Barriers to Multicompetency: Survey Results of Respiratory Technicians, Therapists, Managers and Educators

by

Perry K. Bush

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Barriers to Multicompetency: Survey Results
of Respiratory Technicians, Therapists, Managers and Educators

Perry K. Bush

A Master's Research Project in Partial Fulfillment
of the Requirements for the Degree
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of Respiratory Technicians, Therapists, Managers and Educators

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DEDICATION

This Thesis is dedicated to two people to whom I owe a great deal of gratitude and who were instrumental in shaping my life.

First, to Dr. Craig Scanlan for being a guiding light for me and who has helped me professionally on many occasions. Secondly, to Dr. Ruth Elsasser, who believed in me and had more faith in me than I did and challenged me to greater heights.
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I am also thankful that acknowledgements are customarily included and read before the body of the paper.

Perry K. Bush
ABSTRACT

Multicompetency in the health care industry is becoming a greater possibility as this nation explores health care reform. Yet, little research has been done to determine what barriers this concept could face upon integration into particular health care fields, including respiratory therapy. Therefore, this study identified potential barriers to becoming a multi-competent in respiratory care practitioner and sought to determine which barriers are perceived as being more significant. Addressing potential barriers may have a significant impact on whether turning multicompetency into a reality on a national basis is an easy or difficult task. One hundred respiratory care technicians, therapists, managers and educators were randomly chosen from around the nation to complete a pretested survey to gain perceptions of multi-competency needs and to identify and prioritize potential barriers to achieving multicompetency. The study clearly showed that all four groups of respiratory care professionals perceived a real need for multicompetency. The hypothesis that these professionals would agree that there are barriers exist, but that each of the four cohorts would identify and prioritize potential barriers differently depending upon the scope of their job responsibility and work setting, was moderately supported by the research. A chi-square analysis exploring various demographics of cohorts was significant in the area of cost effectiveness, which urban workers saw as a barrier to a higher degree than did rural workers, and in the area of manpower shortage, which educators and managers identified as a higher priority than did technicians and managers. While the study failed to identify cohort-specific barriers, the high response rate (50%) lends credence to the results, which may guide future research in other health care specialties.
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Barriers to Multicompetency: Survey Results of Respiratory Technicians, Therapists, Managers and Educators

Introduction

Health Care: A System in Turmoil

In President Bill Clinton's initial address on health care reform, he indicated just how badly the health care system is broken and that it is time to fix it. Such a situation exists despite the dedication of millions of health care professionals. Not only is our health care system on the verge of bankruptcy (O'Daniel, et al., 1992; Akroyd, Bamberg, Hall, 1992; PEW Commission, 1991), it is too uncertain, too expensive, too bureaucratic and too wasteful. After decades of false starts, a proposal for a national health care plan was finally revealed by our current president. But the plan did not make it far from the starting gate before it began to take different shapes, and it is not known when a plan will ever make it to a vote before what is now a Republican-dominated House and Senate which may have other items on their agendas.

Whatever health care reform is passed, it must produce savings, as our medical bills have grown at twice the rate of inflation, despite the introduction of prospective payment systems and the implementation of Diagnostic Related Groups a decade ago (Bunch, 1990). According to Clinton, current spending rates on health care are more than 14 percent of our national income, a third more than any other country in the world.

Most people would agree that any new health care system must serve
all Americans, including the 37 million people who do not currently have any form of medical insurance, and the system must provide savings by cutting waste and abuse without harming health care quality (O'Daniel, 1992; Akroyd, Bamber, Hall, 1992).

In addition to costs, other significant forces such as demographics are also cause for demanding changes in the structure and organization of the health care delivery system. Contributing factors relating to these forces include fewer nurses in the work force, hospital closings, too many empty hospital beds and the expensive costs of Medicare. Citizens in rural areas are also faced with a disproportional low number of physicians (PEW Commission, 1991; Bunch, 1990).

An aging population will present a significant challenge to society in the next century as this growing group will create an increased demand for services. Home care will also become important as hospitals and government try to get patients out of the hospitals and into the home as quickly as possible.

Gerontologists predict that the portion of the American population that is over 65 years of age is increasing at a far greater rate than the under-65 cohort, and that the older population of 85 and older is increasing at the fastest rate of all (Adams, 1989). Life expectancy has increased by 50 percent, or an average of 25 years, in this century alone (Mason, 1991). Challenges include the need to increase our awareness of common chronic illnesses seen with the older population.

Four of the six terms expressed by President Clinton in reference to
health care—security, savings, quality and responsibility—will directly or indirectly affect respiratory care. The American public, according to Mr. Clinton, wants to feel secure that health care will be there for them, whatever their status, and wants to feel that the health care industry will take the responsibility (perhaps under the watchful eye of government) to provide quality care as economically as possible. These factors, each of which points to a greater accountability to the American public, also translate into greater scrutiny of American health care and perhaps a restructuring of many, if not all, of its components, including respiratory care. Therefore, each of the four factors will be addressed as to the effect they have had on the promotion of the concept of multicompetency.

Muticompetency Defined

One of the major health care trends that has been stimulated by health care reform talk is multicompetency. Many experts agree that health care professionals of the future will have to be multicompetent in order to meet the needs of a greater ambulatory patient population. Multicompetency has been an increasingly popular focus of medical literature as researchers and practitioners recognize its enormous benefits over the traditional method of care. The greatest benefit is that it will reduce costs (Multicompetency, 1993).

Blayney defines multicompetency as "those who can perform functions extraordinary to the expectations of their disciplines."(Beachey, 1988). The purpose of multicompetency is to have versatile practitioners who are able to perform a broad range of skills in at least two different allied health professions, thereby bringing about a more efficient use of human resources.
(Beachey, 1986). In the year 2005, RCP's (respiratory care practitioners) are predicted to have a greater role in patient care. In order to take on this additional responsibility, increased levels of knowledge will be needed, knowledge which is expected to come from increased levels of education.

With the present state of the economy and ever-increasing levels of health care, many health care organizations are taking steps to decrease the cost of health care by requiring that each department justify each job and procedure and be ready with ideas about how things could be done differently. Efforts directed toward reducing unnecessary procedures—and hence lowering costs—will result in increased pressure to eliminate respiratory care from non-critical areas altogether. A change in the role may be necessary; for instance, a consultant may be more appropriate in the coming years. It is important for respiratory care departments to be open-minded, proactive and in control of necessary changes, as hospitals will have to restructure jobs so employees are doing more diversified duties.

Respiratory care is a dynamic and volatile profession. It has been anything but stagnant in the last ten years and has changed every decade since its inception (Dunne, 1992). By identifying what brought us to this point we can hope to determine what forces will lead us to further expansion of our roles. Those of us who practice respiratory care are well accustomed to change, and this is to our advantage as health care reform will change the profession for years to come. Two of the major forces that will significantly influence the profession are an aging population and a well-established trend toward health awareness. As the average life span increases, chronic illness will proliferate.
The increasing incident of chronic illness will enable respiratory care professionals to expand the reach of their skills as nutritional and metabolic consultants (Wissing, 1989).

RCP's are well positioned to demonstrate their cost effectiveness in the area of multicompetency. The Bronx Municipal Hospital center in New York is a typical example. RCP's have received a waiver which allows them to insert and administer intravenous steroids to acute asthmatic patients in the emergency room, a procedure which would normally be performed by a nurse or physician (Eicher, 1994).

Guidance on the educational preparation of respiratory care students was provided by Langfitt and Dource (1992) based on a critical analysis of the scope of practice and the past, present and future evolution of the respiratory care profession and its current education preparation changes. This was followed by Dunne, who challenged the American Association for Respiratory Care (AARC) to examine educational preparation and to formulate a strategic vision of where the respiratory care profession is headed. Additionally, he outlined various approaches for implementing educational changes and discussed the impact of this change on the other health care professions. ("AARC Education Concensus Conference") As a result, the AARC adopted "RCP 2001," which called for respiratory care practitioners to be both specialists and generalists (Dunne, 1992).

Overall, there will be modifications of the allied health work force to get people to do more things with fewer resources. Attention will be paid to multispecialties and combining positions, such as those of laboratory and
x-ray technicians. Baylor University Medial Center, for example, is instituting a cost-cutting program that involves reassigning and cross training house keeping and dietary personnel and trained nursing aides to take on duties that were previously performed by physical therapists. According to the American Organization of Nurse Executives, the trend to "cross-utilize" registered nurses to provide care to all patients within defined clusters is also growing. Cross-training and flexibility are key to the future. According to Hammers (1994), workers should have more than one specialty in which they are proficient, and they should be willing to work in more than one area. Cross-training is practiced routinely in other countries, as in Syria where there is lack of personnel (Gibbons, 1993), and may be seen in the near future in U.S. hospitals as they downsize to retain fiscal viability (Blayney, 1989).

**History of Multicompetency**

Historically, registered nurses served as the first multiskilled health practitioners. Until 1950, they provided care in areas now provided by respiratory care and pulmonary function, medical laboratory, radiography and tasks now associated with occupational and physical therapy. Medical corpsman personnel also performed multicompetent tasks in the physician assistant role after the Vietnam War (Blayney, 1989).

The concept of multicompetency flourished during the 1960's and 1970's when there were not enough graduating nurses to meet the tremendous explosion of knowledge and technology. Because of the lack of rigid licensure laws during this time, the use of cross-trained personnel was
encouraged, and many hospitals developed their own training programs, which led to the many currently recognized allied health professions. Unfortunately, there were no or few standards for quality care. This era of sophistication and specialization led to nurses relinquishing most of the basic allied health functions they had been performing. Medical assistants emerged in greater numbers as formally trained multiskilled personnel. Physicians supplemented formally educated medical assistants with their own on-the-job training. During this period, some rural health care facilities developed OJT (on-the-job training) programs as survival strategies to meet their individual needs for multiskilled practitioners (Blayney, 1989).

From 1970 to 1978, the United States became increasingly concerned with providing health care to rural areas. There was also an interest in prevention-oriented health care, hence the emergence of nontraditional health care institutions such as health care maintenance organizations and urgent health care centers. These trends led to an increase in the number of formal models for multiskilled health practitioner education, including hospital- and school-based programs (Blayney, 1989). There is a similar trend occurring in the 1990's; however the level of technology involved is much greater. Thus, entry-level education for new specializations usually requires formal education in an established allied health specialty. For example, sonography requires a license in addition to that which x-ray technology requires.

A 1979 survey of small hospitals by the American Medical Association (AMA) found that 42 percent of 250 respondents used multicompetent
personnel. A 1980 AMA survey of family medicine practitioners with one to two physicians found 70 percent of 703 respondents used multiskilled practitioners. The majority of respondents in both surveys indicated that the multiskilled personnel were taught the additional skills by on-the-job Training efforts (Blayney, 1989).

Literature has demonstrated that multicompetency is more likely to be practiced in small rural hospitals, specifically in those states that do not have licensure laws that would restrict practice in respiratory care, radiography and electrocardiography. Multicompetency has been used in rural hospitals, clinics and physician offices for over three decades in order to deliver cost effective care and to accommodate personnel shortages (Akroyd, Bamberg, Hall, 1992). This concept has also spread to medium- and large-sized hospitals and a variety of outpatient centers. There is also a need for multiskilled practitioners in long-term care facilities, nursing homes, health maintenance organizations, urgent and primary care centers and home health care (Blayney, 1989).

The need exists because a specialist cannot always be kept busy in one area, especially when the amount of time spent to perform skills outside the normal job description is 10 to 20 percent (Akroyd, Bamberg, Hall, 1992). The need for multicompetency may also develop through the evolution of new areas in health care which will come with significant structural changes as we become more of a chronic than acute system and more of a preventative than treating system.

Recent studies in metropolitan Philadelphia identified the need for
multicompetency in urban as well as rural areas, suggesting multicompetency is no longer strictly a phenomenon of the rural community. Urban settings are now using multicompetency personnel or expressing a desire to do so (Russel, 1991).

A 1987 survey of health maintenance organization (HMO) administrators found that 40 percent of the 55 respondents used multiskilled practitioners and that 24 to 51 percent of the staff were multiskilled practitioners. One of the most used combinations was personnel cross-trained in nursing and respiratory care. The study also surveyed the practitioners. Of the 320 responding, at least 80 percent of respiratory therapists indicated that at some time they felt the need to possess skills ordinarily outside their profession (Blayney, et al. 1989).

According to the American Hospital Association, 888 hospitals closed between 1980-1992, of which 642 were community hospitals. Experts predict as many as 200 more will close within the next decade, many as a result of inefficient human resource practices (Friedman, 1994). Alternatives to hospital care for the chronically ill are nursing homes and home health care. The Census Bureau reported that the nursing home population increased by 24 percent to 1.77 million during the 1980's. If patients are not within close proximity of the health care facilities, it will invariably put more responsibility on the care givers (Friedman).

With fewer dollars expected to be available for health care in the near future, smaller hospitals will transfer low-return intensive care unit patients to tertiary care centers, where such patients will be concentrated in fewer
units, but the total number will probably not change much as the aging population receives more rational and humane critical care (Cox, et al., 1987).

Such measures should not come as a surprise to any health care professional, from Maine to California, when major restructuring of their institutions' health care delivery system is done. Such changes may have profound effects on all facets of health care, including respiratory care. It will only be the blind or the stubborn who do not acknowledge the truth that radical change has to take place in health care. Those who do nothing and cannot justify their department positions and procedures will surely be eliminated or absorbed into other departments.

New business and new ways of doing business will be the hallmark of the successful hospital in the future, which may require an organizational structure previously foreign to the hospital (Koerner, 1991). In order for hospitals to survive in the next decade, they will have to do more with less and go the leaner and meaner route. Leaner translates into shortages of skilled allied health professionals and an increasing number of layoffs resulting from a stable or declining occupancy or external cost pressures (Friedman). Stagnant and inefficient hospitals will suffer, while innovative, efficient hospitals will prosper (Snyder, 1984).

To some extent, the effects of technology on the future of allied health are uncontrolled, and change will occur whether planned or not. Yet we are not entirely powerless in shaping the future (Cathcart, 1990). Professionals, educators and accrediting bodies may respond to proposed health care reform by (1) leading the band wagon and helping set directions, (2) jumping on the
bandwagon as it goes by, or (3) missing the parade altogether. In thinking about the future, it is important to separate what might happen from what we want to happen. We each have to have a strategic vision of where we think allied health should go. Strategic visions are enhanced by knowing both the personnel reduction strategies which will seek to use fewer personal and lesser-trained personnel where possible (Bezold, 1989).

A significant concern of most allied health professionals is that health reform may emphasize primary care over specialty care. Such assumptions are using the non-physician provider community to position itself for inclusion in the plan. These provider groups want to ensure that their services will be covered under the basic benefits package and that they are included on the primary care team (Eicher, 1994). Likewise, allied health professionals will have to redesign their roles and responsibilities and grow beyond their traditional structure if they are to meet society's mandate in the emerging reality of the 21st century. Each profession, however, cannot do it on its own, but must be a part of the whole.

According to an article in the National Board for Respiratory Care (NBRC) newsletter, New Horizons (Spring 1993), the health care practitioner of the future will be a cost-conscious proponent of health care in alternative sites, and demonstrate personal qualities such as critical thinking and problem-solving skills, and be able to make efficient and effective decisions (Scott, 1993). Change in the professional roles of respiratory care practitioners (RCP's) have been projected or proposed during the past year for the next decade to meet needs of the future. Educational changes will also have to be
made to meet expected roles.

**Advantages Meet Barriers**

It is clear that there is increased interest in the use of multiskilled health care practitioners. Trends in the future will no longer be on manpower expansion, but on an appropriate delivery of essential health care at a minimal cost (Garza, Evans, 1983). In our service-intensive nation, this means cutting down on the labor force (O'Daniel, et al.) In a survey of hospital administrators, 71 percent of respondents said the most important reason multicompetency is an advantage is its cost effectiveness; 56 percent said multicompetent personnel have greater versatility; and 53 percent mentioned coverage for absences as the most important advantage (Beachey, 1988).

The multicompetency approach is beneficial to the employee as well as the employer. The employee gains job diversity, increased responsibility, access to a larger job market and generally a higher salary. At the same time, this scenario presents a possible barrier in that higher salaries mean higher costs for the hospitals.

The concept of multicompetency has resulted in some failures and some successes. It is cost effective to utilize generalist personnel, competent in more than one discipline (Beachey, 1986). The more broadly trained the individual is, the more likely she is to find employment. Studies show that multiskilled personnel are more proactive in clinical laboratories in smaller hospitals or with 200 beds or less (Akroyd, Bamberg, Hall, 1992). Physicians are abdicating medical care to highly trained therapists, technologists and
physician assistants more and more. High tech respiratory care devices will hasten the process, and physicians will continue to know less about respiratory care, leaving more duties to therapists. This should improve overall skills of respiratory care and allow increased levels of responsibility.

However, the more specialized a professional is, the less a practitioner's services will be needed in a health system some 20 years down the line ("Multicompetency," 1993), a barrier likely to be noted by therapists and technicians. Also, as Cox (1987) notes, increased credential demands will force some people who do not possess specialized credentials out of the field.

Although a multicompetent therapist could be more efficient to a department, such a transition will call for higher levels of education. It is difficult to recruit students, and schools are not opening but closing, without trying to increase educational requirements for technicians from one to two years, or trying to change registry programs from two to four years. By simple virtue of the fact that more education entails more time and more money on behalf of students, and more resources on behalf of schools, it is likely that this will be identified as a top barrier. There is also the possibility that some technicians and therapists will not be competent enough to become multiskilled.

Many barriers have costs as their bottom line. Expenses involved in restructuring of departments, and possibly even the re-education of therapists and technicians, if they are retrained on the job, could affect hospital costs. To say that hospitals are under severe scrutiny in the area is quite an understatement. As U.S. Senator Paul Tongus put it at the 1993 national
AARC convention, "Health care costs will bankrupt this country if we keep going at the rate we are."

Many suspected barriers related to education are also cost-related. The economic reality of increasing formal education is that there will be fewer new resources made available to colleges and universities in the future. Schools have been faced with stagnant and declining fund bases for the past few years, and are going to have to find new resource bases in the future, especially to support new programs (Akroyd, Bamberg, Hall, 1992).

Also related to education is the possibility of over-complexity. Many allied health practitioners already feel that health care is getting so complex with new technology coming out everyday that specialists in their own field have a hard time keeping up, much less remain current with technology of other specialties. Quality assessment alone diminishes patient care time without trying to take on additional clinical demands created by multicompetency.

In addition to educational and cost barriers, barriers rooted in attitudes are expected to exist. For example, I would assume territorial issues between departments (e.g. nursing and respiratory care) be a given. There also seems to be an inane human resistance to change, so this could be a major hurdle in the restructuring of health care and educational departments and in getting collaboration from all groups involved.

Part of that restructuring will be related to licensure. In the last couple of decades there has been a steady push for formal education, credentialling and licensure to protect the public, maintain quality control and professional
recognition. With the way most licensure laws are written today, multicompetency would not be possible. This is possibly a significant barrier as there have existed "turf" wars between allied health specialties for years.

Multicompetency may also create confusion and frustration when two people from different specialties can perform the same function on a patient, and neither is aware if the other has already performed it or who is responsible for that function.

**Cohorts Defined**

The Certified Respiratory Therapy Technician (CRTT) is the entry-level credentialed professional for the respiratory care profession. The "work horse" of the profession, technicians perform the bulk of all the patient care in general areas throughout the hospital and may perform therapy in critical areas under the supervision of a Registered Respiratory Therapist.

The Registered Respiratory Therapist (RRT) is considered the advanced level practitioner and is the only other credential level in respiratory therapy. RRT's are responsible for performing all levels of care that CRTT's perform and are also responsible for performing care at a more advanced level in adult critical care or pediatric/neonatal care units where their expertise is required. If RRT's do not have the responsibility of critical patient care they usually have the function as supervisors or department managers and are sometimes found in the role as clinical instructors.

Respiratory care managers or respiratory care department directors are responsible for the total function of the department within the hospital. Some of the basic responsibilities include, but are not limited to, making and
maintaining a department budget, payroll, personnel schedules, personnel records, equipment inventory, department policies and procedures, personnel recruitment and interviewing, counselling and evaluation of personnel, liaison between respiratory care and other departments, quality assurance and equipment maintenance and attending hospital department meetings.

Respiratory care educators have the responsibility of teaching respiratory care to respiratory care students in the academic and hospital setting and performing student evaluations in both settings. Programs may be at the one-year certificate level to prepare students for the national Entry Level Examination administered by the NBRC. Education may also be at the associate's or bachelor's degree level to prepare advanced level practitioners for the Registered Respiratory Therapist examination administered by the NBRC. In addition to teaching respiratory care, educators are also responsible for maintaining all student academic and hospital records, making clinical schedules, counseling students, acting as a liaison between the college and the hospitals, and attending college advisory and clinical instructor meetings.

Cohort Attitudes Toward Multicompetency

As with any change, attitudes of those affected will play a role in how well a transition to multicompetency is completed and how well multicompetency works. This researcher expected all four cohorts to agree that multicompetency is desirable or will be an advantage to the respiratory care profession at this time or in the next decade. The cohorts were expected
to differ in their attitudes toward other perceptions of multicompetency such as the number and priority of other professions in which he or she feels the need to develop skills.

Technicians were expected to feel they should be multicompetent in fewer professions than the other cohorts with higher levels of education and greater degrees of responsibility. They were expected to feel that they should develop skills in two to three professions which are closely related to in their usual work environment.

Therapists were expected to have similar attitudes as to those of technicians, but would probably choose more professions in which they should develop skills, as their level of responsibility is greater and may bring them in contact with more allied health professions. Because therapists' level of education is greater than that of technicians, they may have a better understanding of the health care system and how other allied health departments are related to respiratory care in a broader perspective.

Managers, which may be either technicians or therapists, were expected to have similar views to the therapists, but would feel the need to develop skills in more professions because the scope of their job responsibilities brings them in contact with more allied health services. Also, as one of their responsibilities is to manage a department efficiently, they would see the department being managed more easily if the personnel could perform more than one job, especially if other professions were under the responsibility of the same manager. Educators of respiratory care, although sometimes removed from the hospital setting, were expected to view multicompetency
in a manner similar to managers. However, it should be noted that educators usually do not address issues until the need has been established within the medical community. Still, because research is part of education, educators were expected to be more aware of what future needs may come before managers and would therefore feel a greater need to become multicompetent in more professions than managers.

Because many skills in respiratory care are also sometimes considered nursing skills, it was expected that the majority of all four cohorts would feel the need to develop additional skills in nursing. As to which professions were more important to become multicompetent in, it was expected that each cohort would prioritize the professions depending upon the number of job skills in the profession that he or she feels are closely related to respiratory care.

It was assumed that those who had to change the most would harbor more negative attitudes. Certified technicians, because they did not possess a broad background knowledge, were considered less likely to obtain further schooling and perhaps be further credentialed. Registered therapists were considered likely to be more easily adaptable to additional responsibilities with a minimum of continuing education schooling.

Managers would have the headache of overseeing staff retraining and making sure their employees perform at a multicompetent level. And although they may have flexible staffs, managers would have to deal with territorial issues with other departments. Educators will be frustrated in that teaching additional multicompetency curriculum would dilute the quality
of programs because more skills would have to be taught in the same time period.

**Conclusion**

Multicompetency has been a long time in coming and will be a long time in implementation. Change in the health care system is inevitable. What significant changes will come about are still in question. However, we can shape the future of our profession to a degree. As health care is a team approach, there must also be a team approach if significant changes are going to take place in the responsibilities of the RCP. Identifying potential barriers to multicompetency is the first crucial step to making the transition a smooth, or at least, a less rocky one.

**Rationale and Purpose of Study**

A quasi-experimental research study on barriers to becoming a multicompetent respiratory care practitioner has been completed. The research is necessary because multicompetency will be necessitated for respiratory therapy practitioners, including technicians, therapists, managers and educators, by structural changes in the health care system. This change can take place more efficiently if barriers are identified so that allied health systems will be prepared to handle them.

An adequately prepared health care system should expend less cost and time in instituting change, and the efficiency and quality of care would be affected to a lesser degree during the transition period and beyond. Therefore, the results of this study will have an impact not only on practitioners, but on allied health departments, hospitals and ultimately the patients, who endure
the costs on both an economic and personal level.

While multicompetency has been explored in great detail by other researchers, information regarding barriers to multicompetency has been very limited. The rationale in surveying technicians, therapists, managers and educators is to garner input from all aspects of the respiratory care field, because all will contribute to the change, yet each will experience its own set of barriers.

Staff technicians and therapists, who deal most directly with patients, will see if and how changes directly affect their patients and themselves as professionals. Managers will view changes more from an administrative viewpoint. Meanwhile, educators who train technicians and therapists—including those who eventually become managers—will see how logistical obstacles and human limitations may enter the picture.

Statement of Hypotheses

The research began with the following hypotheses.
Hypothesis 1: The four cohort groups will identify significantly different barriers from a list of 11 potential barriers to multicompetency.

Hypothesis 2: Given a list of six potential barriers to multicompetency, the four cohort groups will prioritize them significantly differently from most to least important.

Hypothesis 3: Educators and managers, who hold greater levels of responsibility for direction of respiratory care (whether directly or indirectly) and who have achieved higher levels of education, will identify more barriers as opposed to technicians and therapists. Many of these barriers will embrace the "big picture," or all aspects of respiratory care, including educational, legal, professional organizations, human resources and patient care, as opposed to how changes will affect them personally.
Hypothesis 4: Educators will be more inclined to identify those potential barriers which are associated with the process of education and training of students.

Hypothesis 5: Managers will identify those potential barriers which may affect the restructuring process in the department to incorporate multicompetency.

Hypothesis 6: Therapists and technicians will be more inclined to identify those barriers which they will encounter on a daily basis in working with other allied health professionals such as overcoming traditional lines of distinction or "turf" among other health care disciplines.

Hypothesis 7: Technicians will differ in their choice of barriers from therapists by having resistance to required increased levels of education.

Hypothesis 8: Respondents from rural areas will identify fewer and different barriers than respondents from urban areas.

Hypothesis 9: Given a list of six potential barriers to multicompetency the rural and urban working communities will prioritize them differently most to least important.

Hypothesis 10: Given a list of six potential barriers to multicompetency the respiratory care practitioners with different levels of education will prioritize them differently from most to least important.

Method

Subjects

All subjects chosen for this research project were individuals working in the respiratory care profession. Four population groups were surveyed: certified respiratory care technicians, registered respiratory therapists, respiratory care managers and respiratory care educators. To obtain an
appropriate sample of the four populations, two subjects from each state for each of the four populations were chosen, creating a total sample of 400 subjects.

A certified respiratory care technician is defined by the American Association for Respiratory Care as someone who has graduated from at least a one-year technician program for respiratory care which has been approved by the Committee on Allied Health Education and Accreditation (CAHEA) of the American Medical Association and has passed the Entry Level Examination administered by the NBRC, the national organization which administers all respiratory care credentialing examinations. A registered respiratory therapist is defined by the AARC as a graduate of at least a two-year program in respiratory care approved by CAHEA who has passed the Advanced Written and Clinical Simulation examination administered by the NBRC.

As of December 31, 1992, the NBRC, established in 1960, has credentialled 109,761 certified respiratory care technicians; of this number, 47,764 were also registered respiratory therapists (registered respiratory therapists must first pass the Entry Level Examination before they can attempt the Advanced Practitioner Examination). The NBRC Directory lists all active, credentialled respiratory care personnel. Those practitioners who do not pay their annual dues with NBRC to keep their credentials active are not listed in the directory. Thus, the 1993 NBRC Directory has only 37,336 of all the credentials respiratory care practitioners.

The exact number of active certified technicians and therapists is not
listed; however, using the numbers given by NBRC for the total number of each of the above levels of practitioners, it can be estimated that 43.5 percent of the total credentialed practitioners were registered therapists. We can estimate that 16,241 of the active credentialed practitioners are registered respiratory therapists and the other 21,095 listed are certified respiratory care technicians. This estimation was checked by totalling the first three pages of active practitioners and determining the percentage of those being registered therapists. There were 648 active credentialed practitioners listed, of which 283, or 43.8 percent were registered respiratory therapists.

Both technicians and therapists were chosen from the directory in a random manner. The directory is organized alphabetically, with technicians and therapists mixed. A chart to the side of the names indicates the credentials. First, a list of all 50 states was compiled in a random manner. The order the states were listed was the order in which the researcher selected two subjects from each of the two categories. Starting with page one of the directory, the researcher chose the first technician listed for the first state. Starting at the top of the next page, the researcher selected the next subject as the next state was located. This process was repeated until a technician had been found for each state. The process was then repeated to find a second technician for each state in the same manner from the point in the directory from where the last technician was located. The same process was used for therapists.

Respiratory care managers were chosen in the same manner as were the technicians and therapists, except that an alphabetized national hospital directory was used instead of the NBRC directory. After hospitals were
chosen, telephone calls were made to the hospitals to obtain the names of their respiratory care managers.

Respiratory care educators were chosen in a similar manner, using the Winter 1993 Directory for Respiratory Therapy Education Programs accredited by the Committee on Allied Health Education and Accreditation of the American Medical Association in collaboration with the Joint Review Committee for Respiratory Therapy Education. The directory lists 365 respiratory care programs alphabetically by state, and includes the names of their directors. Directors were chosen from the first school listed for each state and from the school listed mid-way in each list. Many states had only two programs, of which both were used. Three states did not have a program and eight states only had one program, so fourteen more educators from the fourteen states with the largest number of programs was added by choosing the last program on each of their lists to bring the total to one hundred educators.

Instrument

To the extent of replication, the researcher duplicated Will Beachey's study, titled "Multicompetency Needs in Respiratory Care: Results of a Survey of Respiratory Therapy Alumni and Hospital Administrators," first published in Respiratory Care (Beachey, 1988). His study demonstrated whether respiratory care professionals perceived a need to be competent in other professions and what those areas would be. The duplication was done with Beachey's permission.

The instrument is a two-page (both sides of one page) survey questionnaire divided into three components: (1) general information about the respondent, (2) questions regarding respondents' perceptions about multicompetency needs and (3) questions regarding what respondents think
the barriers are to multicompetency. The survey questionnaire (Appendix A) consists of sixteen statements. All but two of the statements or questions require a check mark for the desired response. Respondents were requested to prioritize answers using numerical numbers from one to eight for one of these two questions and from one to six for the second of the two.

Questions or statements to be answered with check marks required from one to eleven responses. Two Yes/No questions obviously required only one response. A comment section was provided at the end of the instrument to enable the subjects to list any additional potential barriers to multicompetency which they felt were significant but were not addressed in the survey.

An introductory cover letter (Appendix B) accompanied the survey to explain the research study and encourage subjects to respond. It states that the research relates to potential changes, particularly multicompetency, that would affect them as respiratory care practitioners. A definition of multicompetency was provided in the event that some subjects were unfamiliar with the term.

The instrument was designed to fit on a single sheet of paper and to take only three to five minutes to complete, in order to maximize the number of responses. A self-addressed, stamped return envelope was provided, also to add to the response rate. Responses were anonymous.

The instrument was pretested in a pilot study, to establish its reliability and validity, by administering it to one first-year and one second-year respiratory therapy class at Alvin Community College in Alvin, Texas.
Additional validation of the instrument and feedback were obtained from an experienced professional colleague with many years of experience teaching respiratory care at a higher education institution (See Appendix A).

Measures

The barriers to multicompetency identified in the survey are dependent upon the persons who define those barriers. Therefore, the potential barriers and their prioritization represent the dependent variables, and the four subject groups--technicians, therapists, managers and educators--are the independent variables. Because the subject groups are categorized by their profession, the independent variables will collectively be referred to as "Professional Status." The following number codes will be used for each one: Certified Respiratory Therapy Technicians =1; Registered Respiratory Therapists =2; Respiratory Care Managers=3; and Respiratory Care Educators =4.

Survey questions were organized in a columnar manner in order to measure results. Each question or item requiring a response was designated with a column number. If a question or item had more than one response, a different number was designated for each of the responses. Forty-three columns were developed to measure the survey.

Column 1 indicates which cohort responded to each question, by their given code numbers, as described above, 1, 2, 3 or 4. Column 2 indicates which subjects within each cohort responded to each question. This is done by using the numbers from each individual survey as they were coded prior to being sent out.
Columns 3 through 10 each represent demographic information, as asked for in Section 1 of the survey. Column 3 indicates sex of the recipients, with 1 representing males and 2 representing females. Column 4 reveals the age groups of the respondents, with 1 indicating the 20- to 24-year-old age group, 2 indicating the 25-to 29-year-old group, 3 indicating the 30-to 34-year-old group, 4 indicating the 35- to 39-year-old group, and 5 indicating the over-40 age group. Column 5 was designated for the highest degree earned. A respiratory care certificate was indicated by 1, an associate degree was indicated by 2, a bachelor's degree was indicated by 3, a master's degree was indicated by 4 and a doctorate degree was indicated by 5. Column 6 was designated for the primary job responsibility of respondents. Staff technicians were designated as 1, staff therapists as 2, department managers as 3, instructors/educators as 4 and some other categories as 5. Column 7 was designated for the highest professional credential achieved. CRTT was indicated by 1 and RRT was indicated by 2. Column 8 represented the setting of the community in which respondents work. Urban was designated as 1 and rural was designated as 2. Column 9 tracked the type of institution where the subjects were employed. Hospitals were designated as 1, private home care agencies were designated as 2, rehabilitation facilities were designated as 3, educational institutions were designated as 4 and others were designated as 5. Column 10 tracked the number of hospital beds, for those subjects who worked in a hospital. Less than 100 was indicated by 1, 100 - 249 was indicated by 2, 250 - 499 was indicated by 3, 500 - 900 was indicated by 4, and more than 900 was indicated by 5.
Columns 11 to 26 were set up for Section II, relating to questions or statements on Perception of Multicompetency Needs. Column 11 was designated for Question A, "Do you feel that multicompetency is desirable or an advantage to the respiratory care profession at this time, or in the next decade?" "Yes" was designated by 1 and "No" was designated by 2. Columns 12 to 19 were designated for Question B, "If you did need to become multicompetent in your skills, in which other profession(s) would you feel the need...?" More than one choice could be made and subjects were asked to rank the choices in the order of importance. Each of the columns between 12 through 19 could have a number from 1 to 8 in it to designate each of the eight possible choices. If no response was made, a zero was designated. Column numbers were: 12 was for nursing, 13 for physical therapy, 14 for occupational therapy, 15 for radiologic technology, 16 for physician assistant, 17 for emergency medical technician, 18 for anesthesia assistant and 19 for other professions.

Column 20 was designated for Question C, "If multicompetency is required in respiratory care, at what level of education do you feel it should exist?" CRTT was designated by 1, RRT (associate degree in respiratory care) was designated by 2, RRT (bachelor's degree in respiratory care) by 3, and All Education Levels in Respiratory Care by 4. Column 21 tracked Question D, "If it would have been possible when you were a student, would you have enrolled in a baccalaureate degree program leading to multicompetency and/or credential eligibility for more than one profession?" The response of "Yes, if credentialling in two professions would have been possible" was
indicated by 1; the response of "Yes, if credentialing in one profession, plus
gaining skills (no credential) in another would have been possible" was
indicated by 2. "No" was designated by 3, and "I don't know" was designated
by 4.

Column 22 tracked Question E, "Do you feel more people will enter
respiratory care programs if the minimal level of education is increased to
achieve multicompetency?" "Yes" was represented by 1; "No" was
represented by 2. Columns 23 to 26 tracked responses to Question F, "If
increased levels of education are required to achieve multicompetency, how
do you feel it should be accomplished?" Column 23 was used to indicate the
response "On the job training," 24 was used to indicate the response
"Continuing education after graduation," 25 was used to indicate the response
"Tack on certificates at the associate degree level" and 26 was used to indicate
the response "Requirement of baccalaureate degree program in respiratory
care." For each possible response, if it was not chosen, a zero was entered; for
those which were chosen, a 1 was entered.

Columns 27 to 43 indicate responses to Section III, Barriers To
Multicompetency. Columns 27 to 37 indicate the responses to item III A,
"Check those items in the following list as to whether you feel they may be a
barrier to developing multicompetent respiratory care practitioners (RCP's)."
No response was indicated by 0; a check was indicated by 1. Question III B was
"Prioritize all of the following potential barriers to multicompetency."
Columns 38 to 43 indicate the responses to the question. Responses to the six
potential barriers were indicated with numbers from one through six in each
column.

Procedure

The 400 questionnaires were mailed out January 16, 1994. Subjects were given until February 10 to return the surveys. All were mailed at the same time, complete with a cover letter and a self-addressed stamped envelope.

The cover letter provided a rationale why the topic under investigation may be important to the subject, what the purpose of the investigation was and the subject was informed that he or she had been selected as one of two subjects from the four cohort groups to express their views on the subject being researched. Specific directions were to complete the survey by answering the questions in each section. Respondents were told that the survey could be completed in 3-to-5 minutes and to return it in the enclosed postage-paid envelope by February 10, 1994.

The surveys were identical and coded in order to identify all returned completed surveys and unforwardable ones returned by the Post Office. The surveys for each group were numbered 1 through 100 in an inconspicuous manner. The numbers were placed in a specific corner of each survey, dependent upon which cohort it was sent to, for easy categorization once the surveys were returned. Technician surveys were numbered in the upper left hand corner, therapists were numbered in the upper right hand corner, managers were numbered in the lower left hand corner and educators in the lower right corner. Thirteen of the four hundred surveys mailed were returned by the Post Office and alternates were chosen from the same states in the same manner as the initial 100 for each group.
Data Analysis

Descriptive statistics were analyzed using a tabulation table of frequencies and percentages on sixteen variables:

1. Sex
2. Age
3. Highest degree earned
4. Primary job responsibility
5. Highest credential earned
6. Setting of the community of work
7. Type of institution where employed
8. If employed in a hospital, number of beds
9. Six questions on perception of multicompetency
10. Two questions of barriers of multicompetency needs

An additional response was added for respondents to add additional barriers to multicompetency which they felt were significant and not listed on the questionnaire.

For inferential statistics, chi-square analyses were performed on the six questions from Part II on Perception of Multicompetency Needs. Results of each of the six questions were compared between the four groups. Results of the three chi-square analyses on how the different communities of work (urban and rural), the four cohorts and the different levels of education identified barriers from a list of eleven potential barriers to developing multicompetent respiratory care practitioners, were compared, analyzed and discussed concerning their significance. The three chi-square analyses were repeated and each of the 11 barriers was analyzed individually against the three variables indicated. A one-way analysis of variance was performed on
the four cohorts, the different communities of work and the five education levels and was compared against the eleven potential barriers. A chi-square analysis was performed on each of the six potential barriers to be prioritized in Item III B in the survey and compared against the four cohorts, the five levels of education and the two working communities (totaling 18 chi-square analyses in all). Results were summarized for each subject pool. Results of this survey allowed the researcher to compare and build on Beachey's survey, as he used the same analysis in his study.

This research design was developed with two main objectives. First, this design eliminated many factors which might have jeopardized the internal validity of the study. History and maturation problems were minimized since the survey period consisted of a relatively short three weeks; instrumentation and experimenter effects were eliminated since there were neither interviewers nor a post-survey; and selection bias was controlled as there were no experimental or control groups.

Results

At the completion of the study, N=198 (49.5%) of the respondents had returned the survey questionnaire. The data were then analyzed using a tables of frequencies and percentages, one-way analysis of variances (ANOVA) and chi-square analyses. The tables of frequencies and percentages were tabulated to establish the actual number of responses for each question on the survey questionnaires and the percentage that each response represented of the total responding to each question. The four cohort groups were examined and compared on the basis of their responses to eight demographic questions in section I of the survey. Demographic
questions, one through eight on the survey questionnaire (Appendix A), included information on sex, age, level of professional education, primary job responsibility, highest professional credential achieved, community work setting, type of institution in which the respondent was employed, and the number of hospital beds (for those respondents employed in a hospital).

The results of the data are presented in the order in which they appeared on the survey questionnaire. The analysis of the data is addressed according to the three categories of the questionnaire: General Demographic Data, Perception of Multicompetency Needs, and Barriers to Multicompetency. The data from the results for each question are presented and applied to each hypotheses in the discussion section. Of the 198 surveys returned, 34 (17.17%) were completed by respiratory technicians, 51 (25.76%) by respiratory therapists, 50 (25.25%) by managers and 63 (31.82%) by respiratory care educators (see Table 1). In response to Question A of the demographics section 113 (57.07%) of the respondents indicated they were male and 85 (42.93%) indicated they were female. In response to Question B of the demographics section of the survey, two (1.04%) of the respondents indicated they were between 20 to 24 years of age, four (2.07%) indicated they were between 25 to 29 year of age, 28 (14.51%) indicated they were between 30 to 34 years of age, 47 (24.35%) indicated they were between 35 to 39 years of age, and 112 (58.03%) indicated they were over 40 years of age. Five respondents did not answer the question. Analysis of the data showed that the majority of respondents from each of the four cohort groups were in the over 40 years of age category and that the response rate increased with age.
Table 1
Summation of Respondents' Demographic Data

<table>
<thead>
<tr>
<th>Survey Respondents</th>
<th>n</th>
<th>Percent of Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians</td>
<td>34</td>
<td>17.2%</td>
</tr>
<tr>
<td>Therapists</td>
<td>51</td>
<td>25.8%</td>
</tr>
<tr>
<td>Managers</td>
<td>50</td>
<td>25.3%</td>
</tr>
<tr>
<td>Educators</td>
<td>63</td>
<td>31.8%</td>
</tr>
<tr>
<td>Total</td>
<td>(N = 198)</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

Age of Survey Respondents

<table>
<thead>
<tr>
<th>Respondents' Age in Years</th>
<th>n*</th>
<th>Percent of Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 - 24</td>
<td>2</td>
<td>1.0%</td>
</tr>
<tr>
<td>25 - 29</td>
<td>4</td>
<td>2.1%</td>
</tr>
<tr>
<td>30 - 34</td>
<td>28</td>
<td>14.5%</td>
</tr>
<tr>
<td>35 - 39</td>
<td>47</td>
<td>24.6%</td>
</tr>
<tr>
<td>Over 40</td>
<td>112</td>
<td>58.0%</td>
</tr>
<tr>
<td>Total</td>
<td>(N = 193)</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

* = Five respondents did not answer the question.
### Table 1 (Continued)

**Highest Degree or Educational Level Achieved by Respondents**

<table>
<thead>
<tr>
<th>Highest Degree Earned</th>
<th>n*</th>
<th>Percent of Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Respiratory Care Certificate</td>
<td>24</td>
<td>12.4%</td>
</tr>
<tr>
<td>Associate Degree</td>
<td>61</td>
<td>31.4%</td>
</tr>
<tr>
<td>Bachelor's Degree</td>
<td>66</td>
<td>34.0%</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>40</td>
<td>20.6%</td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td>3</td>
<td>1.6%</td>
</tr>
<tr>
<td>Total</td>
<td>(N = 194)</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

* = Four respondents did not answer the question.

### Primary Job Responsibility of Respondents

<table>
<thead>
<tr>
<th>Job Responsibility</th>
<th>n*</th>
<th>Percent of Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Staff technician</td>
<td>4</td>
<td>7.3%</td>
</tr>
<tr>
<td>Staff therapist</td>
<td>2</td>
<td>16.6%</td>
</tr>
<tr>
<td>Department manager</td>
<td>60</td>
<td>31.1%</td>
</tr>
<tr>
<td>Instructor/Educator</td>
<td>67</td>
<td>34.7%</td>
</tr>
<tr>
<td>Others</td>
<td>20</td>
<td>10.4%</td>
</tr>
<tr>
<td>Total</td>
<td>(N = 193)</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

* = Five respondents did not answer the question.
Table 1 (Continued)

Type of Institution in Which Respondents Are Employed

<table>
<thead>
<tr>
<th>Employing Institution</th>
<th>n*</th>
<th>Percent of Total Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>126</td>
<td>64.6%</td>
</tr>
<tr>
<td>Private Home Care Agency</td>
<td>3</td>
<td>1.5%</td>
</tr>
<tr>
<td>Rehabilitation facility</td>
<td>1</td>
<td>0.5%</td>
</tr>
<tr>
<td>Educational Institution</td>
<td>57</td>
<td>29.2%</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
<td>4.1%</td>
</tr>
<tr>
<td>Total</td>
<td>(N = 195)</td>
<td>100.0%</td>
</tr>
</tbody>
</table>

* = Three respondents did not answer the question.
Results also showed an increased response rate was associated with a higher "professional status."

Data obtained from responses to Question C on the demographics section showed 24 (12.37%) respondents indicated the highest degree earned was a certificate in respiratory care, 61 (31.44%) respondents indicated the highest degree earned was an associate degree, 66 (34.02%) indicated a bachelor's degree, 40 (20.62%) indicated a master's degree, and three (1.55%) indicated a doctorate degree. Four subjects did not answer the question. Results showed a trend of increased response rate with increased levels of education. The trend does not go beyond the bachelor's degree, however (see Table 1).

Responses to Question D of the demographics section revealed 14 (7.25%) of the respondents indicated their primary job responsibility was a staff technician, 32 (16.58%) indicated their primary job responsibility was a staff therapist, 60 (31.09%) indicated their primary job responsibility was a department manager and 67 (34.72%) indicated their primary job responsibility was a respiratory care instructor or educator. Twenty respondents indicated some other primary job responsibility not listed on the survey. Five respondents did not indicate any primary job responsibility. Response rate increased with the level of job responsibility (see Table 1).

Responses to Question E of the demographics section of the survey revealed 45 (22.84%) of the respondents indicated the highest credential achieved in respiratory care as certified respiratory therapy technician, and 152 (77.16%) indicated registered respiratory therapist as the highest credential achieved. One respondent did not answer the question. Expectedly, the
majority of respondents had the highest credential in respiratory care, connecting increased years in the field to a higher concern for its future.

Responses to Question F of the demographics section of the survey revealed 124 (65.96%) of respondents indicating they worked in an urban community; 64 (34.04%) indicated they worked in a rural community. Ten respondents did not indicate the type of community in which they worked.

Responses to Question G of the demographics section of the survey revealed 126 (64.62%) respondents indicated they worked in a hospital, three (1.54%) indicated they worked in a private home care agency, one (0.51%) indicated he/she worked in a rehabilitation facility, 57 (29.23%) indicated they worked in an educational institution and eight (4.10%) indicated some facility other than those listed on the survey. Three respondents did not indicate the type of institution in which they were employed (see Table 1).

Question H of the demographics section asked respondents employed in a hospital to indicate the number of beds in the facility. Thirty-one (23.85%) of the respondents indicated less than 100 beds, 38 (29.23%) indicated 100-249 beds, 41 (31.54%) indicated 250-499 beds, 15 (11.54%) indicated 500-900 beds, and five (3.85%) indicated more than 900 beds. Sixty-eight respondents did not answer the question. The majority of respondents worked in hospitals with less than 500 beds.

Section II of the survey, Perception of Multicompetency Needs, included six questions numbered A through F. Each question is examined in alphabetical order. Question II A revealed that the majority of respondents, 176 (91.67%), stated "yes" they did feel that multicompetency is desirable or
an advantage to the respiratory profession at this time or will be in the next
decade. Sixteen (8.33%) of the respondents responded "no" to the question.
Six respondents did not answer question II A. This question was the only one
from the survey in which a large majority was in agreement. The data
obtained from Question II A, with regard to how the four cohorts responded,
were interpreted through the use of chi-square analysis which was statistically
significant at a 95% confidence level, with a chi-square of (3, N = 192) 11.387, p
= .0098. Results however, might be questionable because three cells of three
cohorts which stated "no" had an expected frequency of <5. However, the
total number of respondents which indicated there was no advantage to
multicompetency was only 16. The chi-square was also highly statistically
significant at a 99% confidence level when cohort groups 1 and 2 (technicians
and therapists), and 3 and 4 (managers and educators) were combined which
gave a chi-square of (1, N = 192) = 10.281, p = .0013. This suggested that all four
cohort groups agreed that multicompetency is desirable or an advantage to
the profession. By combining the cohort groups, all expected frequencies of
<5 were eliminated (see Table 2).

In response to Question II B, in which cohorts were asked if they did
need to become multicompetent in their skills, in which other profession(s)
would they feel the need? (They were asked to prioritize up to eight possible
choices). The number one profession chosen was nursing, with 74 (37.7%) of
all respondents choosing it. The second most frequent profession chosen by
the respondents was physician assistant, which 49 (24.75%) of respondents
chose. The third most frequent was anesthesia assistant and emergency
medical technician, both of which were chosen by 34 (17.17%) of respondents.
Table 2

Cohorts' Response to Whether Multicompetency is or Will Be Desirable or an Advantage to the Respiratory Care Profession

<table>
<thead>
<tr>
<th>Response</th>
<th>Technicians &amp; Therapists</th>
<th>Managers &amp; Educators</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>70 (39.8%)</td>
<td>106 (60.2%)</td>
</tr>
<tr>
<td>No</td>
<td>13 (81.2%)</td>
<td>3 (18.8%)</td>
</tr>
</tbody>
</table>

Total (N = 192)

Chi-Square = 10.281 with df = 1, p = 0.0013

*Technicians and therapists, and managers and educators had to be combined due to numerous cells having frequencies <5.

** Six respondents did answer the question.
The fifth most frequent response was other professions, with 18 (9.09%) of respondents choosing it. Sixth place was occupational therapy, chosen by 16 (8.08%) of respondents; seventh place was physical therapy, chosen by 14 (7.07%) of respondents; and last, or eighth place, was radiologic technology with 12 (6.06%) respondents choosing it. Eighteen respondents did not answer question II B (see Table 3).

Responses to Question II C, "If multicompetency is required in respiratory care, at what level of education do you feel it should exist?" revealed eight (4.23%) of the respondents indicating the level of education should be certified respiratory therapy technician; 50 (26.46%) respondents indicated that the level of education should be an associate degree in respiratory therapy; 52 (27.51%) respondents indicated a bachelor's degree in respiratory therapy; and 79 (41.80%) indicated at all education levels in respiratory care. Nine respondents did not answer the question.

The data obtained from responses to Question II C were interpreted through the used of a chi-square analysis. The effects were only statistically significant when cohort groups 1 and 2 and cohort groups 3 and 4 were combined due to five cells with expected frequencies <5. Chi-square analysis was statistically significant at a 95% confidence level with a chi-square of (3, N = 189) = 12.190, p = .0068, suggesting the majority of technicians and therapists felt multicompetency should exist at the CRTT level, which differed from managers and educators, who indicated it should exist at the bachelor's degree in respiratory care level (see Table 4). In regard to question II D, "If it had been possible when you were a student, would you have enrolled in a baccalaureate degree program, leading to multicompetency
Table 3

Professions Identified by Cohorts in Which RCPs Should Become Multicompetent

<table>
<thead>
<tr>
<th>Profession</th>
<th>Technicians</th>
<th>Therapists</th>
<th>Managers</th>
<th>Educators</th>
<th>Total n for Each Profession</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing</td>
<td>14</td>
<td>15</td>
<td>20</td>
<td>24</td>
<td>73</td>
</tr>
<tr>
<td>Physical Therapy</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Occupational Therapy</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Radiologic Technology</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Physician Assistant</td>
<td>5</td>
<td>15</td>
<td>13</td>
<td>15</td>
<td>48</td>
</tr>
<tr>
<td>Emergency Med.Tech.</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>Anesthesia Assistant</td>
<td>5</td>
<td>9</td>
<td>4</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>10</td>
<td>17</td>
</tr>
<tr>
<td>Total for each cohort</td>
<td>31</td>
<td>47</td>
<td>47</td>
<td>58</td>
<td>(N = 182)</td>
</tr>
</tbody>
</table>

* = All respondents were free to choose more than one skill.
Table 4

**Cohorts' Response Regarding the Level of Education at Which Multicompetency Should Exist in Respiratory Care**

<table>
<thead>
<tr>
<th>Education Levels at Which Multicompetency Should Exist</th>
<th>Technicians &amp; Therapists</th>
<th>Managers &amp; Educators</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRTT**</td>
<td>6 (75%)</td>
<td>2 (25%)</td>
</tr>
<tr>
<td>RRT*** with A.S. Degree</td>
<td>19 (38%)</td>
<td>31 (62%)</td>
</tr>
<tr>
<td>RRT with B.S. Degree</td>
<td>15 (28.9%)</td>
<td>37 (71.2%)</td>
</tr>
<tr>
<td>All Education Levels in Respiratory Care</td>
<td>43 (54.4%)</td>
<td>36 (45.6%)</td>
</tr>
</tbody>
</table>

(N= 189)

Chi-Square = 12.190, with df = 3, p = 0.0068

* Nine respondents did not answer the question.

**CRTT = Certified Respiratory Therapy Technician

***RRT = Registered Respiratory Therapist

Technicians and therapists, and managers and educators were combined due to numerous cells with frequencies of <5.
and/or credential eligibility for more than one profession?", a majority of 117 (62.57%) subjects responded with "yes" they would if credentialing in two professions would have been possible, 20 (10.70%) indicated "yes", if credentialing in one profession, plus gaining skills (no credential) in another would have been possible, 20 (10.70%) indicated "no" and 30 (16.04%) indicated they "did not know." Eleven respondents did not answer the question. The data obtained from question II D were interpreted through the use of a chi-square analysis. Expected frequencies of <5 were found in four cells. Cohort groups 1 and 2 and cohort groups 3 and 4 were then combined. There was no statistically significant difference at the 95% confidence level showing there was no association between the four cohorts and their indication that they would have chosen to enroll in a baccalaureate degree program leading to multicompetency, had the programs existed when they were students.

Responses to Question II E were "yes" or "no" as to whether the respondents felt more people will enter respiratory care programs if the minimum level of education is increased to achieve multicompetency. Ninety-one (47.15%) respondents indicated "yes" and 102 (52.85%) indicated "no". Five respondents did not answer the question. The data obtained from the responses to Question II E were interpreted through the use of a chi-square analysis. There was no statistically significant difference at a 95% confidence level. Cohort groups 1 and 2 and cohort groups 3 and 4 were combined and another chi-square analysis was run showing again there was no statistically significant difference between the groups.
To Question II F, "If increased levels of education are required to achieve multicompetency, how do you feel it should be accomplished?", thirty-six (18.18%) of responses indicated on-the-job training, 71 (35.86%) indicated continuing education after graduation; 67 (33.84%) indicated tack on certificates at the associate degree level; and 75 (37.88%) indicated that multicompetency education should be a requirement of baccalaureate degree programs in respiratory care. Data obtained from the responses were interpreted through the use of a chi-square analysis test of each response. The first response, on-the-job training, was highly statistically significant at a 99% confidence level, with a chi-square of (3, N = 198) = 18.025, p = .0004, which suggests that technicians strongly felt on-the-job training is how increased levels of education should be accomplished for multicompetency. This feeling was not exhibited by the other three cohorts (see Table 5). On the second response, continuing education after graduation, a chi-square analysis at 95% confidence level was not statistically significant. On the third response, tack on certificates at the associate degree level, a chi-square analysis was also not statistically significant. For last response, requirement of baccalaureate degree program in respiratory care, a chi-square analysis was statistically significant at a 97.5% confidence level with a chi-square of (3, N = 198) = 9.693, p = .0214, which suggests there was a difference in the opinions of educators and managers, both of whom felt that multicompetency education should be a requirement of the baccalaureate degree program in respiratory care as contrasted with technicians and therapists who did not concur (see Table 5).
Table 5
Cohorts' Response to How to Increase Levels of Education in Order to Achieve Multicompetency

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>Technicians</th>
<th>Therapists</th>
<th>Managers</th>
<th>Educators</th>
<th>Total (N=198)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On-the-Job Training</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>20 (58.8%)</td>
<td>42 (82.3%)</td>
<td>41 (82%)</td>
<td>59 (93.7%)</td>
<td>162 (81.8%)</td>
</tr>
<tr>
<td>Yes</td>
<td>14 (41.2%)</td>
<td>9 (17.7%)</td>
<td>9 (18%)</td>
<td>4 (6.3%)</td>
<td>36 (18.2%)</td>
</tr>
<tr>
<td><strong>Bachelor's Degree</strong>*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>28 (82.4%)</td>
<td>34 (66.7%)</td>
<td>26 (52.0%)</td>
<td>35 (55.6%)</td>
<td>123 (22.1%)</td>
</tr>
<tr>
<td>Yes</td>
<td>6 (17.7%)</td>
<td>17 (33.3%)</td>
<td>24 (48.0%)</td>
<td>28 (44.4%)</td>
<td>75 (37.9%)</td>
</tr>
</tbody>
</table>

*Chi-Square = 18.025, df = 3, p = 0.0004

**Chi-Square = 9.693, df = 3, p = 0.0214
The Barriers to Multicompetency, Section III of the survey, included three items identified as A, B and C. Each item was examined in alphabetical order. Item III A asked respondents to select from a list of 11 potential barriers, those which they felt may be a barrier to developing multicompetent respiratory care practitioners. One hundred thirty-three (67.17%) of the respondents selected complexity and diversity of restructuring allied health care and getting collaboration of other allied health care profession educators, professional organizations and employers to identify a common professional core and to develop a standard for multicompetency. One hundred sixty-seven (84.34%) selected overcoming traditional lines of distinction or "turf" among other health care disciplines, making this the most popular barrier. Thirty-nine (19.70%) selected economic trends in the health care industry. Twenty-six (13.13%) selected cost effectiveness of multicompetent RCPs. Thirty-four (17.17%) selected need for multicompetent RCPs in all hospitals. Thirty-three (16.67%) identified job satisfaction and multicompetent RCPs. One hundred twenty-five (63.13%) identified attitudes toward change in the professional role and training as a barrier. Twenty-five (12.63%) identified recruitment for multicompetent RCP training programs, making it the least-selected barrier. Eighty-two (41.41%) identified legitimacy of respiratory care in some states which do not have licensure. One hundred four (52.53%) identified capacity of all RCPs to become multicompetent and/or handle the rigor of advanced level of higher education. Sixty-seven (33.84%) identified vision of what allied health will become in the next decade (see Table 6).
<table>
<thead>
<tr>
<th>Potential Barriers to Multicompetency</th>
<th>n</th>
<th>Percent of 198 Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complexity and diversity of restructuring allied health care and getting collaboration of other allied health care profession educators, professional organizations and employers to identify a common professional core and to develop a standard for multicompetency.</td>
<td>133</td>
<td>67.2%</td>
</tr>
<tr>
<td>Overcoming traditional lines of distinction or &quot;turf&quot; among other allied health care disciplines.</td>
<td>167</td>
<td>84.3%</td>
</tr>
<tr>
<td>Economic trends in the health care industry.</td>
<td>39</td>
<td>19.7%</td>
</tr>
<tr>
<td>Cost effectiveness of multicompetent RCPs.</td>
<td>26</td>
<td>13.1%</td>
</tr>
<tr>
<td>Need for multicompetent RCPs in all hospitals.</td>
<td>34</td>
<td>17.1%</td>
</tr>
<tr>
<td>Job satisfaction and multicompetent RCPs.</td>
<td>33</td>
<td>16.7%</td>
</tr>
<tr>
<td>Attitudes toward change in the professional role and training.</td>
<td>125</td>
<td>63.1%</td>
</tr>
<tr>
<td>Recruitment for multicompetent RCPs training programs.</td>
<td>25</td>
<td>12.6%</td>
</tr>
<tr>
<td>Legitimacy of respiratory care in some states which do not have licensure.</td>
<td>82</td>
<td>41.4%</td>
</tr>
<tr>
<td>Capacity of all RCPs to become multicompetent and/or handle the rigor of advanced level of higher education.</td>
<td>104</td>
<td>52.5%</td>
</tr>
<tr>
<td>Vision of what allied health will become in the next decade.</td>
<td>67</td>
<td>33.8%</td>
</tr>
</tbody>
</table>
Regarding the total number of barriers chosen, forty-eight (25.00%) of respondents chose four barriers, 36 (18.75%) chose three barriers, 35 (18.23%) chose five barriers, 33 (17.19%) chose six barriers, 18 (9.37%) chose two barriers, 11 (5.73%) chose seven, six (3.12%) chose one, two (1.04%) chose eight and three (1.56%) chose nine. None of the respondents chose more than nine potential barriers. Six respondents did not choose any barriers (see Table 7).

The data from the responses to item III A, with regard to the communities of work and which barriers were chosen were interpreted through the use of a chi-square analysis test at a 95% confidence level. Because the cell counts were <less 5 for the expected frequency for numerous cells, barriers 1 and 2, and 7, 8, 9, 10, and 11 were combined. There was no statistical significance and/or difference between barriers chosen by the rural and urban communities.

A one-way analysis of variance (ANOVA) was conducted to analyze the relationship of communities of work and the number of barriers chosen. Results of the analysis were nonsignificant. The mean number of barriers chosen was 4.194 with a median of 4.0 for the urban community. The mean was 4.297 for the rural community, which also had a median of 4.0, showing no difference in numbers.

The data obtained from item III A in regard to which barriers were chosen by the four cohort groups were interpreted through the use of a chi-square analysis test. Because expected frequencies were <5 in numerous cells, barriers 1 and 2 and 7, 8, 9, 10 and 11 were combined. The test was statistically non-significant at a 95% confidence level, indicating there was no difference
Table 7

Average Number of Barriers Chosen by Cohorts

<table>
<thead>
<tr>
<th>Number of Barriers Chosen</th>
<th>n*</th>
<th>Percent of 198 Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>18</td>
<td>9.4%</td>
</tr>
<tr>
<td>3</td>
<td>36</td>
<td>18.8%</td>
</tr>
<tr>
<td>4</td>
<td>48</td>
<td>25.0%</td>
</tr>
<tr>
<td>5</td>
<td>35</td>
<td>18.2%</td>
</tr>
<tr>
<td>6</td>
<td>33</td>
<td>17.2%</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>5.7%</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>1.0%</td>
</tr>
<tr>
<td>9</td>
<td>3</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

None of the respondents chose more than nine barriers.

* = Six respondents did not choose any barriers.
between the four cohort groups and the barriers they chose.

A one-way analysis of variance (ANOVA) was conducted to analyze the relationship of the four cohort groups and the number of barriers chosen. The results of the analysis were nonsignificant showing no difference in the number of barriers chose between the four cohort groups. The four cohort groups chose a median of 4.0 barriers. Respondents from different cohort groups chose, on average, the same number of potential barriers as those from urban and rural communities.

The data obtained from responses to item III A, with regard to educational level and the barriers chosen; were interpreted through the use of a chi-square analysis. Because expected frequencies were <5 in numerous cells, barriers number 1 and 2, and 7, 8, 9, 10 and 11 were combined. Because expected frequencies were still <5 in numerous cells, the educational levels 1 (certificate in respiratory care) and 2 (associate degree), and 3 (bachelor's degree), 4 (master's degree) and 5 (doctorate degree) were combined. The effects were statistically non-significant at a 95% confidence level.

A one-way analysis of variance (ANOVA) was conducted to analyze the relationship of the levels of education and the number of barriers chosen. Results showed respondents from different levels of education also chose plus or minus four barriers. Even when education levels 1 and 2, and 3, 4, and 5 were combined, results for the mean number of barriers chosen showed similar values. The test was not statistically significant at a 95% confidence.

The data obtained from responses to Item III A were compared to which potential barriers were selected from the communities of work. The
results were interpreted through the use of a chi-square analysis. The only barrier which was statistically significant was potential barrier number 4 on the questionnaire, cost effectiveness of multicompetent RCPs. Results were significant at the 97.5% confidence level with a chi-square of \( (1, N = 188) = 5.686, p = .0171 \), indicating that cohorts who worked in the urban community felt multicompetent personnel would not save money as compared to those working in rural areas who indicated otherwise (see Table 8).

When each of the 11 barriers was analyzed as to which of the four cohorts selected it, the results were statistically nonsignificant for all of the 11 potential barriers at the 95% confidence level. Potential barrier number 7, attitude toward change in the professional role and training, should be mentioned however, as the results of its chi-square analysis was \( (3, N = 198) = 7.237, p = .0647 \), showing the association approached significance. This suggests there may be an effect of the cohort groups therapists, managers and educators on attitudes toward change in the professional role and training. They indicated this could be a potential barrier, as compared to technicians who did not concur to a significant degree. The data obtained from responses to item III A, with regard to levels of education and which barriers they chose, were interpreted through the use of a chi-square analysis. There was no statistical significance at the 95% confidence level for all 11 barriers.

Responses to Item III B, which asked respondents to prioritize six potential barriers to multicompetency, starting with number one as being the greatest and number as six being the least were tabulated. All respondents
Table 8
Cohorts' Response to Barriers of Cost Effectiveness of Multicompetent RCPs Based Upon Respondents' Community of Work

<table>
<thead>
<tr>
<th>Chose Cost Effectiveness of Multicompetency as a Barrier</th>
<th>Setting of Working Community*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Workers</td>
<td>Rural Workers</td>
</tr>
<tr>
<td>No</td>
<td>103 (83.0%)</td>
</tr>
<tr>
<td>Yes</td>
<td>21 (17.0%)</td>
</tr>
</tbody>
</table>

Total (N = 188)
Chi-Square = 5.686, with df = 1, p = 0.0171
* Ten respondents did not answer the question.
answered the question. Sixty-nine (34.85%) chose territorial issues as the
greatest barrier. Forty-seven (23.74%) of respondents chose respiratory care
practitioners' resistance to required levels of education as the second greatest
barrier. Forty-five (22.73%) of respondents chose access to increased levels of
education as the third greatest barrier. Thirty-seven (18.69%) of respondents
chose, Increased salaries for increased levels of education as the fourth
greatest barrier. Licensure issues, although it could be classified as the fifth
greatest barrier with thirty (15.15%) of respondents choosing it, was also the
mean number or percent for the first, second, third and fourth choice of
respondents who chose it. Seventy-three (36.87%) of respondents chose
licensure issues as the least important barrier. Twelve respondents did not
answer the question (see Table 9).

Each of the four cohort groups were compared to how they prioritized
each of the six barriers in Item III B. The data obtained from Item III B were
analyzed through the use of chi-square analysis tests. Only one of the six
potential barriers, barrier number two, manpower shortage, was considered
statistically significant when the effect of the four cohort groups was tested.
Results were statistically significant at the 95% confidence level with a chi-
square of \( 15, N = 186 \) = 39.596, \( p = .0005 \), showing educators and managers
felt that manpower shortage would be a barrier, technicians and therapist
however, indicated its priority to a much lesser degree (see Table 10).

The four cohort groups were compared for their opinions on the most
important potential barrier. A chi-square analysis test was statistically
significant at the 95% confidence level; however, the test was not reliable
Table 9
Summary of How Cohorts Prioritized Potential Barriers

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
<th>P6</th>
<th>Total n of Respondents**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians</td>
<td>6</td>
<td>8</td>
<td>1</td>
<td>3</td>
<td>9</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>Therapists</td>
<td>7</td>
<td>2</td>
<td>8</td>
<td>5</td>
<td>15</td>
<td>12</td>
<td>49</td>
</tr>
<tr>
<td>Managers</td>
<td>13</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>17</td>
<td>4</td>
<td>49</td>
</tr>
<tr>
<td>Educators</td>
<td>7</td>
<td>2</td>
<td>8</td>
<td>5</td>
<td>26</td>
<td>7</td>
<td>55</td>
</tr>
</tbody>
</table>

Number of times mentioned 33 13 25 19 67 29 186

* P1 = Access to increased levels of education
  P2 = Manpower shortage
  P3 = Respiratory care practitioner resistance to required increased levels of education
  P4 = Increased salaries for increased levels of education
  P5 = Territorial issues
  P6 = Licensure issues

** Ten respondents did not answer the question.
Table 10

Cohorts' Prioritization of the Potential Barrier, Manpower Shortage

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
<th>P6</th>
<th>Total n of Respondents**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians</td>
<td>8</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>6</td>
<td>6</td>
<td>33</td>
</tr>
<tr>
<td>Therapists</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>13</td>
<td>16</td>
<td>49</td>
</tr>
<tr>
<td>Managers</td>
<td>1</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>7</td>
<td>28</td>
<td>49</td>
</tr>
<tr>
<td>Educators</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>19</td>
<td>22</td>
<td>57</td>
</tr>
<tr>
<td>Total n</td>
<td>13</td>
<td>12</td>
<td>18</td>
<td>26</td>
<td>45</td>
<td>72</td>
<td>186</td>
</tr>
</tbody>
</table>

Chi-square = 39.596, with df = 15, $p = 0.0005$

* P1 = Access to increased levels of education
  P2 = Manpower shortage
  P3 = Respiratory care practitioner resistance to required increased levels of education
  P4 = Increased salaries for increased levels of education
  P5 = Territorial issues
  P6 = Licensure issues

** Ten respondents did not answer the question.
with six cells having expected frequencies of <5. Cohort groups 1 and 2 and cohort groups 3 and 4 were then combined and another chi-square analysis was performed. Results of another chi-square analysis were statistically significant with a chi-square of \((5, N = 186) = 12.336, p = .0304\), indicating there was effect between the four cohort groups combined, in that managers and educators felt territorial issues would be the most important barrier versus technician and therapists who also prioritized it as number one but to a significant lesser degree (see Table 11).

The four cohort groups were also compared for their opinions on the least important potential barrier. A chi-square analysis test was not significant at the 95% confidence level, however there were seven cells with expected frequencies of <5. When cohorts 1 and 2 and cohorts 3 and 4 were combined another chi-square analysis was done. Results were again statistically nonsignificant at the same level.

A chi-square analysis was performed to compare the most important barrier associated with the community of work. Results of the test were statistically nonsignificant at the 95% confidence level. A chi-square analysis was also performed to compare the least important barrier associated with the community of work. Results were statistically nonsignificant at the 95% confidence level. Levels of education and prioritization of each barrier from one to six were compared through use of a chi-square analysis test. Doctorate and master's degree levels were combined due to too few cells. Results were statistically not significant for all six barriers, suggesting no association between the five levels of education and the prioritization of the barriers.
Table 11
Cohorts' Selection of Most Important Potential Barrier

<table>
<thead>
<tr>
<th>Cohorts</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
<th>P4</th>
<th>P5</th>
<th>P6</th>
<th>Total n of Respondents**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technicians &amp; Therapists</td>
<td>13</td>
<td>10</td>
<td>9</td>
<td>8</td>
<td>24</td>
<td>18</td>
<td>82</td>
</tr>
<tr>
<td>Managers &amp; Educators</td>
<td>20</td>
<td>3</td>
<td>16</td>
<td>11</td>
<td>43</td>
<td>11</td>
<td>104</td>
</tr>
<tr>
<td>Total</td>
<td>33</td>
<td>13</td>
<td>25</td>
<td>19</td>
<td>67</td>
<td>29</td>
<td>186</td>
</tr>
</tbody>
</table>

Chi-square = 12.336, with df = 5, p = 0.03

* P1 = Access to increased levels of education
  P2 = Manpower shortage
  P3 = Respiratory care practitioners resistance to required increased levels of education
  P4 = Increased salaries for increased levels of education
  P5 = Territorial issues
  P6 = Licensure issues

** Ten respondents did not answer the question.
Levels of education and the barriers ranked most important were compared. Doctorate and master's degree levels were combined due to too numerous cells with expected frequencies of <5. Results of the chi-square analysis were statistically nonsignificant at the 95% confidence level. Levels of education for groups 1 and 2, and groups 3, 4 and 5 were combined. Another chi-square analysis was done. Results were statistically significant at the 95% confidence level, with a chi square of \((5, N = 182) = 11.897, p = 0.037\). There was association between the education levels and the ranking of the most important barrier. The combined levels of bachelor's, master's and doctorate degrees indicated that territorial issues was the most important barrier by a two-to-one margin over the combined certificate and associate degree group, even though it was also their most important choice (see Table 12). An interesting piece of data from this chi-square analysis was that the technician and therapist group felt significantly differently about barrier number 2, manpower shortage, in that they indicated it as being much higher priority than did the higher education level group by a 10 to three margin.

Levels of education were compared to the least desirable barrier and results of chi-square analysis showed no statistical significance, even when levels 1 and 2 and levels 3, 4 and 5 were combined.
Table 12
How Cohorts of Different Educational Levels Prioritized Potential Barriers

<table>
<thead>
<tr>
<th>Education Levels</th>
<th>Most Important Potential Barriers</th>
<th>Total n of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>P1</td>
<td>P2</td>
</tr>
<tr>
<td>RC** Certificate</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>&amp; Associate Degree</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor's</td>
<td>19</td>
<td>3</td>
</tr>
<tr>
<td>Master's and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Doctorate Degree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Chi-Square = 11.897, with df = 5, p = 0.037

* P1 = Access to increased levels of education
  P2 = Manpower shortage
  P3 = Respiratory care practitioner resistance to required increased levels of education
  P4 = Increased salaries for increased levels of education
  P5 = Territorial issues
  P6 = Licensure issues

** RC = Respiratory Care

*** Sixteen respondents did not answer the question.
Discussion

This research was based on the premise that barriers to multicompetency exist and the study addresses a potential challenge to the health care community which may become a reality in the near future. I believe that the results of this study, although limited in their significance, will be helpful because little information exists in the literature to guide, not just respiratory care, but all allied health care professionals in identification of potential barriers to achieving multicompetency.

Hypothesis 1 is not supported by the research. No significant difference existed in the results of the barriers chosen by the technician, therapist, manager and educator populations. A summation of the data from an ANOVA of the four cohorts and which barriers they chose supports this conclusion. The ANOVA demonstrated that all four cohorts chose a mean of only slightly greater than four and a median of four barriers. Although the chi-squares were not significant, one barrier deserves mention as it was almost significant when each of the eleven barriers were associated separately with the four cohorts. The barrier, attitudes toward change in the professional role and training, showed a chi-square of 0.0647, indicating there was almost a significant difference between technicians not feeling that attitudes toward change was a barrier, and the other three cohorts who did feel it was a significant barrier. Overall, this barrier ranked third out of 11 barriers.

Some important information did result from Question IIIA. Barriers were prioritized collectively from all four cohorts. The most popular barrier was, overcoming traditional lines of distinction, or "turf" among other health
care disciplines, with 167 (84.34%) choosing it. Chosen second in frequency was complexity and diversity of restructuring allied health care profession educators, professional organizations and employers to identify a common professional core and to develop a standard for multicompetency. The third most popular has already been indicated. The fourth most popular was the capacity of all RCPs to become multicompetent and/or handle the rigor of pursuing advanced levels of higher education. The least popular barrier was recruitment for RCP training programs. There was agreement to the other barriers but not to the significance of the first four mentioned. Using these priorities could be a starting point for further research.

Hypothesis 2 is only weakly supported by the research. There was no supportive evidence to suggest that the four cohorts prioritized the six potential barriers differently from most to least important. However, results were statistically significant and there was evidence to show that after cohort groups 1 and 2 and 3 and 4 were combined a chi-square analysis showed that managers and educators chose "territorial issues" as the fifth least important barrier to a far greater degree than did technicians and therapists. A possible explanation is that educators and managers are not usually involved in day to day contact with patients and do not encounter the same problems that technicians and therapists have.

Hypothesis 3 is not supported by the research. No significant difference existed between the educators and managers, who hold greater levels of responsibility for direction of care, and the therapists and technicians in the number of barriers that they chose.
Hypothesis 4 is only weakly supported by the research. Educators only identified four of what the researcher considered seven potential barriers associated with the process of education. The numbers were consistently high for four of the barriers: (1) economic trends in the health care industry, (2) cost effectiveness in multicompetent RCPs, (3) need for multicompetent RCPs in all hospitals and (4) job satisfaction and multicompetent RCPs.

Hypothesis 5 is weakly supported by the research. Managers, like educators, identified only four of what this researcher considered seven potential barriers associated with management. Also like educators, the number of respondents choosing four barriers was high.

Hypothesis 6 is weakly supported by the research. Although the chi-square analysis was not statistically significant, the summary of the barriers show technicians and therapists chose two barriers to a greater degree than did educators and managers. Both technicians and therapists indicated that overcoming traditional lines of distinction or "turf" among other health care disciplines was a more significant potential barrier than educators and managers indicated. This was indicated by the greater number of responses. The first barrier, complexity and diversity of restructuring allied health care and getting collaboration of other allied health care profession educators, professional organizations and employers to identify a common professional core and to develop a standard for multicompetency, was only of concern to technicians and not to any of the other cohorts. Still it is interesting to note that much comment was received on the surveys which relates to both the aforementioned barriers. One respondent wrote that any bill proposed
regarding multicompetency would encounter legislative blockage from physicians, nurses and physical therapists unless they endorsed the proposal. Related to this were written concerns about physician acceptance of multicompetency. It was stated that some physicians may lose reimbursement for procedures they relinquish to multicompetent therapists who can perform them at a reduced price to the patients.

Hypothesis 7 is not supported by the research. There was no statistically significant evidence to show that technicians differ in their choice of barriers from therapists by having increased resistance to required increased levels of education.

Hypothesis 8 is not supported by the research. Analysis of the data revealed no statistically significant difference when comparing the urban and rural communities and the number of barriers they chose. A summation of the data from an ANOVA of the two communities and the number of barriers they chose supports this conclusion. The data showed the mean of slightly greater than 4, and a median of 4 for the potential barriers chosen by both communities. A question to consider is whether the results would have been similar if there had not been such a disparity in the sample populations, 64(34.04%]. With the mean and median being so close, it is doubtful that this would have changed significantly if the sample populations had been equal for both communities.

Data was statistically significant when urban and rural communities considered the potential barrier of cost effectiveness of multicompetent RCPs. The urban community indicated that it would not save money, and the rural
community indicated otherwise. The results were at a 97.5% confidence level. Although the potential does exist that multicompetency may not present cost savings in certain areas, Blayney (1989) believes its greatest benefit is that it will save costs. These results are also in line with the other literature cited early in this research indicating multicompetency has existed for more than three decades at some level in the small rural hospitals, primarily for the reason in question.

Hypothesis 9 is not supported by the research. There was no statistically significant evidence to suggest that rural and urban working communities prioritized the six potential barriers differently.

Hypothesis 10 is weakly supported by the research. Level 4 (master’s degree) and level 5 (doctorate degree) had to be combined as level 5 only had 3 cells. Although the chi-square was not statistically significant for the prioritization of the potential barriers as compared to the five levels of education, it was statistically significant when the levels 1 (respiratory care certificate) and 2 (associate degree) were combined, and 3 (bachelor’s degree), 4 (master’s degree) and 5 (doctorate) were combined and compared as to which potential barrier they felt was the most significant. Higher levels of education, 3, 4 and 5 indicated "territorial issues" as the fifth most important barrier, significantly more than did educational levels 1 and 2.

Numerous potential barriers to multicompetency not listed in the survey were identified by respondents, and should be mentioned as future researchers may want to consider them as they are developing their instruments. Particularly vocal were the therapists and technicians. Among the potential barriers they presented, many were related to professional
morale. At least one therapist and one technician responded that an increased work load accompanied by little or no increase in pay would not be acceptable. Likewise, one therapist responded that the increased levels of education required for multicompetency with little or no salary increase would also not be acceptable. Also related to the issue of morale is the possibility of the image of the respiratory therapy professional suffering because multicompetency could entail lower-level skills. One respondent even expressed fear of having to perform bed-pan duties. Other respondents pointed to job competition as a possibility due to hospital downsizing and restructuring.

A major concern which kept surfacing was misinterpretation of "multicompetency." Some respondents indicated that the lack of definition or understanding of multicompetency was a barrier and that if its definition could be standardized, then licensure and territorial issues could be resolved. One educator indicated that reaching a consensus opinion of what skills are included in multicompetency and also its credentialling will be a barrier on a state and even to a greater degree on a national level. A lack of uniformity of educational programs offering multicompetency programs would also have to be addressed, according to one respondent.

It was expressed that the emphasis on respiratory care would be decreased with multicompetency, resulting in diminished quality of patient care due to an increase in job responsibility. Also, personal limitations in performing all functions could result in the diminishment of quality care.

Lack of unity between the hospitals, physicians, hospital administrators, on a state and national level was considered a barrier, as was the
possibility that each hospital would individualize multicompetency to fit their needs.

Common to all four cohorts is a fear that the respiratory care profession could lose its professional identity. One educator indicated that the profession has fought so long to gain recognition as an entity which is separate from nursing that we may do more harm if we try to branch into other disciplines.

Amidst all these potential barriers, one educator offered a simple barrier which could nullify all others: the uncertainty that multicompetency is necessary. Although such restructuring as would be necessitated by multicompetency would never be accepted by 100 percent of those professionals it would affect, perhaps the case for multicompetency will need to be strengthened before steps toward its implementation can occur.

Finally worth noting is respondents' concerns that respiratory therapy professionals have a say in multicompetency—its requirements and how they would be implemented. It was expressed that the respiratory care profession needs to increase its membership in professional organizations and become stronger if it expects to have a strong lobby to ensure such input. Compared to other professions, the active memberships roles are considerably smaller. After all, respiratory therapy is not the only profession looking at multicompetency, and if RCPs do not prepare themselves to compete for the remaining fraction of the professional and/or high level procedures through additional training and competence, they could very well be replaced by others who will.
Multicompetency has been practiced for many years in areas of health care where justified. It has already been established in respiratory care in the areas of drawing blood and its analysis, extracorporeal membrane oxygenation and chest physical therapy. But the ultimate question is whether it will ever be practiced on a national basis in all settings, and if so, what barriers will have to be crossed along the way.

Beasley's research demonstrated that graduates from certain allied health programs felt the need to be competent in the performance of tasks outside of their profession. It was also determined that employers would be willing to hire multicompetent practitioners, as RCP's are well suited for cross-utilization by virtue of education and training (Beachey, 1988). My study, however, is on a national level, and in addition to technicians and therapists, I included managers and educators. With barriers identified, considerable costs in manpower can be saved in removing or dealing with these barriers at the outset.

Respondents had 11 barriers to prioritize in the survey (Appendix A) and had an option to list additional barriers they perceived as being significant which were not listed in the survey. It was expected that a core of barriers would surface for each cohort.

In terms of educational barriers, expectations were confirmed in that there are many technicians and therapists who do not want to go back to school, although it is a safe assumption that they are willing to upgrade themselves to some degree. And too, many technicians and therapists were found to be content without increasing their skills. Some indicated they would return to school only if it became an obligation. This is purely
speculation on the researcher's part.

Expectations were confirmed that educators would indicate that universities will not be able to fund baccalaureate programs with only a limited number of students, and that respiratory care managers would predict that hospitals are not willing to pay increased salaries for multicompetent practitioners when they are trying to reduce health care costs. Many other expected cost-related factors, such as costs in restructuring hospital departments, surfaced as well.

Among the findings that this researcher expected and that were confirmed from all four cohorts were: attitudes which reflect a resistance to change, and an expressed difficulty in getting all involved parties to collaborate on how that change might be implemented. Territorial issues between hospital departments also entered this domain. Licensure issues could become complicated, as the years-long trend toward specialization would have to be reversed somewhat toward generalization.

Despite the potential that many barriers were identified in this survey, there is also a positive outcome that was expected and did materialize. That outcome is that an overwhelming majority of respondents feel there is a need for multicompetency and that, in time, the barriers will be conquered.

Limitations and weaknesses of the study mainly revolved around the construction of the survey instrument. Three problems were identified:

1. Some respondents only answered one side of the survey. This may have been eliminated by giving directions at the bottom of the page to turn the page over.
2. Because of the wording, some respondents answered more than once to a few questions which only required one response. This could have been eliminated by making the instructions more explicit.

3. A third and probably most significant weakness of the survey was that the questions pertaining to barriers to multicompetency had too many responses resulting in too few cells with expected frequencies of <5. A significant amount of time and frustration could have been eliminated by consulting a statistician prior to constructing the survey instrument to get feedback as to what data the responses would or would not give.

An interesting result of the analysis of the response rates showed a greater response rate on the surveys from the educators and managers than the therapists and technicians. A possible reason for this disparity in response rate could have been due to the fact that surveys for the technicians and therapists were sent to their home addresses while those sent to managers and educators were mailed to their place of employment. Consideration should be given to the fact that responses may be greater when surveys are filled out on an employers' time versus personal time.

The purpose of this study was to expand the investigation of Will Beasley's study on multicompetency from a local to a national study and also to analyze the attitudes of the four main areas of professional status in respiratory care on the concept of barriers to multicompetency and the prioritization of them. In that context, the study has been successful in that it has identified two areas worthy of future research:

1. Have similar surveys completed on barriers to multicompetency by the other health care professions in which it is felt that skills need to be developed.

2. Identify and analyze specific issues associated with each of the barriers to multicompetency identified in this study.
The specific benefits of future research are hard to calculate; however, it is possible that such research will not only increase our knowledge of the concept of multicompetency and its relationship between the numerous allied health professions but will lay the foundation for a common professional core on which allied health care profession educators, professional organizations and employers can build. If for just this latter reason, additional research is justified and desirable.
References


I. GENERAL INFORMATION

A. Sex:
- Male
- Female

B. Age:
- 20-24
- 25-29
- 30-34
- 35-39
- over 40

C. Check the highest degree earned:
- Registered Certificate
- Associate Degree
- Bachelor’s Degree
- Master’s Degree
- Doctorate Degree

D. Primary Job Responsibility:
- Staff Technician
- Staff Therapist
- Department Manager
- Instructor/Educator
- Other (specify)

E. Highest Credential Achieved:
- CRTT
- RRT

F. Setting of the community in which you work:
- Urban
- Rural

G. In what type of institution are you currently employed?
- Hospital
- Private Home Care Agency
- Rehabilitation Facility
- Educational Institution
- Other (specify)

H. If employed in a hospital, indicate number of beds:
- Less than 100
- 100-249
- 250-499
- 500-900
- More than 900

II. PERCEPTION OF MULTICOMPETENCY NEEDS

A. Do you feel that multicompetancy is a desirable or an advantage to the respiratory care profession at this time, or in the next decade?  Yes No

B. If you did need to become multicompetent in your skills, in which other profession(s) would you feel the need? (More than one choice may be made. Rank in order of importance, 1, 2, 3,...ect.)

PROFESSIONS
- Nursing
- Physical Therapy
- Occupational Therapy
- Radiologic Technology
- Physician Assistant
- Emergency Medical Tech.
- Anesthesia Assistant
- Other (specify)

C. If multicompetency is required in respiratory care, at what level of education do you feel it should exist?
- CRTT
- RRT (Associate Degree in Respiratory Care)
- RRT (B.S. Degree in Respiratory Care)
- All Education Levels in Respiratory Care

D. If it would have been possible when you were a student, would you have enrolled in a baccalaureate degree program leading to multicompetency and/or credential eligibility for more than one profession?
- Yes, if credentialing in two professions would have been possible.
- Yes, if credentialing in one profession, plus gaining skills (no credential) in another would have been possible.
- No
- I don’t know

E. Do you feel more people will enter respiratory care programs if the minimum level of education is increased to achieve multicompetency?
- Yes
- No

F. If increased levels of education are required to achieve multicompetency, how do you feel it should be accomplished?
- On-the-Job Training
- Continuing Education after Graduation
- Tack on Certificate at the Associate Degree Level
- Requirement of Baccalaureate Degree Program in Respiratory Care
III. BARRIERS TO MULTICOMPETENCY

A. Check those items in the following list as to whether you feel it may be barrier to developing multicompetent respiratory care practitioners (RCP).

- Complexity and diversity of restructuring allied health care and getting collaboration of other allied health care profession educators, professional organizations and employers to identify a common professional core and to develop a standard for multicompetency.
- Overcoming traditional lines of distinction or "turf" among other health care disciplines.
- Economic trends in the health care industry.
- Cost effectiveness of multicompetent RCPs.
- Need for multicompetent RCPs in all hospital.
- Job satisfaction and multicompetent RCPs.
- Attitudes toward change in the professional role and training.
- Recruitment for multicompetent RCP training programs.
- Legitimacy of respiratory care in some states which do not have licensure.
- Capacity of all RCPs to become multicompetent and/or handle the rigor of advanced level of higher education.
- Vision of what allied health will become in the next decade.

B. Prioritize all of the following potential barriers to multicompetency. (Start with 1 as being the greatest barrier and 6 as the least.)

- Access to increased levels of education
- Manpower shortage
- Respiratory care practitioner resistance to required increased levels of education
- Increased salaries for increased levels of education
- Territorial issues
- Licensure issues

C. List any other barriers to multicompetency which have not been listed that you feel may be significant.

Thank you for your time and effort spent in completing this survey. Your input is invaluable.
Dear Colleague:

Have you considered what your scope of practice will be in a decade from now? As you may be aware, there has been considerable discussion and articles in the last few years regarding potential changes in the profession of Respiratory Care for the next decade. One of these changes is to become, "multicompetent respiratory care practitioners", which as you may know means to increase our scope of practice to include job responsibilities normally performed by other allied health professions. I am analyzing the potential barriers to becoming a multicompetent respiratory care practitioner and have selected two technicians, therapists, managers and educators from each state to express their views on this issue. I have selected you to represent your state. If you are like most people, you hate filling out surveys, and this is why I have limited mine to one page which can be completed in 3-to-5 minutes.

I value your opinion and what you have to say will hopefully be published, so please take a few minutes to complete the survey and return it to me in the enclosed postage-paid envelope by February 10, 1994.

I appreciate your participation and prompt response.

Sincerely,

Perry K. Bush, BA, RPFT, RRT