripted to the role of teacher, may have may have little skill in effective planning or teaching of curriculum.

The Instructor

It is in this area that the most resistance to instructional modules appears to be generated. Instructors may feel that their expertise in an area is not fully acknowledged if they must follow the specific format of the module and that they lose freedom and flexibility in regards to the content of the modules. In part, this is true. One of the dictates of the modular program defined in this thesis is that the instructor remain true to the content as laid out. If the instructor was not involved in the development of the module this may seem restrictive. However, as discussed earlier, because of the nature of the content in these modules, they must be adhered to strictly to ensure interinstructor content reliability. One of the rationales for the development of the program was to ensure that the content which was being taught by a variety of instructors was representative of G.F. Strong Centre, not of the individual instructor.

Block et al. (1989) states that staff with little involvement or influence in decision making tend to develop no feelings of ownership in new programs and participate, if at all, in only perfunctory ways. While this program has been designed for the

staff who will be teaching it, it should be noted that the designer of this program was involved in teaching this content while an employee of G.F. Strong Centre. The content was gleaned not only from personal professional experience but also from the feedback and assistance for content development contributed by the staff therapists who will be undertaking the role of teachers of the program. The content, then, is owned by the physical therapy department, in that it is from within this structure and under its guidance that the content developed as it did.

Some benefits of this format for the instructor can be outlined. Because the content is specified, teachers' guides are provided and instructional aides are provided, the instructor has time freed up which can be utilized for professional development, involvement in research and patient care. This is particularly important in health care as time is finite and caseloads can be very hectic. Also, because classes tend to be made up of students who want to be there and who consider the course content to be relevant and, because energy is not expended on curriculum development, the instructor can concentrate on the process of learning as opposed to the content (Goldschmid and Goldschmid, 1973). This format, which places emphasis on student activities as opposed to teacher activities, allows the teacher to concentrate on the role of motivator, advisor and resource person as opposed to information disseminator. This increased opportunity for personal contact with students allows for a more accurate frame of reference from which

to evaluate each individual student on the outlined competencies.

The Institution

The modular approach focused on competency bears some definite benefits in regards to the institution. Neill (1978) states that curricular accountability is a topic which has been talked about since the 1960's by administrators. This is echoed by Jonathon (1987) who states that this format ensures that what is desired by the institution is, in fact, what is taught, and that, thereby, there is little scope for the dispersal of undesirable content. The nature of modules, short units with specific content and learning outcomes, help to ensure that the content which is representative of the institution is, in fact that content which is taught. Also, the institution can expect a multitude of instructors to ably teach the modules. Because content, outcomes and suggested methods are made available to the instructor, the instructor does not have to be an expert instructor. As a result, the institution has a wider pool of instructors to chose from. Goldschmid and Goldschmid (1973) and Jonathon (1987) state that this can positively enhance cost-effectiveness of teaching. This is certainly a pertinent consideration in todays health economics.

Tyler (1949) states that three major criteria must be met in order achieve an effectively organized group of learning experiences. These three criteria are continuity, sequence and integration. The format of this education package is modular in nature. The

basic theme of the package is patient-handling skills. This theme is broken down into six sub-themes or modules. Each module is a complete unit; however, some modules serve as foundations for other modules. As a result, each module is described as requiring certain prerequisites or as being independent of other modules. This fulfils the criteria of sequence as each module serves as a stepping stone to the subsequent module, with the concepts in the prerequisites enabling mastery of the skills in subsequent modules. Continuity is provided through this format in the progression of skill mastery from one module to the next, with ample opportunity to practice increasingly complex skills. Integration is achieved through the interrelatedness of concepts between modules. For example, knowledge of the physical and cognitive implications of physical disability impacts on effective patient-handling skills.

When the organization of this package was contemplated, the needs of the clients were investigated. Each group who approached the physiotherapy department had its own set of needs peculiar to the areas in which it provided a service. For example, a request was made by a Volunteer Department for orientation of new volunteers to disabilities. This request was based on the need of individuals who may have never encountered people with disabilities before and would be interacting socially with the disabled community. This group had no need for education regarding client-handling skills.

In comparison, the Recreation Department of the same facility

requested the same module as the Volunteer Department, but also required instruction in patient handling skills as they would be required to physically assist patients in and out of their chairs as well as be familiar with the physical and social needs of the disabled population with which they would be interacting. Within each module the skill areas are broken down even further to allow for very specific choice of educational needs. This breakdown of educational choices into very specific information packages and skills not only allows clients to tailor the educational program to their own needs but also assists the Physical Therapy Department in the area of quality assurance. The modular package with it's itemized content ensures inter-instructor consistency and ensures that the client gets precisely what has been outlined in the "menu" of choices. This format also allows for easier transfer of classes from one instructor to the next. Previously, the same instructors always taught the classes as they were familiar with the needs of the clients through ongoing experience with the same clients.

4. HOW CAN WE DETERMINE WHETHER THESE PURPOSES ARE BEING ATTAINED?

This is a question which can not be fully addressed in this thesis. In order to evaluate this package it first needs to be implemented. There have been a few factors which prevented immediate implementation of this package. To begin with, funds are currently not available to produce the audio-visual aids needed to supplement the modules or to produce the finished version of the package. Also, G.F. Strong Centre is currently re-evaluating it's role as

community educator and, until this mandate is revised and announced, the community education service will not be proceeding.

Despite the fact that this program has not yet been implemented some suggestions can be made for future program evaluation. Studies agree that pre-implementation statistics and post-implementation statistics are key to assessing the success of an education program of the nature of this thesis (Morris, 1984; LeBourdais, 1987). The suggested statistics which are useful in assessing the impact of such programs include type, mechanism, severity and incidence of injuries, amount of work days lost and worker's compensation costs. Comparisons of pre and post implementation statistics can provide a test of the programs impact.

As well, a number of checks can be built into this thesis which would provide ongoing evaluation. Melton (1983), Morris (1984) and LeBourdais (1987) all suggest that follow-up after the initial education phase is useful in ensuring effective and ongoing application of the skills learned in the initial stages of the program. The following is a sample schedule which could be implemented with this thesis.

1. Presentation of chosen modules for client group.
2. Six month review of modules on site.
3. Refresher course one year after six month review.

The on site review would consist of student evaluation on the job site. At the six month review and at subsequent refresher courses

retention of learned skills could be checked against the objectives outlined at the start of each module. At the end of the initial presentation of chosen modules and at the completion of each refresher course students would be asked to fill out a course evaluation rating effectiveness of content, presentation and relevance to perceived needs. As well as this, a number of exercises have been built into each module which provide the instructor with the opportunity to assess each students mastery of the module. This would involve return demonstration and written and oral participation during the class which will be assessed by the instructor. Guidelines are included which will assist the instructor in this assessment.

A final component which could be imbedded into this program is the addition of specially trained core members of staff who would act as resource people, onsite instructors and role models for fellow workers. These individuals would receive ongoing education in injury prevention techniques and would be responsible for expertise in the unique needs of their specific work area. They would also be responsible for ensuring that co-workers are effectively executing learned techniques and would intervene with suggestions and demonstrations as the need arose.

CONCLUSION

Because of the level of expertise in the specialty areas at the G.F. Strong Centre, the community has requested that the Centre be placed in the position of educator. In answer to this external pressure and in keeping with the Centres commitment to the community and its needs (especially in regards to the needs to the disabled members of the community) the G.F. Strong Centre has accepted the role of community educator. The challenge of providing theory and skills to the community had been met in a somewhat random manner, with the curriculum depending on the individual instructors. This left no opportunity for quality assurance in the area of inter-therapist curriculum content and further, in the area of meeting the specific needs of the clients in a repeatable manner. To solve this problem, the Physical Therapy Department decided to develop an education package, based on client/student needs, which would ensure specificity of content and inter-therapist/instructor repeatability.

Having looked at Tyler's four fundamental questions put forth in his book, Basic Principles of Curriculum and Instruction, an education package has been developed for the G.F. Strong Centre Physiotherapy Department. Tyler's Basic Principles of Curriculum and Instruction was chosen as the guide for developing this package because of its straightforward manner in addressing the foundation of curriculum. Successful provision of health education depends upon sound theory backed by a framework which ensures transfer of

this theory to the appropriate audience. Tyler provides this framework through his four fundamental questions. To begin with, he asks us to look at the educational purposes sought by the education providers. This package is based on the reported needs of the client learners and on the principles of proven back health techniques. As shown in this thesis, education of health care professionals and care-givers is an important component of successful and healthy service provision. Not only does the literature show this, but the demands of the community for this education reiterate this fact. Because of its modular format it will be amenable to custom tailoring for each group of students that it addresses and it will also allow for specificity in lesson content for the student which will not vary between instructors. Secondly, Tyler asks us to determine what are the educational experiences which will best achieve the designated objectives. The format of this education package is unstructured enough to allow for instructor creativity and professional discretion in the choice of learning experiences. However, because of the input from the potential learners in the community, learning experiences were chosen which not only impart knowledge but also give the opportunity for practice of learned techniques and opportunity to apply the curriculum to actual scenarios encountered by the learners. Tyler then asks us to investigate the organization of the curriculum into an effective format. As mentioned earlier, the package is modular in design and emphasizes mastery learning. This allows the learners to select only that curriculum which is

pertinent to their situation, thereby fulfilling their specific needs. The guidelines regarding prerequisites for the various modules are in place to ensure that continuity and integration of learning takes place.

Finally, Tyler looks at program evaluation. Although this is a critical portion of curriculum and program implementation, as mentioned earlier, due to funding constraints, G.F. Strong Centre is unable to implement this program at this time. Some recommendations have been outlined which could be expanded into a formal evaluation process when appropriate. The relevance of pre and post-implementation statistical analysis is supported by the literature and the introduction of ongoing, on site evaluation in the form of specially trained staff who act as resources and role-models for good technique is also recommended. Comparing the present education package to the previous, non-structured format of community education practised by the Physical Therapy Department, a few comments can be made. Prior to this education package, the Physical Therapy Department had no way of ensuring that the information taught by their therapists was consistent from lesson to lesson or that all the pertinent theory was conveyed to the students. Some therapists on staff have more experience than others and, by providing the curriculum for the staff, there will be no opportunity for inadequate knowledge transfer. However, as mentioned previously, the format is unstructured enough to allow for professional judgement and creativity.

PRACTICAL SKILLS FOR SAFE AND EFFECTIVE HANDLING OF PATIENTS AND CLIENTS

A MODULAR EDUCATION PACKAGE

TEACHING GUIDE

TEACHING SUGGESTIONS

When teaching students remember:

1. Give students the opportunity to practice the kinds of behaviour outlined in the objectives.

2. Desire student learning which is within the range of possibility for your students.

3. Realize that many experiences can be used to obtain the same educational objectives.

4. Acknowledge that a learning experience will usually bring about several outcomes.

5. Ensure that students understand the outlined objectives.

6. Allow for a variety of approaches and styles in learning and teaching.

7. Facilitate transfer of skills from one area to another.

8. Acknowledge that the desired learning must be pertinent to the students needs.

9. Be well organized.

Prerequisites:	Module Six An Approved Back Education Course

TOPIC: MODULE ONE: WHEELCHAIRS

Introduction:

The goal of this module is to promote efficient and safe handling of wheelchairs. A key to achieving this goal is familiarity and understanding with and of wheelchairs and their components. This module will introduce learners to the components of wheelchairs, the handling of these components and the handling of the chairs themselves.

Instructors are provided with the module content, master copies for handouts as well as suggested methods for transferring module content to the learners effectively.

Objective	Content	Suggested Methods	Time
1. Ability to identify the components of the described wheelchairs	**refer to:** * Description p. 68,75,80 *Parts of the Described Wheel Chairs p. as above	* ask students what chairs they are familiar with * disassemble chairs & identify components & fx *component exercise (see Appendix A)	5 m 20 m 20 m
2. Ability to disassemble & store the described wheelchairs.	**refer to:** * Disassembly & Storage p.72,78,82	* demonstrate disassembly & assembly * allow students to do * as/disassembly relay (see Appendix A)	10 m 15 m 10 m
3. Ability to maintain each each of the described wheelchairs.	**refer to:** * Maintenance p.74,79,83	* ask students for their own experiences/suggestions * present the maintenance checklist * provide practice opp.	5 m 15 m 10 m

Objective	Resources/Materials	Evaluation
all	1. 1 manual wheel chair/ 1-2 learners 2. 1 electric chair/2 learners 3. 1 scooter/class 4. 1 overhead projector	1. teacher/workshop evaluation (see Appendix B) 2. Successful demonstration of stated minimum competency
object. 1	1. overheads of wheelchair types 2. overhead of armrest styles 3. one leg strap (H)	1. Initial class discussion regarding previous wheelchair knowledge 2. Identification exercise (App. A) 3. Successful demonstration of stated minimum competency
object. 2	1. overheads of disassembly checklist 2. loading videotapes	1. accuracy of as/disassembly relay. 2. Successful demonstration of stated minimum competency
object. 3	1. overhead of maintenance table 2. clean rags 3. air pressure gauge 4. WD40 or similar lubricant	1. Initial class discussion regarding previous wheelchair knowledge 2. Instructor feedback throughout practice of maintenance skills

Prerequisites:	Module One Module Six

TOPIC: MODULE TWO: WHEELCHAIR PORTERING

Introduction:

The goal of this module is to promote efficient and safe handling of wheelchairs. A key to achieving this goal is familiarity and understanding with and of wheelchairs, their components and how they move. This module will introduce learners to the handling of wheelchairs.

Instructors are provided with the module content, master copies for handouts as well as suggested methods for transferring this content to the learners effectively.

Objective	Content	Suggested Methods	Time
1. Ability to employ safe & efficient means of portring a client found in the variety of wheeled mobility aides described in this module	**refer to:** *manual, electric, scooter portering p. 84-94	*ask students what their familiarity/needs with/for portering are *demonstrate portering techniques as outlined in the module *student exercise 1 *student exercise 2 *student exercise 3 **(for exercises see Appendix C)**	5 m 60 m 35 m
2. Ability to assess a situation for safe & appropriate portering intervention	**refer to:** *manual, electric, scooter safety checklists p. 85,87,92	*review the safety checklists for manual, electric and scooters *present students with case histories (see Appendix C) or use a hx suggested by a student	10 m 10 m

Objective	Resources/Materials	Evaluation
all	1. 1 manual wheelchair/ 1-2 learners 2. One electric wheelchair/ 2 learners 3. One scooter/class 4. One overhead projector	1. teacher/workshop evaluation (see Appendix E) 2. *Successful demonstration of stated minimum competencies.
object. 1	1. 3 cones 2. 1 blindfold/2 learners 3. Overheads of portering techniques	1. Initial class discussion regarding previous knowledge/experience with portering 2. Exercise 1-3 3. *
object. 2	1. overheads of safety checklists	1. Participation/problem solving skills in case hx 2. *

Prerequisites:	Module Six An Approved Back Education Course

TOPIC: MODULE THREE: TRANSFERS

Introduction:

The goal of this module is to promote efficient and safe handling of patients while performing transfers. This module will introduce learners to the principles of transfer skills with specific steps outlined for a series of designated transfers.

Instructors are provided with the module content, master copies for handouts as well as suggested methods for transferring this content to the learners effectively.

Objective	Content	Suggested Methods	Time
1. Ability to perform the outlined transfer techniques skillfully and safely	**refer to:** *standing pivot transfer p. 96-98 *sitting pivot transfer p.100-101 *two person lift p. 102-104 *car transfer p. 105-108	*ask students what techniques they are familiar with *demonstrate designated transfers *allow students to practice transfers with immediate feedback (see Appendix D)	5 m 40 m 45 m
2. Ability to assess a situation to determine the most appropriate & safe transfer technique	**refer to:** *safety checklist p.99,100 102-104 *module 6 as required p. 115-120	*review safety checklist *ask for transfer problems encountered by students...class problem solving *present case histories followed by class problem solving and demonstration (Appendix E)	5 m 40 m 45 m

Objective	Resources/Materials	Evaluation
all	1. One transfer belt/ student 2. One sliding board/ student 3. One wheelchair/student 4. One overhead projector	1. teacher/workshop evaluation (see Appendix B) 2. Successful demonstration of stated minimum competencies.
object. 1	1.Overheads of techniques	1. Initial class discussion 2. Immediate feedback throughout redemonstration. 3. Successful demonstration of stated minimum competencies.
object. 2	1. Overheads of case hx	1. Evaluation of particpation during case histories. 2. Successful demonstration of stated minimum competencies.

Prerequisites:	Module Six An Approved Back Education Course

TOPIC: MODULE FOUR: POSITIONING IN THE CHAIR

Introduction:

The goal of this module is to promote efficient and safe handling of patients while assisting in positioning in the chair transfers. This module will introduce learners to the principles of repositioning the patient in their chair with specific steps outlined for a series of designated movements.

Instructors are provided with the module content, master copies for handouts as well as suggested methods for transferring this content to the learners effectively.

Objective	Content	Suggested Methods	Time
1. Ability to assess the position status of a client in their chair.	**refer to:** *seating position p.110	*illustrate proper positioning in a chair *demonstrate inappropriate positioning (use student model)	10 m
2. Ability to execute repositioning techniques safely & efficiently	**refer to:** *Positioning: *Back into chair *Forward in chair *Sideways p. 110-111	*demonstrate techniques as outlined in the module *allow students to practice techniques with immediate feedback (see Appendix F)	10 m 20 m
3. Ability to choose the appropriate technique for repositioning the client in the chair	**refer to:** *review checklist p. 112	*present "models" to students and ask them to reposition the client. Work can be done as a group or in groups of 2-3 with immediate feedback (see Appendix F)	20 m

Objective	Resources/Materials	Evaluation
all	1. one wheelchair for every two students 2. overhead projector	1. teacher/workshop evaluation
object.1	1. Overhead A	1. Redemonstration/ feedback
object. 2	1. Overheads B & C	1. Evaluation of problem solving skills

Prerequisites:	Module Six An Approved Back Education Course

TOPIC: MODULE FIVE: POSITIONING IN THE BED

Introduction:

The goal of this module is to promote efficient and safe handling of patients while assisting in positioning in the bed. This module will introduce learners to the principles of repositioning the patient in their bed with specific steps outlined for a series of designated movements.

Instructors are provided with the module content, master copies for handouts as well as suggested methods for transferring this content to the learners effectively.

Objective	Content	Suggested Methods	Time
1. Ability to choose the appropriate technique for repositioning the client in their bed.	refer to: *preparation p.114	*demonstrate proper positioning in a bed *review safety check list *dialogue with learners about experiences they have had	20 m
2. Ability to execute the technique safely and efficiently.	refer to: *positioning p. 114	*demonstrate techniques as outlined in the module *allow students to practice technique with immediate feedback (see Appendix G)	10 m 30 m

Objective	Resources/Materials	Evaluation

all		1. Teacher/workshop evaluation
object. 1	1. Overhead of safety checklist.	1. Immediate instructor feedback
object. 2	1. Appendix G 2. One bed/2 learners 3. One draw sheet/2 learners	1. Teacher/workshop evaluation 2. Immediate instructor feedback

Prerequisites: None

TOPIC: MODULE SIX: INTRODUCTION TO DISABILITY

Introduction:

The goal of this module is to promote a greater understanding of the sequelae and ramifications of injury and disease in regards to transfers and portering. The key to safety in patient handling lies not only in adherence to outlined protocols but also in an understanding of the patient as a whole. This module will assist in completing this picture.

Instructors are provided with the module content, master copies for handouts as well as suggested methods for transferring this content to the learners effectively.

Objective	Content	Suggested Methods	Time
1. Ability to identify some of the secondary effects of a variety of diseases and injuries to the body	**refer to:** *side-effects graph p.120	*ask students what their familiarity with these sequelae are Dialogue,no evaluation (refer to exercise worksheet, appendix H)	15 m
2. Ability to utilize a variety of coping strategies to overcome the limitations that these sequelae may impose on interaction with clients	**refer to:** definitions p. 116-119	*present the definitions as outlined in the manual. *present case histories and initiate dialogue (Appendix H)	30 m 45 m

Objective	Resources/Materials	Evaluation
all	1. Overhead projector 2. Leg bag	1. teacher\workshop evaluation 2. successful demonstration of stated minimum comptencies
objective 1	as above	1. Exercise Worksheet
objective 2	as above	1. Case Histories Immediate instructor feedback

APPENDIX A

WHEELCHAIR COMPONENT EXERCISE

1. Which wheelchair component prevents backwards tipping of the chair? _____

2. Identify three different types of armrests which you might encounter._____.

3. Describe the different types of wheelchair frames and their functions._____.

4. What are castor pin locks?_____

5. Explain the purpose of grade aides._____

6. Identify the following items on the wheelchair.

-brakes	-castor pin locks
-arm rests	-grade aides
-castor wheels	-push handles
-seat sling	-leg rests

MINIMUM COMPETENCY

The student shall correctly answer questions one through five and shall correctly identify brakes, leg rests, push handles and castor wheels.

WHEELCHAIR ASSEMBLE/DISASSEMBLY RELAY

Break students into teams of two. Each team shares one wheelchair. One the count of three, the team is instructed to disassemble the wheelchair. The first team to disassemble the wheelchair wins.

Teams shall then shift to another wheelchair (which is now disassembled from the previous relay) and, on the count of three, the team shall commence to assemble the wheelchair. The first team to accurately assemble the wheelchair wins.

MINIMUM COMPETENCY

The student shall accurately assemble and disassemble the wheelchairs by the end of these exercises. **Speed is not a criteria.**

APPENDIX B

TEACHER/WORKSHOP EVALUATION

Please assess each question on the provided scale and answer as thoroughly as possible. Your feedback will help us to make this a better workshop.

1. Did this workshop present you with objectives appropriate to your needs?

very appropriate	moderately appropriate	not appropriate

If not, what objectives should have been presented?

2. Was the equipment used appropriate and sufficient?

very appropriate	moderately appropriate	not appropriate

If not, what would improve equipment use? If yes, what was most effective?

3. Was the workshop facilitators presentation effective?

very effective	moderately effective	not effective

If not, how could the presentation be improved? If yes, what was most useful about the presentation style?

4. Was their adequate time allowed for this module?

adequate	moderately adequate	not adequate

If not, how much time should be allotted for this module?

5. Did you achieve the objectives stated at the beginning of this module?

all	25%	50%	75%	none

Explain why those objectives were not achieved.

APPENDIX C

STUDENT EXERCISES: WHEELCHAIR PORTERING

STUDENT EXERCISE ONE

Part A

1. Split students into teams of two.
2. Assign one wheelchair and one blindfold to each team.
3. Instruct one of the students to don the blindfold and seat themself in the wheelchair. The other student assumes the role of porter.
4. The porter then pushes the wheelchair and rider around a set course (such as a circular loop in the hallway) and is instructed to change direction and speed without warning.
5. After 2-5 minutes the students should reverse roles.

MINIMUM COMPETENCY

1. Ability to safely propel wheelchair without tipping chair or causing rider to fall out of chair.

Part B

1. As for steps 1-2 in Part A.
2. Instruct one of the students to don the blindfold and assume the role of porter. The other student is seated in the wheelchair.
3. The blindfolded porter, under the verbal direction of the seated partner, proceeds to negotiate a set course (as described in Part A).
4. After 2-5 minutes the students should reverse roles.

MINIMUM COMPETENCY

1. Ability to safely propel wheelchair without tipping chair or causing rider to fall out of chair.

CONCLUSION

Upon completing the above assigned tasks the teams shall convene and, under the guidance of the instructor, discuss their reactions to the exercise.

STUDENT EXERCISE TWO

1. Prepare a set course which provides a variety of terrain for wheelchairs to negotiate (inclines, declines curbs, carpet, linoleum, gravel, grass, bumpy pavement)
2. Split students into teams of two.
3. Assign one wheelchair to each team.
4. Instruct one of the students to assume the role of porter. The other student is seated in the wheelchair.
5. The porter is asked to push the wheelchair and rider around the designated course.
6. After 2-5 minutes the students should reverse roles.

MINIMUM COMPETENCY

1. Ability to safely propel wheelchair without tipping chair or causing rider to fall out of chair.

CONCLUSION

Upon completing the above assigned tasks the teams shall convene and, under the guidance of the instructor, discuss their reactions to the exercise.

STUDENT EXERCISE THREE

1. Prepare a set course with three cones set in a straight line with a scooter length between cones.
2. Split students into teams of two.
3. Assign one scooter to each team.
4. Instruct one of the students to assume the role of porter. The other student is seated in the scooter.
5. The porter is asked to push the scooter and rider around the designated course.
6. After 2-5 minutes the students should reverse roles.

MINIMUM COMPETENCY

1. Ability to safely propel scooter without tipping chair or causing rider to fall out of chair.

CONCLUSION

Upon completing the above assigned tasks the teams shall convene and, under the guidance of the instructor, discuss their reactions to the exercise.

EVALUATION FOR EXERCISES ONE THROUGH THREE

1. Immediate instructor feedback throughout exercise.
2. Instructor feedback during concluding portions of exercises.
3. Demonstrate minimum competencies as outlined.

APPENDIX C

CASE HISTORY: PORTERING

A

A client waiting for pickup (Handidart or facility van) is found waiting on the sidewalk in front of their house in their scooter. There are multiple cars parked along the sidewalk making curbside pickup impossible. The client and scooter must be brought to van parked in the road. Please recommend appropriate portering techniques.

MINIMUM COMPETENCIES

The instructor should look for these responses:

1. Ask the client if they can manipulate the scooter themselves in this situation or if they wish assistance.

2. Scooters should only drive over curbs of very low height (no more than two inches) so look for a curb cut and access the road at that point. Always ensure that there is no traffic.

3. Adherence to recommended portering techniques should be cross-checked with suggested methods in the module.

B

Client (who is using a wheelchair) requests assistance while on shopping trip. In order to access dressing room assistant and client must negotiate a cluttered showroom with racks of clothing. Upon arrival at dressing room area, the doorway into the area is found to be slightly too narrow. Please assist client to the dressing room area.

MINIMUM COMPETENCIES

The instructor should look for these responses:

1. Ask the client if they can manipulate the wheelchair themselves in this situation or if they wish assistance.

2. Find the widest possible route to the dressing room area to avoid injuring client or damaging wares.

3. To access dressing room area, ensure that anti-tip tubes are down, remove wheels of chair, push chair through doorway, replace wheels. Ensure that client is agreeable with this procedure prior to attempting it.

APPENDIX D

TRANSFERS: STUDENT PRACTICE

For this component of Module Three, break the class up into groups of three. One student will act as the patient and the other two students will demonstrate the assigned transfer technique or, where only one person is required for the transfer, the second person will observe and give suggestions at the end of the transfer.

At the completion of the assigned transfers, students will rotate until each student has acted as patient.

MINIMUM COMPETENCIES

1. Adherence to the appropriate safety checklist for the assigned transfer.
2. Adherence to the transfer guidelines as outlined in the module with minor omissions (not including items on the safety check list)

APPENDIX E

CASE HISTORIES

A

You are on an outing with members of the wheelchair rugby team and several other volunteers. One of the team members, a gentleman presenting with quadriplegia, falls out of his chair while wheeling over a curb. Ensure that this gentleman returns to his chair. **(If students ask: this client has partial use of upper extremities).**

MINIMUM COMPETENCIES

1. Students should ask what abilities this gentleman exhibits)
2. Choose the Maximally Dependent Lift (p.67).
3. Follow the review checklist as outlined.
4. Always ask the gentleman what he wishes you to do to assist him.

B

You have just started your shift and are assigned to assist patient X out of bed. This patient has recently experienced a CVA. One staff has called in sick and one staff is away on holidays. There is a staff meeting in half an hour which you **have** to be there.
(If the students ask: this client weightbears through the left side of the body but has been known to be unreliable.)

MINIMUM COMPETENCIES

1. Students should choose a two person lift only. If a one person lift is chosen, student will require review of safety checklist.
2. Choose the Maximally Dependent Lift (p.67).(or mechanical lift)
3. Follow the review checklist as outlined.
4. Adherence to the transfer guidelines as outlined in the module with minor omissions (not including items on the safety check list)

APPENDIX F

POSITIONING: STUDENT PRACTICE

For this component of Module Four, break the class up into groups of two. One student will act as the patient and the other will demonstrate the assigned transfer technique.

At the completion of the assigned positioning, students will rotate until each student has acted as patient.

MINIMUM COMPETENCIES

1. Adherence to the appropriate safety checklist for the assigned positioning.
2. Adherence to the transfer guidelines as outlined in the module with minor omissions (not including items on the safety checklist.

REPOSITIONING EXERCISE

A

Patient has slipped forwards in the chair. Please reposition.

B

Patient has slipped sideways in the chair. Please reposition.

C

Patient has slipped forwards and sideways. Please reposition.

MINIMUM COMPETENCIES

1. Adherence to the appropriate safety checklist for the assigned positioning.
2. Adherence to positioning guidelines as outlined in the module with minor omissions (not including items on the safety checklist.

APPENDIX G

BED POSITIONING: STUDENT PRACTICE

For this component of Module Five, break the class into groups of three. One student will act as the patient and the other two will demonstrate the assigned transfer technique.

At the completion of the assigned positioning, students will rotate until each student has acted as patient.

MINIMUM COMPETENCIES

1. Adherence to the appropriate safety checklist for the assigned positioning.
2. Adherence to the transfer guidelines as outlined in the module with minor omissions (not including items on the safety checklist.

APPENDIX H

CASE HISTORIES: MODULE SIX

A

You are participating in a recreation group outing to the movies. One of participants complains of feeling odd. He describes sweating and a splitting headache. What do you do.

MINIMUM COMPETENCY

1. Recline individual (tip back chair).
2. Empty leg bag and check for tubing kinks.
3. Notify a physician.

B

You are assisting a client onto the bus. He becomes verbally abusive.

MINIMUM COMPETENCY

1. Ensure the safety of the individual and yourself.
2. Do not react to the behaviour but let the individual know that this behaviour is inappropriate.

C

A client you are working with is unable to find the right words to communicate their needs. Words come out but they are out of context with the situation.

MINIMUM COMPETENCIES

1. Be clear in your communication with the client.
2. Do not rush the client or finish their sentences.
3. Look for alternate means of communication (bliss board, words in a newspaper, physical demonstration.

EXERCISE WORKSHEET

Identify the following and list conditions in which they may be found:

1. Autonomic Dysreflexia
2. Neglect
3. Decreased Balance
4. Incontinence
5. Spasticity
6. Decreased Bone Strength

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-disassembly and storage

-maintenance

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-description

-disassembly and storage

-maintenance

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-description

-disassembly and storage

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- safety check list
- inclines/declines
- curbs/stairs (2 person)

b) ELECTRIC

- manoeuvring
- safety check list
- inclines/curbs

c) SCOOTER

- manoeuvring
- safety check list
- inclines/declines

MODULE 3 TRANSFERS

PREREQUISITES: MODULE 1

a) STANDING TRANSFER

- Appropriate for clients who can weight bear fully or partially through one or two limbs

1) Standing Pivot Transfer
description: includes safety precautions and techniques

2) Half Standing Pivot Transfer
description: as for 1

b) SITTING PIVOT

- Appropriate for the fully dependent client

- Incorporates either full or partial assistance from one or two attendants

1) Sliding Board Transfer
description: includes safety precautions and techniques

2) Towel Transfer
description: includes safety precautions and techniques

3) Transfer Belt
description: includes safety precautions and techniques

c) Two Person Lifts

- Appropriate for the fully dependent client who is being transferred between surfaces of varying height or longer distances

1) Moderately Dependant Lift
description: includes safety precautions and techniques

2) Maximally Dependent Lift
description: includes safety precautions and techniques

d) Three Person Lift (bed to stretcher)

- Appropriate for the fully dependent client
- Description: includes safety precautions and techniques

e) Car Transfer

- Appropriate for the partially or fully dependent client
- Description: includes safety precautions and techniques for the following:
    1) Standing pivot - clients who can weight bear fully or partially through one or two limbs
    2) Sitting pivot - use of sliding board, partial/full client assist

All transfers incorporate either full or partial assistance from 1 or 2 attendants.

MODULE 4 POSITIONING IN THE CHAIR

PREREQUISITES: NONE

Appropriate techniques for improving the seating position of the fully or partially dependent client:

1) Backwards
2) Forwards
3) Sideways

MODULE 5 BED MOBILITY

PREREQUISITES: NONE

Safety precautions and techniques with full or partial assistance from 1 or 2 attendants.

MODULE 6 INTRODUCTION TO DISABILITY

PREREQUISITES: NONE

1) Spasticity
2) Muscle weakness
3) Decreased bone integrity
4) Decreased joint integrity
5) Impaired sensation
6) Impaired coordination
7) Impaired cognition
8) Impaired speech
9) Impaired vision
10) Incontinence

MODULE 1 WHEELCHAIRS

Goals

To promote efficient and safe handling of wheelchairs.

Objectives

The student will be able to:

1. Identify the five types of wheelchairs described in this module.

    - Manual Fold
    - Manual Rigid
    - Manual with Detachable Power Pack
    - Electronic - Conventional
    - Electronic - Scooter Type

2. Disassemble and stow each of the described wheelchairs appropriately and safely.

3. Maintain each of the above described chairs appropriately.

Equipment

1. One manual (assortment of rigid and folding) wheelchair for every one to two students.
2. One electric wheelchair for every two students.
3. One scooter for each class.
4. One overhead projector.
5. One leg strap.

MANUAL WHEELCHAIRS: DESCRIPTION

Average Weight: 8.55 --> 18 kg.
Average Overall Width: } very diverse
Average Overall length: } very diverse
Average Overall Height: } very diverse

Introduction: There are two categories of manual wheelchairs. The most common chair found in the institutional setting and at the lower end of performance is the manual fold chair. This chair is instantly recognizable by the "x" frame under the seat. The other category is that of the manual rigid chair. This is usually a higher performance chair and is rarely seen in the institutional setting. Rigid chairs do not have a "X" frame.

<<<**OVERHEAD OF BOTH TYPES**>>>

Parts Of The Manual Wheelchair:

Anti-tip Tubes: an extension of the tipping bar which projects beyond the tires. It may have wheels on the end. The purpose of this feature is to prevent accidental tipping backwards of the wheelchair. To facilitate attendant controlled tipping back of the chair the tubes may be released by pushing in a pin lock mechanism and rotating the tubes up and out of the way. This feature comes as a pair.

Armrests: Armrests vary in height and style and may be removable or fixed. The most common styles are desk style, standard or padded swing away and these may or may not be height adjustable. Some armrests may have such features as arm cradles. To detach, release pin lock, if present, then pull straight up at the centre of the arm rest. Removal of armrests may facilitate transfers or allow wheelchair positioning under a table. This feature comes as a pair.

<<<**OVERHEAD OF DIFFERENT STYLES**>>>

Axles: axles vary in style depending on the intended use. However, one of the most useful styles of axle is that of the quick release axle. This type of axle allows the user or attendant to quickly remove the wheels in order to facilitate easier storage, cleaning and repair. Although individual models display slight variations, the method of operation remains constant throughout. Pressing the plunger on the end of the axle releases two ball

bearings from the extended position and allows the axle and wheel to be withdrawn from the mounting plate. When replacing the wheel, care should be taken to ensure that the plunger returns to its fully extended position. Failure to do this may result in the wheel coming off during use.

Brakes: brakes vary in style but most institutional chairs have either push or pull style brakes. Almost all brakes work by exerting a frictional force on the rear tire. This is achieved by moving the brake operating lever either forwards or backwards to place the friction bar in it's locked position in contact with the tire. To release the brakes, the friction bar must be removed from contact with the tire. This is opposite to the action of applying the brakes.

Castor wheels: castor wheels are the smaller set of wheels at the front of the wheelchair. Castor wheels are available in a variety of styles and materials. Castors can be either pneumatic or solid rubber or plastic. Sizes vary from three to eight inches.

Castor Pin Locks: castor pin locks consist of a plate on the wheel stem of the castor wheel. This plate has a hole in it for the location of a retractable pin which is connected to the frame. When applied the castor lock stabilizes the chair when parked or keeps it rolling in a straight direction when wheeling.

Cushions: cushions come in a great variety of shapes and materials. They may be foam, air, gel or any combination of the three. In most cases cushions are easily removed from the wheelchair and may be secured to the wheelchair seat by velcro or straps.

Frame: the frame is the skeleton of the wheelchair. All other components of the wheelchair are supported by the frame. Depending on the type of wheelchair and its intended use, the frame can be made from a great variety of metal alloys. There are two basic designs of frame, rigid and folding. These have been described in the introduction to this module.

Grade Aides: also known as "Hill Climbers", grade aids are small toothed cams mounted next to the brake. They are used to stop the chair from rolling backwards when the user is going up a hill. During normal use of the wheelchair, they are positioned out of the way. They may be accidentally applied, making it very difficult to wheel backwards. To release, rotate away from the tire until they click into the locked position.

Handrims: handrims are metal rims which are found around the circumference of both wheels on the chair. They are sometimes referred to as push rims as this is the component of the chair with which the wheelchair uses propels the wheels. They are made of either anodized metal or steel and may be plastic or foam coated.

The rims may also have projections which are used by the wheelchair user to assist in propulsion of the wheelchair.

Leg rests: leg rests come in a variety of styles. They may be fixed, swing-away or elevating. Fixed leg rests are welded to the frame. Swing-away leg rests are mounted on brackets at the front of the frame and possess a built in locking mechanism which locks automatically when the leg rests are in the correct position. There are a variety of means of unlocking this mechanism and this should be investigated with each individual chair. Elevating leg rests are identifiable by a high goose neck at knee height and the presence of a calf pad. The locking mechanism is situated at the side of the goose neck and allows the leg rest to be raised to the desired height, then automatically locks it into position. To release, the operation lever has to be pushed or pulled while weight is removed from the locking mechanism. Footplates are found at the terminal end of the leg rest. Rigid wheelchairs may have fixed footplates. All other wheelchairs have flip up footplates to facilitate folding or to provide room for the wheelchair user to stand up between.

Leg Straps: leg straps are canvas straps which may be found spanning the leg rests of the wheelchair. They are usually in the shape of an H and prevent the wheelchair user's legs from slipping off of the leg rests.

<u>**<<<sample leg strap>>>**</u>

Rear Wheels: the rear wheels of the wheelchair are the large wheels which support the bulk of the wheelchair and which provide the chairs means of movement. There are two basic tire types, pneumatic and solid. Pneumatic tires are identifiable by the inner tube inside the rim. Solid tires are advertised as maintenance free although, occasionally, they separate from the rim. There are wide variety of tire types available and these are chosen with the needs of the wheelchair user in mind.

Seat Back: the seat back of the wheelchair comes in a variety of shapes, dependent on the needs of the client. They can be height adjustable, they may be straight or come with a bend and they can be fixed or folding.

Seat Belts: seat belts come in a variety of styles. They can be auto style, buckle or velcro and may include a chest strap.

Seat Sling: the seat sling is that component of the wheelchair which supports the wheelchair user. It is usually made of a vinyl material and can be fixed, folding, soft or rigid.

Tipping Bars: This is an extension found on some wheelchairs at the back of the frame, about six inches from the floor and two inches from the rear wheel. It is used by the attendant to help tip the chair into the balance position.

Trays: wheelchair trays may be fixed to some wheelchair. The range in shape from a half tray to a full tray spanning the width of the wheelchair. They can be lifted out of the way by flipping them over to one side if they are a half tray or by pulling them forward and away from the chair (many are fixed through a tongue and groove mechanism). Some trays may be further fastened to the wheelchair with straps.

Wheelchair Bag: the wheelchair bag is a bag, soft or rigid, which is attached to the back of the wheelchair and is used to store items which the wheelchair user may need on a daily basis.

MANUAL WHEELCHAIRS: DISASSEMBLY AND STORAGE

Note: Manual wheelchairs can be broken down to smaller units for storage. When lifting manual wheelchairs ensure that they have been maximally disassembled.

DISASSEMBLY CHECKLIST			
Wheelchair component	**Removed**	**Stored**	**Task Completion**
armrests (2)			
rear wheels (2)			
legrests (2)			
cushion (1)			

Folding the Wheelchair

1. Remove cushion
2. Flip up footplates.
3. Stand behind the wheelchair.
4. Tilt the chair to one side so that it is balanced on one wheel and one caster.
5. Pull up on loop at the edge of the seat or grasp the seat sling in the centre and pull upwards.

Unfolding the Wheelchair

1. Stand behind the chair.
2. Tip the chair to one side so that it is balanced on one wheel and one caster.
3. Push down on the lower side of the seat frame while keeping the chair tipped.
4. Replace cushion.
5. Apply brakes.

Loading the Wheelchair Into a Car

A wheelchair is stowed in one of two places: behind the passenger seat or in the trunk. Whichever spot is chosen, the chair must first be made as compact and light as possible.

BEHIND THE PASSENGER SEAT

1. Move passenger seat forward.
2. Remove cushion and wheelchair bag and place in back seat.
3. Position the chair perpendicular to the car in line with the space behind the passenger seat.
4. Tip the chair back into the balance position.
5. Roll the chair forward until the caster wheels are inside.
6. Push the chair forwards and up so that the rear wheels climb up the sill and into the space behind the passenger seat.
7. Reposition the passenger seat.
8. Gently close the door to make sure the chair is in. Never put items that have been removed from the chair on the car roof. as they are likely to be left behind.

IN THE CAR TRUNK

1. Position chair close to and parallel with the trunk.
2. Apply brakes.
3. Bend your knees and keep your back straight.
4. Lift chair holding onto wheel and frame.
5. Rotate chair around the edge of the trunk.
6. Slide into position in the trunk.

<<<practice disassembling chairs and reassembling them>>>

<<<equipment: 1 chair/ student>>>

Manual Wheelchair: Maintenance

MAINTENANCE	
Wheelchair Component	Directions
Soft Components: seat sling seat back arm rest	Vinyl does not require upkeep; however, a vinyl compound such as Armourall can be used for cleaning and maintenance.
Frame	Frame can be wiped clean with a damp or dry cloth. Chrome can be waxed for added protection.
Pneumatic Tires	Tires should be checked once per month. The air pressure can be found on the rim wall.
Axles	Axles should be wiped clean with a lubricated cloth every one to two months.

ELECTRIC WHEELCHAIRS: **DESCRIPTION**

Average weight 55.5 kg to 110 kg
Overall average width 58 cm to 66 cm
Overall average length 118 cm to 84 cm
Overall average height 93 cm to 99 cm

Introduction: the variety of electric wheelchairs available on the market is too great to discuss within the scope of this lesson. However, to simplify matters, electric wheelchairs can be divided into the following three categories.

1. Standard
   - seating system and power units are part of one system
   - conventional electric chairs have two motors, batteries and circuitry situated below the seat. These chairs are generally heavier and usually have wide mid-size tires.

2. Manual Wheelchair With a Power Pack
   - are usually folding type chairs.
   - the power pack is situated on top of the rear wheels.
   - there are two battery boxes situated below the seat.
   - the power pack and the batteries can be removed quickly.

3. Powerbase
   - modular base incorporating batteries and frame seating system is completely separate from the base thereby allowing seat to be changed if necessary
   - large thick rear and front wheels lead to increased manoeuvrability over a greater variety of terrain
   - look may be considered less clinical

Parts of the Electric Wheelchair:

Armrests: Armrests vary in height and style and may be removable or fixed. The most common styles are desk style, standard or padded swing away and these may or may not be height adjustable. Some armrests may have such features as arm cradles. To detach, release pin lock, if present, then pull straight up at the centre of the arm rest. Removal of armrests may facilitate transfers or allow wheelchair positioning under a table. This feature comes as a pair.

<<<**OVERHEAD OF DIFFERENT STYLES**>>>

Batteries: batteries will either come in the form of gel cells or lead acid cells. Gel cells are more expensive than lead acid cells but are lower maintenance. Batteries are most commonly located at the back of the wheelchair below the seat.

Brakes: brakes vary in style but most institutional chairs have either push or pull style brakes or dynamic or electromagnetic brakes which lock as soon as the power has been turned off. . Almost all parking brakes work by exerting a frictional force on the rear tire. This is achieved by moving the brake operating lever either forwards or backwards to place the friction bar in it's locked position in contact with the tire. To release the brakes, the friction bar must be removed from contact with the tire. This is opposite to the action of applying the brakes. Some of the more upscale electric wheelchairs will have brakes which lock as soon as the power has been turned off.

Castor wheels: castor wheels are the smaller set of wheels at the front of the wheelchair. Castor wheels are available in a variety of styles and materials. Castors can be either pneumatic or solid rubber or plastic. Sizes vary from three to eight inches.

Castor Pin Locks: castor pin locks consist of a plate on the wheel stem of the castor wheel. This plate has a hole in it for the location of a retractable pin which is connected to the frame. When applied the castor lock stabilizes the chair when parked or keeps it rolling in a straight direction when wheeling.

Clutch: the clutch release lever on electric wheelchairs can usually be found near and just behind the brake lever. Locating this lever becomes very important when portering someone in an electric wheelchair (as will be discussed in Module 2).

Control Box: the control box is usually located on the armrest of the wheelchair users dominant side. Occasionally it is fixed on a post which crosses over the lap the user. Control boxes may be rigidly fixed, removable or swing away.

Cushions: cushions come in a great variety of shapes and materials. They may be foam, air, gel or any combination of the three. In most cases cushions are easily removed from the wheelchair and may be secured to the wheelchair seat by velcro or straps.

Frame: the frame is the skeleton of the wheelchair. All other components of the wheelchair are supported by the frame. Depending on the type of wheelchair and its intended use, the frame can be made from a great variety of metal alloys. Depending on the type of electric wheelchair being used, the shape of the frame can vary greatly. Manual wheelchairs which are fitted with a power pack usually tend to be of the folding style.

Leg rests: leg rests come in a variety of styles. They may be fixed, swing-away or elevating. Fixed leg rests are welded to the frame. Swing-away leg rests are mounted on brackets at the front of the frame and possess a built in locking mechanism which locks

automatically when the leg rests are in the correct position. There are a variety of means of unlocking this mechanism and this should be investigated with each individual chair. Elevating leg rests are identifiable by a high goose neck at knee height and the presence of a calf pad. The locking mechanism is situated at the side of the goose neck and allows the leg rest to be raised to the desired height, then automatically locks it into position. To release, the operation lever has to be pushed or pulled while weight is removed from the locking mechanism. Footplates are found at the terminal end of the leg rest. Most wheelchairs have flip up footplates to provide room for the wheelchair user to stand up.

Leg Straps: leg straps are canvas straps which may be found spanning the leg rests of the wheelchair. They are usually in the shape of an H and prevent the wheelchair user's legs from slipping off of the leg rests. **<<<sample leg strap>>>**

Rear Wheels: the rear wheels of the wheelchair are the large wheels which support the bulk of the wheelchair and which provide the chairs means of movement. There are two basic tire types, pneumatic and solid. Pneumatic tires are identifiable by the inner tube inside the rim. Solid tires are advertised as maintenance free although, occasionally, they separate from the rim. There are wide variety of tire types available and these are chosen with the needs of the wheelchair user in mind.

Seat Back: the seat back of the wheelchair comes in a variety of shapes, dependent on the needs of the client. They can be height adjustable, they may be straight or come with a bend.

Seat Belts: seat belts come in a variety of styles. They can be auto style, buckle or velcro and may include a chest strap.

Seat Sling: the seat sling is that component of the wheelchair which supports the wheelchair user. It is usually made of a vinyl material and can be fixed, folding, soft or rigid.

Trays: wheelchair trays may be fixed to some wheelchair. The range in shape from a half tray to a full tray spanning the width of the wheelchair. They can be lifted out of the way by flipping them over to one side if they are a half tray or by pulling them forward and away from the chair (many are fixed through a tongue and groove mechanism). Some trays may be further fastened to the wheelchair with straps.

Wheelchair Bag: the wheelchair bag is a bag, soft or rigid, which is attached to the back of the wheelchair and is used to store items which the wheelchair user may need on a daily basis.

ELECTRIC WHEELCHAIRS: DISASSEMBLY/STORAGE

Note: Electric wheelchairs can weigh from 55.5 kg to 11 kg, therefore even after removing all free components it may not be possible to manually lift an electric wheel chair into a trunk or car. To store an electric chair one should consider a lift and/or van.

DISASSEMBLY CHECKLIST			
Wheelchair component	**Removed**	**Stored**	**Task Completion**
armrests (2)			
legrests (2)			
lap tray (1)			
batteries			
control box			
cushion			

videotape of chair being loaded into van
overhead of disassembled chair
one electric wheelchair

ELECTRIC WHEELCHAIRS: MAINTENANCE

MAINTENANCE	
Soft Components: seat sling seat back arm rest	Vinyl does not require upkeep; however, a vinyl compound such as Armourall can be used for cleaning and maintenance.
Frame	Frame can be wiped clean with a damp or dry cloth. Chrome can be waxed for added protection.
Pneumatic Tires	Tires should be checked once per month. The air pressure can be found on the rim wall.
Axles	Axles should be wiped clean with a lubricated cloth every one to two months.
Batteries: Gel Cell	Gel Cells are relatively low maintenance. Most people recharge them every day. Gel Cells are weather proof.
Lead Acid Cell	Lead Acid Cells are higher maintenance than gel cells. It is necessary to add water every two to three months. Most people recharge them every day. They can not be taken on airplanes. Lead Acid Cells are weather proof. Lead Acid cells should not be tipped as the acid can spill out.
Both Types	Both types of cell have an internal memory so the range decreases with daily recharging. The batteries need to be entirely drained every six months. They both have a lifespan of approximately one year.

SCOOTERS: DESCRIPTION

average weight: 24 kg to 60 kg
average overall width: 45 cm to 61 cm
average overall length: 99 cm to 118 cm
average speed: 3 kph to 8.5 kph

Introduction: The variety of scooters on the market is too diverse to discuss within the scope of this lesson. Scooters are basically a wheeled platform with a seat and batteries at the back and steering mechanism at the front. Power is transmitted through either the front wheel or the back wheels, depending on the model. All scooters can be disassembled to some extent to facilitate transportation.

Parts of the Scooter:
Accessories: scooters come with a variety of accessories. Often they are outfitted with baskets at the front or back or pouches below the seat.

Armrests: Armrests vary in height and style and may be flip back or fixed. They may or may not be height adjustable. Some armrests may have such features as arm cradles. Flipping the armrests to their back position may facilitate transfers. This feature comes as a pair.

Batteries: batteries will either come in the form of gel cells or lead acid cells. Gel cells are more expensive than lead acid cells but are lower maintenance. Batteries are most commonly located at the back of the wheelchair below the seat.

Brakes: brakes vary in style but most scooters have either push or pull style parking brakes or dynamic or electromagnetic brakes which lock as soon as the power has been turned off. Almost all parking brakes work by exerting a frictional force on the rear tire. This is achieved by moving the brake operating lever either forwards or backwards to place the friction bar in it's locked position in contact with the tire. To release the brakes, the friction bar must be removed from contact with the tire. This is opposite to the action of applying the brakes.

Controls: controls are found on the tiller of the scooter which is located at the front of the scooter. Controls often have a switch to determine different ranges of speeds, a horn and a battery level indicator.

Clutch: the clutch release lever on scooters can usually be found near and just behind the brake lever. Locating this lever becomes very important when moving a scooter as it increases the ease with which the scooter can be pushed (as will be discussed in Module 2).

Power Switch: the power switch is located either at the back of the scooter base or at the front (sometimes on the control panel).
Seat: the scooter seat can vary in style but is usually a modular unit which is cushioned. It usually has a swivel feature allowing the seat to be facing either forwards for driving or off to the side for transfers.

Seat Swivel Lever: this lever allows the scooter user to lock the chair into the desired position or to release it for movement. It can be found under the seat, often at the side.

Tiller: the tiller is located at the front of the scooter, within easy reach of the scooter user. The tiller is used to direct the scooter and often holds the control panel. It may be adjustable.

Wheelbase: the wheelbase is the component of the scooter upon which the other components rest or attach to. The base also serves as a footboard for the user. The wheelbase may be length adjustable or rigid.

SCOOTERS: DISASSEMBLY\STORAGE

Note: Scooters can weigh from 24 kg to 60 kg. It is important to disassemble the scooter as much as possible prior to loading it into a car or car trunk. Not all scooters can be broken down into small enough components to make car trunk storage possible. Special lifts, ramps and trailers can be used for larger scooters.

DISASSEMBLY CHECKLIST			
Scooter component	**Removed**	**Stored**	**Task Completion**
accessories			
batteries			
seat			
tiller			
front end			
back end			

Loading the Scooter Into a Car

1. Dismantle the chair.
2. Plan ahead where each piece is going to fit.
3. Rest one end of the base against the lip of the trunk.
4. Lift the other end and slide the unit into the trunk.
5. Lift the other pieces into the trunk, remembering to position the batteries in a position where they will not tip over.

<<<videotape of scooter being disassembled>>>
<<<videotape of trunk lift in operation>>>
<<<equipment: one scooter>>>

SCOOTERS: MAINTENANCE

MAINTENANCE	
Soft Components: seat back arm rest	Vinyl does not require upkeep; however, a vinyl compound such as Armourall can be used for cleaning and maintenance.
Wheel Base and Frame	Frame can be wiped clean with a damp or dry cloth. Chrome can be waxed for added protection.
Pneumatic Tires	Tires should be checked once per month. The air pressure can be found on the rim wall.
Axles	Axles should be wiped clean with a lubricated cloth every one to two months.
Batteries: Gel Cell	Gel Cells are relatively low maintenance. Most people recharge them every day. Gel Cells are weather proof.
Lead Acid Cell	Lead Acid Cells are higher maintenance than gel cells. It is necessary to add water every two to three months. Most people recharge them every day. They can not be taken on airplanes. Lead Acid Cells are weather proof. Lead Acid cells should not be tipped as the acid can spill out.
Both Types	Both types of cell have an internal memory so the range decreases with daily recharging. The batteries need to be entirely drained every six months. They both have a lifespan of approximately one year.

MODULE 2 WHEELCHAIR PORTERING

Goals

To promote efficient and safe handling of wheelchairs.

Objectives

The student will be able to:

1. Assess a situation for appropriate portering intervention.

2. Employ safe and efficient means of portering a client found in the variety of wheeled mobility aides described in this module:
   - electric wheelchair
   - scooter
   - manual wheelchair

Equipment

1. One manual (assortment of rigid and folding) wheelchair for every one to two students.
2. One electric wheelchair for every two students.
3. One scooter for each class.

MANUAL WHEELCHAIRS: Portering

Note: wheelchairs vary in design and weight as do wheelchair passengers. It is critical that the porter feel confident performing all required tasks.

Preparation

1. Introduce yourself and offer assistance. A wheelchair is part of the individual's personal space. This space should not be invaded without permission.
2. Ask the wheelchair user how you can help. If they have a preferred technique for completing the task defer to their instructions.
3. Once an approach has been chosen explain how you will go about completing it.
4. If a change of plan is required, inform the wheelchair user prior to initiating the change.
5. Confirm that the wheelchair user is seated safely, with feet on the legrests and clear of the wheels, arms and clothing clear of obstacles, seatbelt on if appropriate and all luggage secure.
6. Disengage brakes.

Action

1. Proceed with plan, as directed by the wheelchair user. If this is not an option proceed with the following:
2. Grasp the wheelchair push handles.
3. Your body should be as close as comfortably possible to the wheelchair.
4. Start pushing as smoothly as possible.
5. Ensure that the passenger is comfortable with your speed.
6. While moving, scan the ground ahead for hazards (potholes, uneven terrain, soft ground, bumps, puddles, mud, etc) and ensure that the passenger remains safely in the chair as does all luggage (watch for clothing rubbing on wheels, arms or legs catching on equipment).

Completion

1. Slow down smoothly.
2. Stop the chair with the casters in the forward position.
3. Apply brakes.
4. Inform the wheelchair passenger that you have arrived and, if no further assistance is required, you will now be leaving.

BALANCE POSITION: All wheelchairs can be positioned so that a balance point is achieved when the chair is only on its back wheels. This position is achieved by rotating the wheelchair backwards around the axles of the large rear wheels.

Preparation

As for the normal preparation as previewed above and:

1. Ensure that the passenger's feet are secure and on the footrests, the push handles are firmly attached, and the brakes are disengaged.
2. Place one foot on the tipping bar and hold onto both push handles.
3. Pressing your foot down on the tipping bar, push the chair away while simultaneously pulling back on the push handles.
4. Gradually tip the chair back until very little weight is felt through the hands.
5. To return the chair into the normal position, place your foot on the tipping bar and gradually lower the casters to the floor.

INCLINES: It is safer to keep the chair pointing up hill whether going up or down. This stops the patient from sliding out of the wheelchair. If you are providing a standby while the patient pushes himself, be aware that the chair is likely to tip backwards. To prevent this, position yourself behind the chair with your hands close to the push handles.

PORTERING UP CURBS:

1. Approach curbs on the perpendicular until the footplates almost touch the curb.
2. Put one foot on the tipping bar, and lift the castor wheels until the chair is in the balance position.
3. Push wheelchair forwards and lower the casters onto the top of the curb.
4. Keep pushing the wheelchair until the rear wheels come into contact with the curb, then push the wheelchair forward and up.

PORTERING DOWN CURBS:

1. Moving backwards, approach the curb so that both wheels are at the edge.
2. Holding on to the push handles, allow the chair to roll slowly backwards and down until the rear wheels are on the floor.
3. Tip the chair into the balance position and roll back until the footplates clear the curb.
4. Slowly lower the front casters to the floor.

UNEVEN OR SOFT TERRAIN: To prevent the chair's tendency to tip forward and to remove the drag induced by the casters, the chair should be tipped back into the balance position. This will keep the user securely in his chair and make pushing easier. To make the task even easier, the chair may be rolled backwards.

STAIRS - UP: This is an advanced skill which should only be attempted by attendants who are well practised and confident in their ability.

Preparation

As for normal preparation as previewed above and:

1. Wheel the chair backwards to the first step so that both wheels are in contact with the stair.
2. Press down on the tipping bar and tilt the chair to the balance position.
3. Place one of your feet on first step and the other foot on the second step.
4. Bend your knees.
5. Straighten your back and arms.

Action

1. Allow the wheel chair to roll slowly up one step in the balance position, counterbalancing the chair's weight with your own.
7. Place front foot above the step that the wheelchair is on and back foot on next higher step.
8. Repeat until at the top of the landing.

Completion

1. Wheel the chair back until the caster wheels are clear of the top step.
2. Slowly lower front wheels to the ground.

Note: If another person is available, he should be instructed to hold onto the frame to guide the chair and keep it from tipping too far forward. This is a difficult skill to perform and should only be used by experienced attendants. The porter at the back of the wheelchair shall be the action controller and guide the assistant.

STAIRS - DOWN:

As for normal preparation as previewed above and:

1. Press down on the tipping bar and tilt the chair to the balance position.

2. Wheel the chair forwards to the first step so that both backwheels are in contact with the stair.
3. Stand close to the chair
4. Bend your knees.
5. Straighten your back and arms.

Action

6. Allow chair to slowly roll down one step in the balance position, counterbalancing the chair's weight with your own.
7. Place your front foot above the step that the wheelchair is on and your back foot on next higher step,.
8. Repeat until at the bottom landing.
9. Slowly lower the castor wheels to the floor.

NEGOTIATING A NARROW DOORWAY: If a doorway is slightly narrower than the Wheelchair it can be negotiated by folding the chair slightly, with the user still in it.

The user lifts his bottom off of the seat by pushing down on the armrests. With the patient pressing most of his weight through one armrest, the attendant should be able to narrow the chair sufficiently to navigate the doorway. This is by no means a smooth manoeuvre and should be started as close to the door as possible.

With chairs that have removable wheels, an alternate method is available. The user leans to the left of the chair so that the attendant can support the right push handle with his left hand, lean down, and remove the right wheel with his right hand. The chair may then be wheeled through the doorway if the user keeps leaning to his left, and the wheel is then replaced.

SAFETY CHECKLIST FOR MANUAL WHEELCHAIRS		
Area of Concern	Assessment	Task Completion
wheelchair user aware and approving of your intentions		
seatbelt on if appropriate		
arms, legs and clothing safely stowed		
grade aids on if climbing a steep incline		
brakes on when complete		
passenger safely positioned on wheelchair		

<<<Equipment: 1 Wheelchair per two students>>>

<<<Exercises: 1. Pushing wheelchair through set course, alternating between blindfolded porter and blindfolded passenger. Change speed and direction without warning. 2. Pushing passenger in chair: up inclines, negotiating curbs, stairs. >>>

Note: some obstacles require special portering techniques. These should only be attempted by the porter if the passenger is willing and if the porter is capable and confident.

Electric Wheelchairs: Portering

Note: electric wheelchairs have a very low clearance of centimetres and; therefore, should not be made to negotiate a curb of more than 4 centimetres. Always find a ramp to negotiate drops or rises in elevation. Prior to portering a client in an electric wheelchair make certain that all items on the checklist have been assessed.

Preparation

1. Introduce yourself and offer assistance. A wheelchair is part of the individual's personal space. This space should not be invaded without permission.
2. Ask the electric wheelchair user how you can help. If they have a preferred technique for completing the task defer to their instructions.
3. Once an approach has been chosen explain how you will go about completing it.
4. If a change of plan is required inform the passenger prior to initiating the change.
5. Confirm that the passenger is seated safely, with feet on the floorboard, arms and clothing clear of obstacles, seatbelt on if appropriate and all luggage secure.
6. Disengage brakes.
7. Disengage clutch.

Action

1. Proceed with plan, as directed by the passenger. If this is not an option proceed with the following:
2. Grasp the wheelchair push handles.
3. Your body should be as close as comfortably possible to the electric wheelchair.
4. Start pushing as smoothly as possible.
5. Ensure that the passenger is comfortable with your speed.
6. While moving, scan the ground ahead for hazards and ensure that the passenger remains safely in the chair as does all luggage (watch for clothing rubbing on wheels).

Completion

1. Slow down smoothly.
2. Turn power on.
3. Reengage clutch.

SAFETY CHECKLIST FOR ELECTRIC WHEELCHAIRS		
Area of Concern	Assessment	Task Completion
scooter user aware and approving of your intentions		
seat belt on if appropriate		
arms, legs and clothing safely stowed		
power off		
clutch disengaged		
ramp or low curb available		
assess for leaking batteries		
passenger safely positioned on scooter		

<<<Equipment: one electric wheelchair per 2 students>>>
<<<Exercise: propulsion of chair through varied terrain and inclines>>>

Scooters: Portering

Note: scooters have a very low clearance and should not be made to negotiate a curb of more than 4 centimetres. Always find a ramp to negotiate drops or rises in elevation. Also, scooters are very difficult and awkward to manipulate unless actually in the seat and at the controls. Only under extraordinary circumstances should a scooter be manually controlled by an attendant. Prior to portering a client in a scooter make certain that all items on the checklist have been assessed.

Preparation

1. Introduce yourself and offer assistance. A wheelchair is part of the individual's personal space. This space should not be invaded without permission.
2. Ask the scooter user how you can help. If they have a preferred technique for completing the task defer to their instructions.
3. Once an approach has been chosen explain how you will go about completing it.
4. If a change of plan is required inform the scooter user prior to initiating the change.
5. Confirm that scooter user is seated safely, with feet on the floorboard, arms and clothing clear of obstacles, seatbelt on if appropriate and all luggage secure.
6. Disengage brakes.
7. Disengage clutch.

Action

1. Proceed with plan, as directed by scooter user. If this is not an option proceed with the following:

2. Grasp the scooter tiller, facing forward.
3. Your body should be as close as possible (and as comfortable) to the scooter.
4. Start pushing as smoothly as possible.
5. Ensure that the passenger is comfortable with your speed.
6. While moving, scan the ground ahead for hazards and ensure that the passenger remains safely in the chair as does all luggage (watch for clothing rubbing on wheels).

Completion

1. Slow down smoothly.
2. Turn power on.
3. Reengage clutch.

SAFETY CHECKLIST FOR SCOOTERS		
Area of Concern	Assessment	Task Completion
scooter user aware and approving of your intentions		
power off		
clutch disengaged		
ramp or low curb available		
passenger safely positioned on scooter		

<<<Equipment: one scooter per 2 students>>>
<<<Exercise: move passenger and scooter through 3 cones>>>

MODULE THREE TRANSFERS

Goals

To promote safe and efficient handling of patients while performing transfers.

Objectives

The student will be able to:

1. Assess a situation to determine the most appropriate transfer technique.

2. Perform the following transfer techniques skilfully and safely.
   - standing pivot
   - sitting pivot
   - two person lift
   - car transfers

Equipment

1. One transfer belt for every two students.
2. One sliding board for every two students.
3. One chair (wheel or standard) for every student.

STANDING PIVOT TRANSFER

Appropriate for the client who can bear weight fully or partially through one or two limbs with reliable consistency. This is a one person transfer. There is a two person variation.

Preparation

1. Position wheelchair parallel to or at a 45 degree angle to the transfer surface (if armrests are not removable chair should be at a 90 degree angle to the transfer surface).
2. Apply brakes and castor locks, ensuring that castor wheels are pointing forward.
3. Remove the arm rest closest to the transfer surface and swing away leg rests.
4. Disengage seat belt and assist/move client well forward in the chair.
5. Pull client well forward in chair and angle feet away from transfer destination.
6. Ensure that feet are flat on the floor and that knees are at 90 degrees.
7. Position yourself in front of the client, bracing their knees and feet with your knees and feet.
8. With knees bent and back and arms straight, grasp the client around the low back or waist band. Ensure that you are as close as possible to the client, allowing their head to rest on your opposite shoulder. Clients arms should be clasped around your trunk or folded across their body.

Action

1. Gently rock the client to the count of three and on three come to a half standing position.
2. Ensure the clients balance then proceed to pivot with the client towards the transfer surface. Continue to brace the clients knees and feet throughout.
3. Slowly lower the client to the transfer surface by bending your knees and telling the client to sit.

Completion

1. Ensure that the user is balanced in her/her new position.
2. Reposition clothing and appliances under the user's direction.

REVIEW CHECKLIST

1. Tell the client what you are going to do.
2. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
3. Ensure client is well positioned before initiating transfer (watch for dangling arms, disengaged seat belts, twisted

ankles,etc).
4. Ensure that castor wheels are forward and locked.
5. Ensure that you are dressed appropriately for the transfer (footwear, clothing, etc.).
6. Ensure that there are no obstructions to movement (seat belts, arm rests, foot rests)
7. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up prior to initiating transfer.
8. Ensure chair and transfer surface are as level as possible
9. Ask for assistance if necessary.

TWO PERSON STANDING PIVOT

Note: This transfer is identical to the standing pivot transfer except for the addition of the assistant whose role it is to act as a safety net from behind the client. The assistant only intervenes when necessary by pulling the client onto the chair or bed.

Assistant's Position

1. Position behind the chair and facing the primary transferor
2. Place the inside knee onto the originating surface
3. Position both hands beneath clients buttocks or on the transfer belt

HALF STANDING PIVOT TRANSFER

Appropriate for the client who is able to partially weight bear through one or both legs. This is a one person transfer. There is a two person variation.

Preparation

1. Position wheelchair with casters forward and the brakes on. If the chair has fixed armrests, the wheelchair should be positioned at 90 degrees to the transfer surface. If the armrests are removable, then the wheelchair should be positioned between 0 - 40 degrees to the transfer surface.
2. Lift footplates or swing away footrests and remove the armrest next to the destination surface.
3. Move the client to the front of his/her chair by asking him to lean back while gently pulling on his/her legs.
4. Position client's feet so that the one closest to the seat is slightly forward.
5. Brace the user's knees with yours and lower him forwards so that his shoulder rests on your hip opposite to the side furthest from the transfer destination.
6. Hold on to the side of the client's waistband or place your hands under his ischium.

Action

1. Keeping your back straight, lean back using the knees as a pivot point until the user's seat lifts slightly off the chair.
2. Maintaining knee contact, pivot around until the client's bottom is over the chair.
3. Gently lower the client down.

Completion

1. Ensure that the client is balanced in her/her new position.
2. Reposition clothing and appliances under the user's direction.

TWO PERSON SITTING PIVOT

Note: This transfer is identical to the sitting pivot transfer except for the addition of the assistant whose role it is to act as a safety net from behind the client. The assistant only intervenes when necessary by pulling the client onto the chair or bed.

Assistant's Position

1. Position behind the chair and facing the primary transferor
2. Place the inside knee onto the originating surface
3. Position both hands beneath clients buttocks or on the transfer belt

REVIEW CHECKLIST

1. Tell the client what you are going to do.
2. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
3. Ensure client is well positioned before initiating transfer (watch for dangling arms, disengaged seat belts, twisted ankles,etc).
4. Ensure that castor wheels are forward and locked.
5. Ensure that you are dressed appropriately for the transfer (footwear, clothing, etc.).
6. Ensure that there are no obstructions to movement (seat belts, arm rests, foot rests)
7. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up prior to initiating transfer.
8. Ensure chair and transfer surface are as level as possible
9. Ask for assistance if necessary.

SITTING PIVOT TRANSFER

Appropriate for the fully dependent client. This is a one person transfer. There is a two person variation.

1. Sliding Board Transfer

Preparation

1. Position wheelchair at 30 to 45 degrees to the transfer surface.
2. Ensure that wheelchair and transfer surface are as level as possible.
3. Apply brakes and castor pin locks ensuring that castor wheels are pointing forward.
4. Pull client well forward in chair and angle feet away from transfer destination.
5. Remove arm rest on the side next to the transfer surface.
6. Lean client away from destination and slide transfer board beneath buttocks, ensuring that board is well beneath both buttocks and is not pinching any soft tissue.
7. Position yourself in front of client with knees bent and bracing clients knees. Keep your back straight, pelvis tilted and feet turned towards the transfer surface.
8. Position client with their head resting on your far hip\thigh and arms clasping your trunk or folded onto clients lap.
9. Grasp client's waist band by sliding both thumbs under band at the back seam then sliding each thumb to opposite side seams. Take up the slack of the fabric and grasp firmly.

Action

1. Rocking to the count of three, slide the client from the chair to the transfer destination.

Completion

1. Position the client safely on the transfer destination surface.
2. Reposition clothing and appliances under the client's direction.

REVIEW Checklist

1. Always explain the transfer procedure to the client.
2. Ensure that the wheelchair has been appropriately positioned.
3. Ensure that castor wheels are forward and locked prior to initiating transfer.
4. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
5. Ensure that there are no obstructions to movement.
6. Ensure that you are dressed appropriately for the activity

7. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up.
8. Ensure client is well positioned before initiating transfer (watch for dangling arms, disengaged seat belts, twisted ankles, pinched skin, etc).
9. Ask for assistance if necessary
10. Ensure chair and transfer surface are as level as possible

Two Person Variation

Note: This transfer is identical to the sliding board transfer except for the addition of an assistant.

Assistant's Position

1. Position behind the chair and facing the primary transferor
2. Place the inside knee onto the originating surface
3. Position both hands beneath clients buttocks or on the transfer belt

2. Towel Transfer

Appropriate when no sliding board is available, when client's clothing is inappropriate (skirt or delicate fabrics), when skin is prone to breakdown or when attendants arms are short.

Preparation

As for sliding board transfer except delete step five and substitute step 8.

8. Position towel beneath clients buttocks. Ensure that towel is well placed (and will not slide out from behind or up to the knees) by pulling up on the towel ends.

3. Transfer Belt

Appropriate when no sliding board is available, when client's clothing is inappropriate (skirt or delicate fabrics) or when skin is prone to breakdown.

Preparation

As for sliding board transfer except delete step five and substitute step 8.

8. Apply transfer belt around clients waist snugly and ensure that it is secure with a trial pull.

TWO PERSON LIFTS

1. **Moderately Dependent Lift**

Appropriate for the partially dependent client who does not exhibit deficits in the upper extremities. This is a two person lift.

Preparation

1. Designate the transfer leader.
2. Position the chair close to the destination surface but not so close that it will impede action.
3. Do not apply the brakes.
4. Ensure that seat belt is disengaged.
5. Position yourselves on opposite sides of the chair, facing forward.
6. The client shall cross his/her arms firmly.
7. Slide your inside arm under the clients arm and grasp the clients forearm.
8. Your outside arm shall slide beneath the clients leg and hold firmly.
9. Instruct the client to squeeze his arms into his side.
10. Ensure that your knees are bent, your back is straight and that you are as close as possible to the client.

Action

1. On the leaders count of three, keeping your back straight, straighten your knees and lift.
9. Carry client over to the destination surface and, on the leaders count of three, bend knees to lower user, keeping your back straight.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

REVIEW CHECKLIST

1. Tell the client what you are going to do.
2. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
3. Ensure client is positioned well before initiating transfer (watch for dangling arms, twisted ankles,etc).
4. Ensure that you are dressed appropriately for the transfer (footwear, non-restrictive clothing, etc.).
5. Ensure that there are no obstructions to movement (seat belts, arm rests, foot rests)
6. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up prior to initiating transfer.
7. Ensure chair and transfer surface are as level as possible
8. Ask for assistance if necessary.

2. Maximally Dependent Lift

Appropriate for the fully dependent client who exhibits decreased function of the upper extremities. This is a two person lift.

Preparation

1. Designate the transfer leader.
2. Position the chair close to the transfer destination but not so close that it will impede action.
3. Do not apply the brakes.
4. Position yourselves on opposite sides of the chair facing backward.
5. Bend your knees.
6. Place inside hand on the medial side of the clients thigh.
7. Lean client forward so that his shoulders rest against your upper arm.
8. Slide your outside thumb behind the clients waistband at the back, slide it to the side seams of the garment and grasp material firmly, taking up any slack.

Action

1. Keeping your back and arms straight, straighten your legs to raise the client.
2. With your leg push the wheelchair out of the way.
3. Manoeuvre the client over the new surface.
4. Lower the client by bending your legs.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

REVIEW CHECKLIST

1. Tell the client what you are going to do.
2. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
3. Ensure client is positioned well before initiating transfer (watch for dangling arms, twisted ankles,etc).
4. Ensure that you are dressed appropriately for transfer (footwear, non-restrictive clothing, etc.).
5. Ensure that there are no obstructions to movement (seat belts, arm rests, foot rests).
6. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up prior to initiating transfer.
7. Ensure chair and transfer surface are as level as possible
8. Ask for assistance if necessary.

THREE PERSON LIFT (BED TO STRETCHER LIFT)

Appropriate for the fully dependent client. This is a three or person lift depending on the clients size.

Preparation

1. Designate the transfer leader.
2. Position the stretcher immediately adjacent to the bed with no gap between the two.
3. Apply the brakes on both the bed and the stretcher.
4. Ensure that the draw (transfer) sheet is positioned above the clients shoulders and below the clients buttocks. To insert sheet roll the client to one side, position the rolled up draw sheet, then roll the client back and pull draw sheet out underneath the client.
5. Place all equipment (leg bags, catheters, etc.) out of harms way (usually towards the surface the client is being transferred to).
6. Prop clients legs into the crook position.
7. Position yourselves on opposite sides of the client with the majority of staff on the "pull" side of the client.
8. Grasp the rolled up ends of the draw sheet with both hands, arms slightly supinated and a key grip.
9. Ensure that your knees are bent, your back is straight and that you are as close as possible to the client.

Action

1. On the leaders count of three, keeping your back straight, pull the client over to the destination surface.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

REVIEW CHECKLIST

1. Tell the client what you are going to do.
2. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
3. Ensure client is positioned well before initiating transfer (watch for dangling arms, twisted ankles,etc).
4. Ensure that you are dressed appropriately for the transfer (footwear, non-restrictive clothing, etc.).
5. Ensure that there are no obstructions to movement (seat belts, arm rests, foot rests).
7. Ensure bed and transfer surface are as level as possible.
8. Ask for more assistance if necessary.

STANDING PIVOT TRANSFER
(CHAIR TO CAR)

Appropriate for the client who can bear weight fully or partially through one or two limbs with reliable consistency. This is a one person transfer. There is a two person variation.

Preparation

1. Position wheelchair parallel to or at a 30 - 45 degree angle to the passenger seat.
2. Apply brakes and castor locks, ensuring that castor wheels are pointing forward.
3. Remove the arm rest closest to the passenger seat and swing away leg rests.
4. Disengage seat belt and assist/move client well forward in the chair.
5. Pull client well forward in chair and angle feet away from transfer destination.
6. Ensure that feet are flat on the floor and that knees are at 90 degrees.
7. Position yourself in front of the client, bracing their knees and feet with your knees and feet.
8. With knees bent and back and arms straight, grasp the client around the low back or waist band. Ensure that you are as close as possible to the client. Clients arms should be clasped around your trunk or folded across their body.

Action

1. Gently rock the client to the count of three and on three come to a half standing position.
2. Ensure the clients balance then proceed to pivot with the client towards the passenger seat. Continue to brace the clients knees and feet throughout.
3. Slowly lower the client to the passenger seat by bending your knees and telling the client to sit. Ensure that the clients head clears the door frame.

Completion

1. Ensure that the user is balanced in her/her new position.
2. Reposition clothing and appliances under the user's direction.

REVIEW CHECKLIST

1. Tell the client what you are going to do.
2. Ensure brakes on all moving objects have been applied (chair, bed, etc.) if appropriate to the transfer.
3. Ensure client is well positioned before initiating transfer (watch for dangling arms, disengaged seat belts, twisted ankles,etc).

4. Ensure that castor wheels are forward and locked.
5. Ensure that you are dressed appropriately for the transfer (footwear, clothing, etc.).
6. Ensure that there are no obstructions to movement (seat belts, arm rests, foot rests)
7. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up prior to initiating transfer.
8. Ensure chair and passenger seat are as level as possible
9. Ask for assistance if necessary.

TWO PERSON STANDING PIVOT

Note: This transfer is identical to the standing pivot transfer except for the addition of the assistant whose role it is to act as a safety net from behind the client. The assistant only intervenes when necessary by pulling the client onto the passenger seat.

Assistant's Position

1. Position in the car in drivers sear and facing the primary transferor
2. Position both hands on the transfer belt

SITTING PIVOT WITH TRANSFER BOARD
(CHAIR TO CAR)

Appropriate for the fully or partially dependent client. This is a one person transfer.

Preparation

1. Remove left arm rest and leg rest and position chair adjacent to passenger seat.
2. Apply brakes and caster pin locks, ensuring that the castor wheels are pointing forward.
3. Put the client's left foot in the foot well of the car and right foot on the left footplate.
4. Stand behind the user.
5. Slide client forward by having him lean back as you push his hips forwards.
6. Leaning client away from the car, slide transfer board under user so that at least 4" is on the wheelchair seat.

Action

1. Lean the user's upper body away from the car, supporting him with your right arm.
2. With you left hand, slide the patient along the transfer board into the car.
3. Place right foot in car so that the user's legs are frogged to dissuade spasms and allow drainage of leg bag.

Completion

1. Remove wheelchair.
2. Remove transfer board.
3. Fasten seat belt.
4. Ensure that the client is balanced in his/her new position.
5. Reposition clothing and appliances under the client's direction.

SITTING PIVOT WITH TRANSFER BOARD
(CAR TO CHAIR)

Appropriate as above.

Preparation

1. Remove left arm rest and leg rest and position chair adjacent to passenger seat.
2. Apply brakes and caster pin locks and ensure that the castor wheels are pointing forward.
3. Place cushion on chair.
4. Position the user's right foot on the left footplate and left foot close to the car door.
5. Stand behind the wheelchair.
6. Slide user forwards by having him lean back as you push his hips forwards.
7. Slide transfer board under user so that at least 4" is on the car seat.

Action

1. Lean the user's upper body into the car, supporting him with your left arm.
2. With you right hand, slide the patient along the transfer board onto the wheelchair.

Completion

1. Position client's feet on footplates.
2. Back chair out and replace armrest.
3. Adjust client's position if necessary.
4. Adjust client's clothing and appliances under client' direction.

MODULE 4 POSITIONING IN THE CHAIR

Goal

To promote safe and efficient handling of patients while assisting in positioning in the chair.

Objectives

By the end of this lesson the student will be able to:

1. Assess the position status of a client in his/her chair.
2. Choose the appropriate technique for repositioning the client in her/his chair.
3. Execute the technique safely and efficiently.

Equipment

1. One wheelchair for every two students.

POSITIONING

Note: It is frequently necessary to change a client's position in his chair, either following a transfer or if he has slipped.

<<<overhead of well seated client>>>

a) Movement Back Into The Chair

Preparation

1. Tell the client what you are going to do.
2. Place the casters in the forward position and apply the brakes.
3. Stand in front of the chair with your knees in contact and on either side of the client's knees.
4. Lower the user's head and shoulders forwards and away from the side to which he is to be moved.

Action

1. Reach forwards and hold onto the client's waistband with one hand and the chair armrest with the other.
2. Maintaining knee contact, rock back and push client back into the chair with your knees.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

Alternative Method

Preparation

1. Move casters forward into forward position and apply brakes.
2. Stand behind chair.
3. Place client's hands on lower abdomen.
4. Slide right hand between client's arms and body and place on top of his hands.
5. Lower client's head forwards and slide your left hand around the other side of the body into the same position.

Action

1. Bend your elbows to 90 degrees and squeeze the client between his ribs and pelvis.
2. Use your forearm to push the client up and forward and your hands to slide him back.

Completion

1. Ensure that the client is balanced in his/her new position.

2. Reposition clothing and appliances under the clients direction.

b) Movement Forward In The Chair

Preparation

1. Tell the client what you are going to do.
2. Place the casters in the forward position and apply the brakes.
3. Instruct the client to lean back against the chairs backrest.
4. Position yourself in front of the client with both knees bent and pelvis tilted. Place both hands under the clients thighs just behind the knees.

Action

1. Bracing with your legs, pull client forward in the wheelchair.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

c) Movement Sideways In The Chair

Preparation

1. Tell the client what you are going to do.
2. Place the casters in the forward position and apply the brakes.
3. Instruct and/or assist the client to lean away from the side towards which he will be moving.
4. Position self on the side that movement will be occurring and place inside hand beneath clients nearest buttock and outside hand over opposite hip.

Action

1. Pull up with inside hand and apply counter pressure with outside hand.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

Review Checklist

1. Ensure that you are appropriately dressed for the activity.
2. Always explain the transfer procedure to the client.
3. Ensure that the wheelchair has been appropriately positioned.
4. Ensure that castor wheels are forward and locked prior to initiating transfer.
5. Ensure brakes on all moving objects have been applied (chair, bed, etc). if appropriate to the transfer..
6. Ensure that there are no obstructions to movement.
7. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up.
8. Ensure client is well positioned before initiating transfer (watch for dangling arms, disengaged seat belts, twisted ankles, pinched skin, etc.)
9. Ask for assistance if necessary.

MODULE 5 POSITIONING IN THE BED

Goal

To promote safe and efficient handling of patients while assisting in positioning in the bed.

Objectives

By the end of this lesson the student will be able to:

1. Assess the position status of a client in his/her bed.
2. Choose the appropriate technique for repositioning the client in her/his bed.
3. Execute the technique safely and efficiently.

Equipment

1. One bed for every two students.
2. One draw sheet for every two students.

POSITIONING

Note: It is frequently necessary to change a client's position in his\her bed, either following a transfer or if he has slipped.

<<<overhead of well positioned client>>>

Preparation

1. Tell the client what you are going to do.
2. Apply the brakes.
3. Prop clients legs into crook position.
4. Stand on either side of the bed with one knee on the bed and pelvis tilted, grasping the draw sheet with arms slightly supinated and with a key grip. Face the direction to which you will be moving the client.
5. Instruct the client to lift his\her head during the repositioning.

Action

1. On the leader's count of three, pull the client in the appropriate direction.

Completion

1. Ensure that the client is balanced in his/her new position.
2. Reposition clothing and appliances under the clients direction.

Review Checklist

1. Ensure that you are appropriately dressed for the activity.
2. Always explain the transfer procedure to the client.
4. Ensure that beds wheels are locked prior to initiating transfer.
6. Ensure that there are no obstructions to movement.
7. Never grasp a clients belt loops or skirt when grasping a waistband. Ensure all slack is taken up.
8. Ensure client is well positioned before initiating transfer (watch for dangling arms, disengaged seat belts, twisted ankles, pinched skin, etc.)
9. Ask for assistance if necessary.

MODULE 6 INTRODUCTION TO DISABILITY

Goal

To promote a greater understanding of the sequelae and ramifications of injury and disease in regards to transfers and portering.

Objectives

By the end of this module the student will be able to:

1. Identify some of the secondary effects of a variety of diseases and injuries to the body.
2. Utilize a variety of coping strategies to overcome the limitations that these sequelae may impose on interaction with clients.

Equipment

1. One Overhead Projector.

Definitions

SPASTICITY

Definition

Involuntary muscle movement caused by injury or disease of the nervous system.

Significance

Spasticity can be elicited by touch, quick stretches of the muscles, increased effort, stress\excitement, temperature change, illness or noxious stimuli (burns, bee stings, etc.). Some of these stimuli can be avoided by using proper client handling techniques. If spasticity is present, it can throw the client or transferor off balance and can make it difficult for the client to be positioned and maintain position.

DECREASED BONE STRENGTH

Definition

Decreased bone strength is caused by demineralization of bones secondary to disuse and illness.

Significance

While handling clients, care must be taken not to put bones at risk through faulty positioning and improper transfer techniques.

DECREASED SKIN INTEGRITY

Definition

Decreased skin integrity manifests in the form of pressure sores or areas of fragile or at risk skin due to a variety of reasons. The natal cleft and areas of bony prominences are of particular risk.

Significance

While handling clients skin integrity must not be compromised by faulty handling techniques (scraping buttocks over tires or pulling centre seams of trousers into the natal cleft.

DECREASED SENSATION

Definition

Decreased sensation is caused by damage to the nervous system supplying specific areas (varies from client to client). Loss of sensation may be partial or complete.

Significance

Decreased sensation is significant as the individual may not be able to detect, and thus report, pain or discomfort caused by

pinching, abrasions or twisting of joints. Therefore, the transferor must ensure that handling does not compromise skin, bone or joint integrity.

DECREASED STRENGTH

Definition

Decreased muscle strength may be the result of interruption of the nerve supply to muscle, decreased integrity of the muscle or disuse of the muscle.

Significance

Decreased strength leads to a decreased ability to assist with transfers and to protect joints and soft tissue. It is important to ensure that the capabilities of the individual are well known so that injury does not occur.

DECREASED JOINT RANGE OF MOTION

Definition

As a result of soft tissue or articular changes, the range through which a limb can move may be decreased.

Significance

One must ensure correct positioning of arms and legs prior to transfer as limbs may not be capable of moving throughout the full range of movement and are thus at risk of injury.

DECREASED BALANCE

Definition

The clients ability to maintain his\her body in equilibrium may be partially or completely impaired for a variety of reasons (decreased sensation, decreased strength, decreased co-ordination, etc.).

Significance

One must ensure that the client is adequately supported throughout all phases of the transfer to ensure that overbalance and subsequent potential for injury does not occur.

INCONTINENCE

Definition

Incontinence is the inability to retain urine or feces. This is caused by a variety of reasons including structural and neurological.

Significance

As some clients who are incontinent will be using a catheter and leg bag, ensure that all such equipment is secure from disengagement during the procedure. In that event of incontinence, the client should be safely positioned. Following this an absorbent pad can be placed between their buttocks and the sitting surface. This situation should be addressed immediately as failing to do so can lead to bladder infections and skin breakdown.

AUTONOMIC DYSREFLEXIA

Definition

Autonomic Dysreflexia is a syndrome which is characterized by a sudden, severe headache secondary to an uncontrolled increase in blood pressure (Zejdlik, 1992). This syndrome can be caused by a variety of stimuli, the most common being an overextended bladder. Other stimuli can include constipation, urinary infection and even ingrown toenails.

Significance

Autonomic Dysreflexia is considered to be a medical emergency. One should observe for a sharp rise in blood pressure, pounding headaches, flushing, cold sweats, nausea, goose bumps and apprehension. When encountering such symptoms the client should be seated to help decrease blood pressure and a physician should be notified. It can also be useful to check catheter tubing for kinks.

DECREASED COMMUNICATION SKILLS

Definition

Clients may have a difficulty or an inability to communicate with the transferor. This may be of motor or cognitive origin.

Significance

Ensure that you understand the nature of the clients communication deficit. Clients may have difficulty understanding what is being said, have an inability to find the right words to communicate their wishes or have an inability to verbalize organized thought. In this situation it is important to always tell the client exactly what you are going to be doing with them and demonstrate if necessary. The client should not be rushed to finish sentences, their sentences should not be finished for them and speaking loudly at them will not improve communication. Alternate means of communication can be explored (Bliss Board, letter board, etc.).

DECREASED PERCEPTION

Definition

A decrease in the clients ability to be aware of his\her environment or body and his\her interaction with that environment can be due to a variety of factors including visual deficits, cognitive impairment or neurological impairment (ie. decreased sensation).

Significance

Decreased perception can lead to a decrease in body awareness and\or safety awareness. This client can not be relied on to ensure his\her own safety and comfort during the transfer.

NEGLECT

Definition

Neglect falls within the category of decreased perception. This client may be completely unaware of parts of his\her body or the environment with which he\she is interacting.

Significance

Neglect can lead to a decreased safety awareness and therefore a client presenting with neglect can not be relied on to ensure his\her own safety and comfort.

INAPPROPRIATE BEHAVIOUR

Definition

Inappropriate behaviour can result from injury to the brain or as an emotional response to acute disability.

Significance

Inappropriate behaviour can present in a number of ways. Both the safety of the client and of the transferor should be ensured when responding to such behaviour. If this is not possible, the transfer should be aborted. It is best not to react to inappropriate behaviour but to let the individual know that the behaviour displayed is not appropriate.

SIDE-EFFECTS OF INJURY AND DISEASE

* Often x Sometimes	spinal cord injury	Head Injury	Cerebro-vascular injury	Arthritis	Muscle and Nerve	Ag-ing
spasticity	*	*	*		*	
decreased bone strength	*	x	x	*	*	*
decreased skin integrity	*				*	*
decreased sensation	*	*	*		*	*
decreased strength	*	*	*	*	*	*
decreased joint rom	*	*	*	*	*	*
decreased balance	*	*	*	*	*	*
in-continence	*	x	x		x	x
autonomic dysreflexia	*					
decreased com-munication skills		*	*		x	*
decreased perception		*	*			*
neglect		*	*			
inappriate behaviour		*	*			*

SUMMARY

In the final analysis, this modular education package fulfils many of the criteria for an effective educational tool. The content of a learning experience should exhibit validity and significance for the intended student with the objectives being well understood by the student. Because this package was generated by the interest of the students and because the students and potential students played an integral role in determining the content, there is an assurance that the content will be matched to the needs of the learners. Due to the fact that this curriculum is intended to enhance health care workers abilities to complete tasks (such as the movement of patients) safely and efficiently and combined with the fact that this program was designed with input from the students there is further insurance that students will obtain satisfaction from carrying on the behaviour implied by the objectives.

Another criteria filled by this package is that the learning outcomes desired are within the range of possibility for the intended students. The areas covered in this program encompass skills which are essential to the jobs carried out by health care workers. The content in the education package is adequate for carrying out the skills taught and supplemental information is covered within the curriculum of each individual discipline group. For example, physiotherapy students taking the transfer skills modules would have already undertaken studies in back care and body mechanics prior to taking this course.

Learning experiences should be well organized in order to fulfil their objectives. The modular nature of this package allows participants to customize their education package and make the program fit their needs. This also assists physical therapists who may have little to no teaching experience with the teaching of the content. The content is specific enough to ensure that all essential information is covered by the instructor but is unstructured enough in format to allow for creative use of many different educational experiences to obtain the same objectives. This specificity of content within a modular format also facilitates transfer of skills from one area to another.

The fulfilment of these criteria results in an education package which is efficient, effective and will assist in the delivery of a standard base of knowledge.

REFERENCE LIST

Bell, J. (1981). Developing a Modular Teaching Unit. Tesl Talk,3-7.

Berwick, M.,Budman,S., Feldstein, M. (1989). No clinical effect of back schools in an HMO. Spine,14, 338-344.

Block, J., Efthim, H. and Burns, R. (1989). **BUILDING EFFECTIVE MASTERY LEARNING SCHOOLS**. New York: Longman.

Bloom, B.S. (1974). **AN INTRODUCTION TO MASTERY LEARNING**. New York: Rinehart and Winston.

British Columbia Rehabilitation Society (1991). WELCOME TO G.F. STRONG CENTRE: Information for You and Your Family. Vancouver: Ultratech Press.

Chenowith, D (1983). Health Promotion: Benefits vs. Costs. Occupational Health and Safety, 52(5), 37-41.

Downey, P. and Feldman, R. (1986). A Framework for the Planning of Health Education Programs: Health Interests and Practices. Health Education Journal,October/November.

Fitzler, S. (1982). Attitudinal Change: The Chelsea Back Program. Occupational Health and Safety, 51(1), 24-26.

Fitzler, S. (1983). Chelsea Back Program: One Year Later. Occupational Health and Safety, 52(5), 52-54.

Ford, J. and Duckworth, B. (1987). Physical Management for the Quadriplegic Patient. U.S.A.: F.A. Davis Company.

G.F. Strong Centre (1992). **G.F. STRONG CENTRE PHYSIOTHERAPY POLICY\PROCEDURE MANUAL**. Vancouver: G.F. Strong Centre Press.

G.F. Strong Centre (1983, July). Memo from the accident prevention committee. (Available from H. Rumble, G.F. Strong Centre, 4255 Laurel Street, Vancouver, B.C. Canada)

G.F. Centre (1992, June). **G.F. Strong Centre Physiotherapy Policy/Procedure Manual**. Vancouver: G.F. Strong Centre Press.

Giddings, L. (1987). The Module: A Promising Instructional Vehicle For College Teaching,Community Review, 7(2), 23-30.

Goldschmid, B. and Goldschmid, M. (1973). MODULAR INSTRUCTION IN HIGHER EDUCATION: A REVIEW, Higher Education 2, 15-32.

Green, L., Kreuter, M., Deeds, S., and Partridge, K. (1980). Health Education Planning-A Diagnostic Approach. California: Mayfield.

Greenwood, J. (1986). Back Injuries Can Be Reduced With Worker Training, Reinforcement. Occupational Health and Safety, 55(5), 26-29.

Jonathon, R. (1987). The Case For and Against Modularization. Scottish Educational Review,19(2), 86-97.

Kunstel, F. (1978). Assessing community needs: Implications for curriculum and staff development in health education. The Journal of School Health,48(4), 220-224.

LeBourdais, C.M. (1987). Effective Back Training Programs Need Input From All Levels. Occupational Health and Safety, 56(2), 60.

Levine, H., Daeschner, C.and Emery, J. (1977). Evaluation of a Modularized System of Instruction in Pediatrics. Journal of Medical Education,52, 213-215.

M. Brook (personal communication, September, 1992)

Melton, B. (1983). Back Injury Prevention Means Education, Occupational Health and Safety, 52(5), 20-23.

Morris, A. (1984). Program Compliance: Key To Preventing Low Back Injuries, Occupational Health and Safety, 53(3), 44-47.

Greenwood, J. (1986). Back Injuries Can Be Reduced With Worker Training, Reinforcement. Occupational Health and Safety, 55(5), 26-29.

Jonathon, R. (1987). The Case For and Against Modularization. Scottish Educational Review,19(2), 86-97.

Kunstel, F. (1978). Assessing community needs: Implications for curriculum and staff development in health education. The Journal of School Health,48(4), 220-224.

LeBourdais, C.M. (1987). Effective Back Training Programs Need Input From All Levels. Occupational Health and Safety, 56(2), 60.

Levine, H., Daeschner, C.and Emery, J. (1977). Evaluation of a Modularized System of Instruction in Pediatrics. Journal of Medical Education,52, 213-215.

M. Brook (personal communication, September, 1992)

Melton, B. (1983). Back Injury Prevention Means Education, Occupational Health and Safety, 52(5), 20-23.

Morris, A. (1984). Program Compliance: Key To Preventing Low Back Injuries, Occupational Health and Safety, 53(3), 44-47.

Naisbitt, J. (1984). **MEGATRENDS: Ten New Directions Transforming Our Lives**. New York: Warner Books, Inc..

Neill, S. (1978). **THE COMPETENCY MOVEMENT**. Lubeck: California.

Oliva, P. (1993). Supervision For Today's Schools. New York: Longman.

Pratt, D. (1980). Curriculum: Design And Development. New York: Harcourt Brace Jovanovich.

Posner, J. and Rudnitsky, A. (1986). Course Design: A Guide To Curriculum For Teachers. New York: Longman.

Statistics Canada (1992). Back Injuries In The Work Place. Perspectives On Labour And Income, 4(3).

Taba, H. (1962). Curriculum Development: Theory and Practice. New York: Harcourt, Brace & World, Inc..

Taber, C.W. (1993). TABER'S CYCLOPEDIC MEDICAL DICTIONARY. Philadelphia: F.A. Davis Company.

Tones, K. (1990). Why Theorize? Ideology in health education. Health Education Journal,44, 2-6.

Tyler, R. W. (1949). Basic Principles of Curriculum and Instruction. Chicago: The University of Chicago Press.

Van Eijl, P.J. (1986). Modular Programming of Curricula, Higher Education 15, 449-457.

Vancouver Safety Council Electric Wheelchair and Scooter Safety Steering Committee (1992). Getting Around on an Electric Wheelchair or Scooter. Canada: University Printers Limited.

Wollenberg, S.P. (1989). A Comparison of Body Mechanic Usage in Employees Participating in Three Back Injury Prevention Programmes. International Journal of Nursing Studies, 26(1), 43-52

Wulf, K. and Shave, B. (1984). Curriculum Design: A Handbook For Educators. California: Scott, Foresman and Company.

Zejdlik, C. (1992). Management Of Spinal Cord Injury. Boston: Jones and Bartlett Publishers.