

A QUALITATIVE STUDY TO DETERMINE PERCEPTIONS OF NEONATAL AND
PEDIATRIC CLINICAL EDUCATION IN AN ALLIED HEALTH PROFESSION

by

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A dissertation submitted to the Graduate Council of
Texas State University in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
with a Major in Adult, Professional, and Community Education
August 2014

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DEDICATION

I dedicate this dissertation to my family. First and most importantly, I am compelled to recognize my wife Laura Michelle Russian. Laura, I truly cannot express how important your contributions have been to this dissertation. You should be proud of this accomplishment because this dissertation is as much yours as it is mine. You sacrificed so very much to see this project to completion. Your time, suggestions, patience, understanding, reassurance, motivation and most importantly your love provided the strength I needed to “push through”. At times the lows were low but you made the highs higher. You stepped up as a mother, as a wife, as a person to help someone who was struggling dearly. You never asked for anything in return except for another diploma to be placed on my wall and additional letters after my name. Sacrificing so much for someone else is so emotionally overwhelming for me to think about that it is difficult to say, much less type into this dedication. I will forever present this work as our dissertation. Again, this is your dissertation as much as it is mine, so kudos to you. I dedicate this dissertation to you because of all you have done. I love you because of who you are. You mean the world to me.

Second, I must recognize my son Vincent Jude Russian. Vincent, you had an amazing ability to distract me from this project to engage in play and laughter. In hindsight it was exactly what I needed to remain focused on my family. You forever reminded me of my most important responsibility, which is being a father. This

dissertation should serve as proof that even the most daunting of projects can be accomplished with the right motivation (someone as amazing as your mother). Set your goals high and strive for success. You have the support of mom and dad, now and forever. I hope you view higher education with the same passion as I have. It should not define you but completing an advanced degree should be important. When you need a respite from your academics I will be there to distract you with play and laughter. I love you buddy.

I also dedicate this dissertation to my mom and dad. Your unwavering support has been such an amazing example of the love you have for your children. You have offered encouragement to your sons to pursue higher education with steadfast resolve and without regret. You taught us the importance of God, family and education. Your love for your children was second to none. Forever the teachers you educated us, guided us and supported us. You both played a role in the completion of this dissertation. Mom, your edits and encouragement were invaluable. Dad, your comic relief was refreshing and welcomed. Thank you both for being there throughout this journey.

ACKNOWLEDGEMENTS

Acknowledgements are a way to express gratitude for contributions made toward an endeavor. I am not sure I have the ability to express my level of gratitude and appreciation to everyone who contributed to this dissertation. So many people sacrificed time and effort to this project and each of you is deserving of my heartfelt thanks. Below I have included a special thanks to those who played a very significant role in this work. First, I want to thank all the participants who agreed to sit for an interview. Qualitative research projects such as this one rely heavily on participant volunteers to gather the necessary data to answer the research questions. Your time and your perceptions of the clinical experience were invaluable to this project. Second, I want to acknowledge the ENTIRE faculty, whether you directly mentored me or not, in the Education Doctoral Program at Texas State University. You dedicate so much time and effort toward the doctoral students and program. I want you to know that your efforts are recognized and appreciated. Third, I want to thank my dissertation committee members. Dr. Furney, Dr. Ross-Gordon, Dr. Reardon, Dr. Marshall, your copious amounts of suggestions and edits along the way strengthened my methods and organized my writing. Equally, your willingness to sacrifice time to see this project to completion demonstrates your commitment to education and your students. You all played a special role in molding and shaping this dissertation. Your efforts set an example for me that will last a lifetime. Dr. Marshall, your patience with my progress and your support along the way will forever be

remembered. You not only served on my dissertation committee but you serve as a profession mentor. Thank you for everything.

Lastly and most importantly, I want to especially acknowledge Dr. Steven R. Furney, my dissertation chair. Dr. Furney, your willingness to accept me as a doctoral student and to accept my topic of study still creates an enormous knot in my throat. You saved me from a life of wondering if I could ever finish this degree. Multiple times I was resigned to accept the label ABD and fade away with the masses of graduate students. You pushed me when my motivation and confidence were fleeting. You offered encouragement to complete this project. You are a gentleman and a scholar and I will forever be indebted to your efforts and kindness.

To my family and my committee, thank you all for the encouragement to complete this project. I hope this dissertation doesn't disappoint you.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	vi
LIST OF TABLES	xi
LIST OF FIGURES	xii
ABSTRACT	xiii
 CHAPTER	
I. INTRODUCTION	1
Statement of the Problem	1
Purpose of the Study	7
Research Questions	8
Significance of the research	8
Policy	9
Practice	9
Theory Development	10
Research Context	11
Description of Respiratory Care	11
Description of Clinical Education	12
Definition and Explanation of Key Terms	13
Conceptual Framework	17
Theoretical Perspective	19
Constructivism	20
Plan of Inquiry	22
Reflexive Statement	23
Summary	24
II. REVIEW OF THE LITERATURE	26
Clinical Education	27
Perceptions of the Clinical Experience	28
Perceptions of the Clinical Learning Environment	32
Perceptions of Clinical Instructors	39
Situated Learning/Cognition	44

Summary	51
III. METHODOLOGY	53
Description of the Study Site	54
Research Method	56
Profile of the Participants.....	58
Participant Recruitment and Selection.....	61
Data Collection	62
Data Analysis	63
Trustworthiness.....	65
Transferability.....	66
Dependability and Confirmability	67
Triangulation.....	67
Institutional Review Board	68
Philosophical Assumptions	68
Summary	69
IV. FINDINGS OF THE STUDY, DESCRIPTION OF THE PHENOMENON AND BRIEF DISCUSSION	71
Research Questions (Restated)	72
Personal Experiences of the Researcher	72
Student Perceptions.....	74
Structural Description of Student Findings.....	95
Director of Clinical Education Perceptions	95
Structural Description of Director of Clinical Education Findings	100
Clinical Instructor Perceptions.....	101
Structural Description of Clinical Instructor Findings.....	104
Composite Description of the Phenomenon	104
V. CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS FOR FUTURE STUDY	107
Limitations and Delimitations.....	109
Conclusions.....	111
Key Findings Across All Study Participants	131
Implications for Practice	132
Implications for Policy.....	136
Implications for Theory Development.....	140
Revisiting the Theoretical Perspective.....	144
Recommendations for Future Study	153
Final Thoughts	163

APPENDIX SECTION.....	164
REFERENCES	232

LIST OF TABLES

Table	Page
1. CoARC Thresholds for Respiratory Care Education Programs	3
2. Neonatal Intensive Care Unit Level of Care Designation	55
3. Pediatric Intensive Care Unit Level of Care Designation	56
4. Student Participant Demographic Data	60
5. Relevant Points and Additional Information Related to the Patient Interaction Theme	77
6. Relevant Points and Additional Information Related to the Expectations Theme	82
7. Relevant Points and Additional Information Related to the Clinical Instructor Theme	88
8. Relevant Points and Additional Information Related to the Treatment Strategy/Environment Theme	94
9. Common Procedural Competencies for Neonatal and Pediatric Patients	138
10. Clinical Environment Scale (CES) Subscale Descriptions	157

LIST OF FIGURES

Figure	Page
1. Conceptual Model: Three Groups Involved in Clinical Preparation for Respiratory Care Students	18
2. Revised Conceptual Model: Multiple Contributing Factors Toward the Clinical Preparation for Respiratory Care Students.....	143
3. The Abbreviated CLEI-19 Questions.....	158

ABSTRACT

The purpose of this study was to determine the limitations and strengths of neonatal and pediatric critical care clinical education rotations to adequately prepare respiratory care students. All respiratory care programs have a curriculum built around procedural skills assessment in the clinical environment and lecture instruction in the classroom. Therefore, clinical education is an accreditation requirement and is an invaluable part of every respiratory care curriculum. Situated learning was the theoretical perspective and constructivism was the theory of learning that guided my actions, assumptions and perspectives. Using a phenomenological research approach 14 participants were interviewed to gain an understanding of their perceptions of the neonatal and pediatric clinical rotation. An interview guide was used to keep the participants focused on the study's purpose. However, participants were encouraged to speak openly about their clinical experiences. Interviews were recorded and transcribed prior to analysis. The lived experiences of these participants provided the data required to answer the research questions and to generate future areas of research.

Results indicate that participation in respiratory care procedures in the clinical environment is preferred and the ability to engage in direct patient care is a major strength and potentially a limitation of the rotation. The neonatal and pediatric environment offers unique challenges to respiratory care students that could potentially inhibit active involvement with patient care. The clinical instructors play a huge role

toward maximizing student involvement and should be viewed as such by directors of clinical education. Preparatory activities prior to and after the neonatal and pediatric clinical rotation should be strongly considered by respiratory care programs. Student motivation to engage in clinical activities and clinical instructor trust in student abilities appear to play dual roles in neonatal and pediatric clinical outcomes.

These results have definite implications on practice, policy and future theory development. This study provided a beginning source for considering changes in current neonatal and pediatric clinical curriculum. This study will assist directors of clinical education when planning and altering hospital rotations. From a policy consideration the results of this study offer a perspective on neonatal and pediatric clinical rotations that impact accreditation standard development and changes. This study offers a means of comparison of respiratory care students and clinical outcomes to those of other nursing and allied health studies. This study extends the available literature related to perceptions of clinical education. The revision of the conceptual framework will guide researchers efforts in other projects. This study demonstrates the need for research related to clinical education and offers additional recommendations for future studies. Clinical survey development and distribution is the next phase to generate data on clinical education in respiratory care. Comprehensive clinical education offerings are of paramount importance to the success of respiratory care graduates. With additional research we can begin to fill other gaps in the available literature.

CHAPTER I

INTRODUCTION

Statement of the Problem

In 1910, Abraham Flexnor, an educational theorist working for the Carnegie Foundation for the Advancement of Teaching, published his findings following an investigation into medical education in the United States and Canada along with recommendations for the future. Flexnor (1910) believed medical school education should consist of dedicated classroom learning and focused attention on clinical training. His report changed the manner in which medical schools prepared doctors for practice and ushered in a new era of medical education. His recommendations for medical school education are still in place today and also serve as a model for most allied health education programs. A large portion of healthcare education, specifically allied health, occurs outside the traditional classroom and inside the walls of hospitals and clinics. Healthcare education programs rely heavily on these clinical experiences to offer a real-world learning experience and bridge the gap between theory and practice. Learning within this dynamic environment offers an equally rewarding and challenging experience. The respiratory care profession grew from a hospital orderly position during World War II to a full-fledged allied health profession with international reach and a specialized scope of practice. These early “therapists” were primarily responsible for transporting oxygen cylinders to patient areas. Eventually the responsibilities expanded to more complicated tasks and the “oxygen jockey” label was replaced with Inhalation Therapist and then Respiratory Therapist. As the responsibilities expanded so did the need for

formal education. The Allied Health Personnel Training Act of 1966 was a federal law that provided funding for allied health training and most importantly recognition of the allied health professions (Douglas, 2003). The Association of Schools of Allied Health Professions (2012) provides the following definition:

Allied Health professionals are involved with the delivery of health or related services pertaining to the identification, evaluation and prevention of diseases and disorders; dietary and nutrition services; rehabilitation and health systems management, among others. Allied health professionals, to name a few, include dental hygienists, diagnostic medical sonographers, dietitians, medical technologists, occupational therapists, physical therapists, radiographers, respiratory therapists, and speech language pathologists.

Today, all respiratory care (RC) programs maintain a curriculum with a focus on two areas: theoretical knowledge and procedural skills competency. Didactic lectures in the classroom address theoretical knowledge related to respiratory physiology, disease, diagnosis and treatment. Clinical rotations occur in a hospital or clinic with a focus on procedural skills competency, as well as, patient and staff interaction. Clinical rotations impart practical knowledge regarding respiratory care procedures and attempt to blend theory into practice. Assessment occurs in the form of procedural competency evaluations and is difficult to plan due to the dynamic nature of the clinical environment. The Commission on Accreditation for Respiratory Care (CoARC) develops the standards, policies and procedures for respiratory care educational programs in the United States (COARC, 2010a; COARC, 2010b). The outcome assessment thresholds (Table 1.1) for program accreditation are job placement, student attrition/retention, graduate and

employer surveys, and certified respiratory therapist (CRT) examination pass rates (COARC, 2010c). Clinical rotations represent a required component of all educational programs per CoARC standards (2010b); however, there is no threshold governing a program's clinical rotations. CoARC requires respiratory care education programs to provide clinical education experiences to enrolled students "of sufficient quality and duration to enable students to meet program goals and objectives..." (CoARC, 2010b, p. 26). See appendix A.

Table 1. CoARC Thresholds for Respiratory Care Education Programs.

PROGRAM OUTCOME	CUT SCORE/DEFINITION AS OF JULY 1 ST , 2012	THRESHOLD AS OF JULY 1 ST , 2012
CRT Credentialing Success	NBRC passing score (set by NBRC) On the RCS this calculation excludes graduates who have previously earned the CRT credential prior to matriculation into the program (i.e., advanced placement). This calculation includes baccalaureate and graduate students earning the CRT credential in CoARC-accredited programs approved to grant special certificates of completion for CRT/RRT eligibility under CoARC policy 13.0.	80% of total number of graduates obtaining NBRC CRT credential (3-year average)
RRT Credentialing Success	N/A (programs are still required to provide RRT outcomes data on annual reports, however, no accreditation actions will be taken based on RRT credentialing success).	N/A

Table 1-Continued. CoARC Thresholds for Respiratory Care Education Programs.

RPSGT/SDS Credentialing Success	N/A (programs are still required to provide RPSGT and/or SDS outcomes data on annual reports, however, no accreditation actions will be taken based on RPSGT or SDS credentialing success).	N/A
Retention/Attrition	<p>Students formally enrolled in a respiratory care program that began fundamental (non-survey) respiratory care core coursework and have left for academic or non-academic reasons. Students who leave the program before the fifth calendar day from the beginning of the term with fundamental respiratory care coursework and those students transferring to satellites are not included in program attrition.</p> <p>Academic – Attrition due to failure to meet grades or other programmatic competencies (e.g. ethics, professionalism, behavioral) or another violation of an academic policy that results in a student’s expulsion from the program.</p> <p>Non-academic – Attrition due to financial hardship, medical, family, deployment, changing course of study, relocation, or reasons other than those defined in Academic.</p> <p>Fundamental respiratory care coursework is defined as: Professional coursework progressing toward the completion of the respiratory care program once formally admitted into the program.</p>	40% attrition of the total number of students in the enrollment cohort (3-year average)

Table 1-Continued. CoARC Thresholds for Respiratory Care Education Programs.		
Positive (Job) Placement	<p>Defined as a graduate within the three year reporting period who is:</p> <ul style="list-style-type: none"> a. employed utilizing skills as defined by the scope of practice within the respiratory care profession (i.e. full- or part-time, or per diem), or b. enrolled full- or part-time in another degree program, or c. serving in the military. d. 	70% positive placement (3-year average)
Graduate Survey – Overall Satisfaction	<p>A rating of 3 or higher on a 5-point Likert scale for overall satisfaction. The calculation is as follows:</p> $\frac{\# \text{ surveys with scores greater than 3}}{\# \text{ surveys returned} - \# \text{ surveys omitted}}$	At least 80% of returned graduate surveys rating overall satisfaction 3 or higher on a 5-point Likert scale.
Graduate Survey – Participation	The total number of program graduates employed in respiratory care who return their graduate survey.	50% of the graduates have returned surveys (3-year average)
On-Time Graduation Rate	<p>Beginning with the Annual Report that was due July 1, 2011 all programs were required to report their on-time graduation rate. On-Time Graduation rate is defined as the Total Number of On-Time Graduates divided by the Total Number of Graduates. This is calculated as the number of students who graduate with their enrollment cohort (i.e. within thirty (30) days of their expected graduation date) divided by the total number of students who graduated on-time and students who graduated after the expected graduation date. The enrollment date and the expected graduation date of each cohort are specified by the program.</p>	<p>70% On-Time Graduate Rate</p> <p>This is effective with the submission of the 2015 Annual Report of Current Status.</p>

Table 1-Continued. CoARC Thresholds for Respiratory Care Education Programs.		
Employer Survey – Overall Satisfaction	<p>A rating of 3 or higher on a 5-point Likert scale for overall satisfaction.</p> <p>The calculation is as follows: $\frac{\# \text{ surveys with scores greater than 3}}{\# \text{ surveys returned} - \# \text{ surveys omitted}}$ </p>	At least 80% of returned graduate surveys rating overall satisfaction 3 or higher on a 5-point Likert scale.
Employer Survey – Participation	The total number of employers of program graduates who return their employer survey.	50% of the employers have returned surveys (3-year average)

A 2011 publication questioned the neonatal and pediatric clinical preparation of respiratory care students. Walsh, Gentile and Grenier surveyed members of two specialty sections, i.e. Manager’s Section and Educator’s Section, within the American Association for Respiratory Care (AARC) to gain insight into neonatal and pediatric critical care preparation. The authors collected quantitative data focusing on three specific areas; adequacy of preparation of respiratory therapists (RTs) entering the neonatal and pediatric environment, length of orientation, and the methods used to train new neonatal and pediatric RTs. Surveys were distributed to 3,087 specialty section members and generated a response rate of 8%. Despite the low response rate, Walsh, et al. reported interesting results and presented a discussion that has strong implications for the clinical portion of respiratory care programs.

In the study, hospital managers expressed concerns about the preparation of students and new graduates entering their facilities (Walsh et al., 2011). Equally, Respiratory Care educators expressed concerns of students not receiving adequate

preparation in the critical care environments, given the current expectations of clinical practice (Walsh et al., 2011).

Our results suggest the managers and educators surveyed perceived a substantial lack of preparation in new RTs [sic] for neonatal/pediatric care...A lack of adequate preparation for clinical practice might, at least partially, explain the long orientation period the respondents deemed necessary to prepare neonatal/pediatric RTs. (Walsh et al., 2011, p. 1127)

The problem identified in this research study is according to Walsh et al. (2011) new respiratory care graduates are underprepared for the neonatal and pediatric critical care environment due to inadequate clinical preparation while completing the degree requirements. Walsh et al. did not provide research demonstrating specific limitations and strengths of neonatal and pediatric clinical rotations in preparing respiratory care students; therefore, a gap exists in the evidence linked to this area of clinical practice. As a result, RC program personnel have incomplete information on the specific elements of neonatal and pediatric clinical rotations needed to properly prepare students to function effectively in that specific patient environment.

Purpose of the Study

The purpose of this study is to determine the limitations and strengths of neonatal and pediatric critical care clinical rotations to adequately prepare RC students. Research focusing on the strengths and limitations of neonatal and pediatric clinical rotations for RC students will allow program personnel to potentially readdress the findings identified by Walsh et al. (2011). Potentially, this study will expand on the findings by Walsh et al.

(2011) and identify issues within neonatal and pediatric rotations needing additional attention. To this end, this study will address the problem stated above with a research focus on three populations, 1) respiratory care students 2) respiratory care directors of clinical education, and 3) clinical instructors for neonatal and pediatric critical care rotations. Through this project, it is my intention to contribute knowledge related to an identified pedagogical problem within the world of respiratory care clinical education.

Research Questions

This study will address the following major research questions:

1. What limitations and strengths do respiratory care students believe exist for the neonatal and pediatric critical care clinical rotation?
2. What limitations and strengths do directors of clinical education believe exist for the neonatal and pediatric critical care clinical rotation?
3. What limitations and strengths do clinical instructors believe exist for the neonatal and pediatric critical care clinical rotation?

Significance of the Research

This study will provide information on the strengths and limitations of neonatal and pediatric clinical rotations, thus addressing a finding reported by Walsh et al. (2011). The significance of this study will be described from a policy, practice, and theory perspective.

Policy

This study can inform the national accreditation body for RC education—CoARC—of the strengths and limitations of neonatal and pediatric critical care clinical rotations. CoARC regulates standards for clinical requirements for all respiratory care programs across the nation. Currently, there are no specific clinical requirements for the neonatal and pediatric clinical rotations, e.g. minimum number of clinical days, minimum number of skills to assess, etc. This study can provide CoARC with information on neonatal and pediatric clinical rotations to determine whether policy adjustments are necessary.

Practice

This study can offer respiratory care program personnel a basis for considering changes in current neonatal and pediatric clinical curriculum requirements. Student and clinical instructor perceptions can inform directors of clinical education of perceived strengths and limitations regarding neonatal and pediatric clinical rotations. This information may assist directors of clinical programs to make transformative changes during rotation planning and clinical instructor assignment. In addition, this study can inform directors of clinical education of critical elements either missing or present when assessing clinical rotations and assist other studies with a focus on clinical rotations. It can inform directors of clinical education and clinical instructors if specific pre-rotation, mid-rotation, or post-rotation teaching material and training is required for the neonatal and pediatric clinical rotations. In addition, it can inform directors of clinical education if

clinical instructors need additional clinical or didactic material to improve their teaching abilities. This information could guide efforts toward the development of a clinical education handbook and curriculum to be used by respiratory care programs across the country.

Walsh et al. (2011) demonstrated that knowledge gaps exist when new respiratory care graduates enter the neonatal and pediatric critical care environment. Identification of the strengths and limitations of neonatal and pediatric clinical rotations can allow directors of clinical programs and instructors to adjust curriculum delivery and potentially close the knowledge gaps. If these gaps can be addressed prior to graduation, the healthcare facility will receive a practitioner with a greater level of skill and expertise. As a result, clinical facilities will benefit as they welcome a more clinically capable respiratory care student, respiratory care graduate, and, ideally, generate better patient care.

Theory Development

Published literature on the perceptions held by respiratory care students, respiratory care directors of clinical education, or respiratory care clinical instructors toward the limitations and strengths of neonatal and pediatric respiratory care clinical rotations was not located during the literature search. This study will ascertain the perceptions of three specific populations intimately involved in critical care clinical education within an allied health profession. The information obtained from this project will allow for comparison to similar research that has been conducted by other healthcare professionals, i.e. nursing, pharmacy and medical school/residency training. It will extend

the current research related to perceptions of clinical education by adding new knowledge as it relates to the respiratory care profession. This study will examine the perceptions held by respiratory care students, directors of clinical education, and respiratory care clinical instructors thus offering future researchers a starting point for theory development.

Research Context

In the following section, I provide a description of the respiratory care profession and the clinical requirements of respiratory care programs. I also provide key terms as they relate to the available literature and this project.

Description of Respiratory Care

The Respiratory Care field is a relatively young profession. The roots of the profession began in the mid-1940s with a group of hospital employees known as “oxygen tank technicians” who performed specific patient care procedures without the requirement for formal education (Ward and Helmholtz, 1997). The original respiratory therapists gained support through several physician groups to begin educational lectures on specific topics related to inhalational therapy. Today, over 400 respiratory care schools provide classroom education and clinical training to nearly 7,000 students per year (personal communication Lisa Collard, CoARC, 2010). Most respiratory care programs operate with an integrated didactic and clinical component, i.e. students participate in classroom lectures and clinical rotations, concurrently. During clinical rotations, the majority of respiratory care programs adhere to a small group format, e.g.

on the average of four students per preceptor (Rye and Boone, 2009). CoARC provides accreditation standards for respiratory care programs and clinical rotations requiring a maximum preceptor-to-student ratio of 1:6.

Respiratory Therapists evaluate and treat patients with breathing problems, such as asthma, chronic obstructive pulmonary disease and cystic fibrosis. Our scope of practice involves caring for patients throughout their entire lifetime, from infants born prematurely to geriatric patients at the end-of-life. We receive training and education in pulmonary diagnosis, treatment, and rehabilitation. Respiratory care coursework incorporates a substantial degree of cardiac, as well as, pulmonary medicine training. Equally, cardiac and pulmonary topics are tested on national board exams for respiratory care students. Because of the close association between the cardiac system and the pulmonary system, it is not uncommon for hospitals and academic programs to use *Cardiopulmonary Services* for the title of the department managing and educating respiratory care students. The cardiopulmonary training and expectations for respiratory therapists speaks to the importance of sound didactic and clinical education.

Description of Clinical Education

Respiratory care programs integrate a large number of clinical hours into the curriculum. There are no specific requirements for clinical education clock hours; therefore, programs across the United States require a variety of clinical hours. In general, students rotate through the following clinical areas: adult general floors, adult intensive care, neonatal intensive care, pediatric intensive care, pulmonary function testing and diagnostics, and pulmonary rehabilitation. Clinical rotations consist of a small

group of students rotating within a clinical site for one to two days per week. Generally, there is one clinical instructor assigned to each group of students. During clinical rotations students will assess, treat, and/or rehabilitate patients with pulmonary disorders; however, multiple secondary diagnoses may also be present. It is essential that students possess knowledge of numerous medical conditions and procedures beyond cardiopulmonary disorders. Therefore, students are taught diagnostic and therapeutic procedures for which they must demonstrate a specific knowledge of multiple pieces of equipment, and must have a solid understanding of pulmonary and cardiac pharmacology. The information presented above is a testament to the level of education provided to respiratory care students and to the expertise each clinical instructor must possess. In the clinical setting, clinical instructors become the primary faculty member and must teach students clinical skills, and some theoretic topics, within a dynamic and challenging healthcare environment. Although students have received theoretical knowledge pertaining to a variety of medical procedures and conditions they may not have practiced those skills on actual patients in the clinical setting. Therefore, clinical instructors should possess sound clinical skills to guide the students during the clinical experience. In addition, clinical instructors must be intimately involved with the program curriculum, the students' matriculation in the program, the procedural needs of the students and the procedural expectations for the clinical course.

Definition and Explanation of Key Terms

- Certified Respiratory Therapist (CRT) examination and credential: the entry-level examination for respiratory care students once they complete CoARC

requirements, e.g. minimum of an associate's degree in Respiratory Care.

The CRT credential signifies the therapist has successfully passed the entry-level examination.

- Clerkship: the practice of medicine by medical students during the third and/or fourth year of school.
- Clinical Rotations: the educational experiences implemented by the director of clinical education to include hospitals, clinics and laboratory exercises.
- Clinical Site: a hospital, healthcare clinic, or physician's office that allows students to enter and participate in clinical education requirements.
- Clinical Instructor: a person hired by the respiratory care program to instruct students in the clinical setting. Clinical instructors are not employed by the hospital during the time period they are educating students. A clinical instructor provides instruction related to procedural competencies to one or more students for a specified time period. Clinical instructors have complete dedication to the respiratory care students during clinical rotations. AKA: clinical faculty.
- Commission on Accreditation for Respiratory Care (CoARC): the national accreditation organization charged with accrediting respiratory care programs in the United States.
- Director of Clinical Education (DCE): a person responsible for the organization, administration, review, planning, and development of clinical experiences for students enrolled in a respiratory care program.

- Graduate respiratory therapist: a person who has completed an accredited respiratory care program, per CoARC standards, but has not passed the registered respiratory therapist (RRT) examinations (Barnes et al., 2010).
- Hospital Educator: a respiratory therapist identified by the respiratory care hospital department to serve as educator for departmental staff. This person may also participate in educational activities with respiratory care clinical students.
- Mentor: A mentor is not assigned to someone but rather chosen. “There is a focus on fostering the mentee’s individual growth and development over an extended period of time. Mentors develop a professionally based, nurturing relationship, which generally occurs during personal time” (Garneau, 2014, p. 49). The attention on specific procedural assessment is not a major focus but instead there is an interest in the personal growth of the mentee (Yonge et al, 2007; Dancer, 2003).
- National Board for Respiratory Care (NBRC): a voluntary health certifying board to evaluate the professional competence of respiratory therapists. Through its subsidiary, Applied Measurement Professionals, Inc. (AMP) the NBRC oversees the development, administration, and measurement of all respiratory care board exams.
- Preceptor: a faculty or practitioner who serves as clinical educator and oversees students (Marrs and Rackham, 2010). A preceptor provides clinical instruction related to procedural competencies to one or more students for a specified time period. The separation between teacher and student is more

evident with the preceptor role as compared to a mentor. Other roles bestowed upon clinical preceptors include, guiding student progress, evaluation of clinical competence, and facilitation of confidence (Myrick and Barrett, 1994).

- Preceptee: the person receiving instruction and guidance from a preceptor or program faculty. AKA clinical student
- Program Faculty: a person holding a faculty appointment within the respiratory care program with responsibilities toward clinical and classroom teaching.
- Registered Respiratory Therapist (RRT) examination and credential: the advanced-level examination for respiratory therapists. The RRT examination consists of a written portion and a simulation portion. Using the RRT credential signifies successful completion of both portions of the examination. A respiratory therapist must possess a current CRT credential to be eligible for the RRT examination.
- Respiratory Care Practitioner (RCP): a person licensed to practice respiratory care. See also respiratory therapist.
- Respiratory Therapist (RT): a person participating in the evaluation, treatment, and care of patients with breathing or other cardiopulmonary disorders. See also respiratory care practitioner.

Conceptual Framework

This project will assess the limitations and strengths of neonatal and pediatric critical care clinical rotations from the perspective of respiratory care students, the respiratory care directors of clinical education, and respiratory care clinical instructors. The three groups targeted in this project represent important components for respiratory care clinical rotations. Figure 1 offers a visual model of the conceptual framework at the beginning of this study. Clinical preparation for respiratory care students is dependent on the clinical instructors, the directors of clinical education, and the students. Information will be generated from the perspectives of each group of participants. It was anticipated that the conceptual framework below would change at the conclusion of the study. Once the data was gathered and themes began to emerge there appeared to be other factors involved that impacted clinical rotations and learning for respiratory care students.

Remember that a concept map is not an end in itself; it is a tool for developing theory and making that theory more explicit. Also, keep in mind that a concept map is not something that you do once and are finished with; you should go back and rework your concept maps as your understanding of the phenomena you are studying develops. (Maxwell, 2013, p. 64)

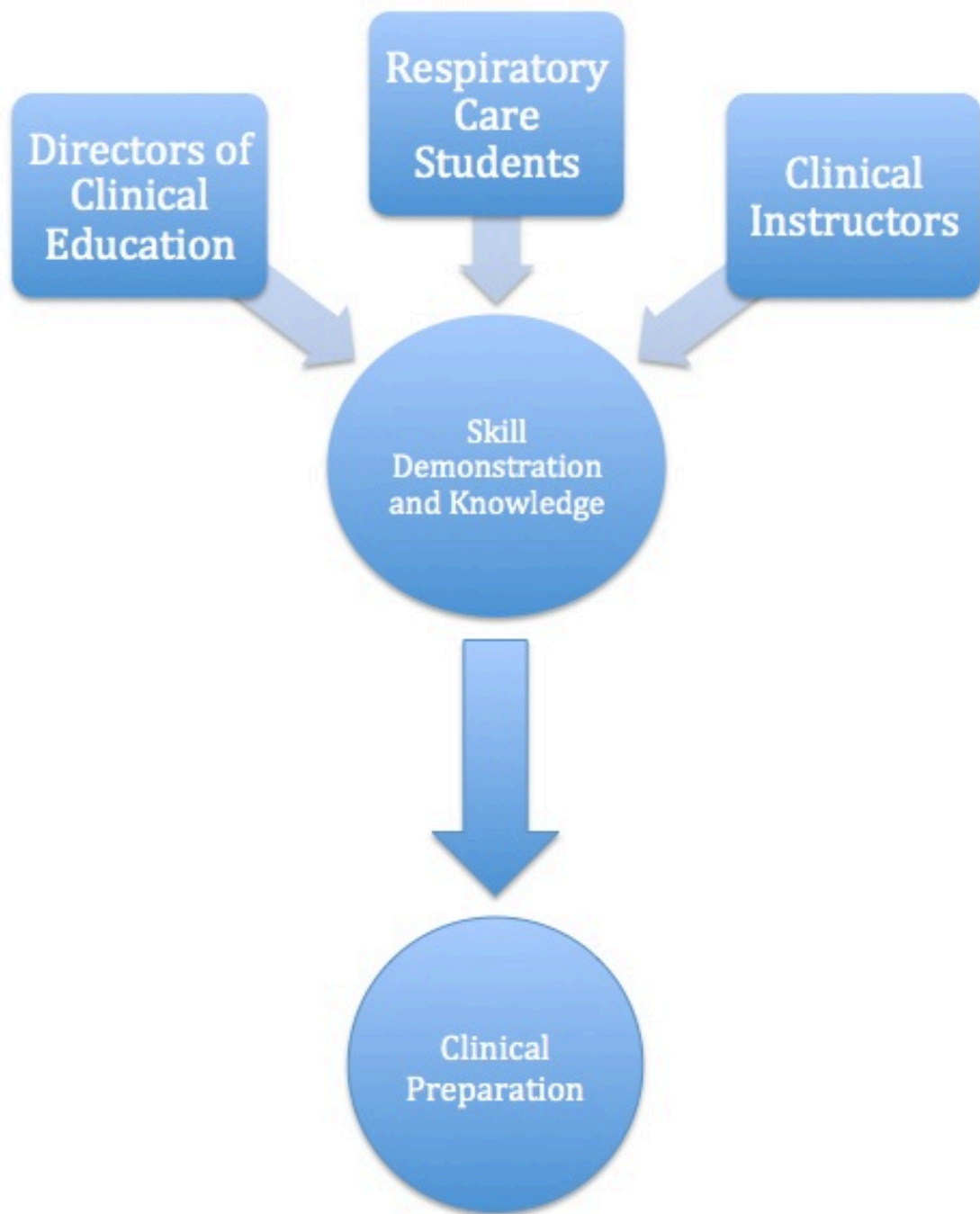


Figure 1. Conceptual Model:

Three Groups Involved in Clinical Preparation for Respiratory Care Students

Theoretical Perspective

My theoretical perspective is based on situated learning. Situated learning is the belief that learning is directly related to the situation in which it occurs (Lave and Wenger, 1991). There is an attempt to merge the typically separate decontextualized learning, e.g. classroom instruction of theoretical information, and learning in context with social interaction. Closely related to situated learning is the theory developed by Brown, Collins, and Duguid (1989) known as situated cognition, described as the environment in which learning and knowledge is applied and the enormous role the environment plays in how knowledge and learning are formulated and developed. Situated cognition conveys the importance of blending the abstract with the activity and the context. Learning in context, i.e. the real world, allows attention to be directed toward problems that are authentic and applicable to the participant's situation and understanding. "Situations might be said to co-produce knowledge through activity" (Brown et al., 1989, p. 32). The learner becomes more engaged and motivated to solve problems that were created in this environment, thus increasing the likelihood of transfer of training from theory to practice.

Learning from abstract concepts without situational contexts "...overlooks the way understanding is developed" (Brown et al., 1989, p. 33). This separation of abstract concepts and situation prevents the continuous involvement and growth of the individual or student that should occur when learning new information. Our understanding of a singular concept or piece of information will never change without the addition of different perspectives. These perspectives arrive in the form of our social interactions within the environment. Brown et al. relate these concepts using the analogy of a set of

tools as being the conceptual, abstract knowledge we may receive. To truly understand the usefulness of the tool it has to be used. Through repeated use and with guidance from an expert, the proper function of the tool is understood. The user will undoubtedly change their concept of the tool and their knowledge following a situational experience. The user will also begin to appreciate the full range of the tool, meaning how it is used based on the instructions from the manufacturer and how it can be used in other ways. For example, the hammer is not only used to drive nails and remove nails, but it can be used to apply leverage. Although there is a specific purpose for each tool, the functionality of any one piece cannot be achieved without the situational experience.

Clinical education is a ubiquitous and valuable form of teaching and learning within the medical professions. Regardless of the discipline, learning takes place in a real-life environment in which students are actively participating in the process. Clinical education allows the integration of a number of related skills into the care of each patient. Clinical instructors model acceptable behaviors, attitudes, and professional practice. The environment is unpredictable and dynamic and students may experience “unexpected” learning on any given day. Therefore, it is important for students to engage in practice, reflect on that practice, and generate new knowledge from old knowledge. It is this theoretical perspective of situated learning that makes clinical education so valuable.

Constructivism

Constructivism is a common theory of learning supported in medical education around the United States (Mann, 2011; Colliver, 2002). By nature and/or nurture, I am closely aligned with the constructivist theory of learning. Liu and Matthews (2005)

describe constructivism in the following way, "...knowledge is not mechanically acquired, but actively constructed within the constraints and offerings of the learning environment..." (p. 387). New knowledge is discovered and processed by the learner through various interactions; it is referenced against current knowledge then stored in the learner's memory (Bodner, 1986). The learner uses past knowledge and experience to assist in comprehending new knowledge or experience. "Students are active participants in the learning process, rather than passive recipients of knowledge that has been accumulated by others and transmitted to them" (Splitter, 2009, p. 139). Bodner (1986) describes the construction of new knowledge as occurring through assimilation and accommodation. Assimilation refers to the process of aligning new knowledge with past knowledge. By aligning the new experience with the internal representation of a similar occurrence, the learner can achieve his or her own version of the experience. Accommodation refers to the modification of one's past knowledge to mesh with the new knowledge. Once this new knowledge has been assimilated with past knowledge, a new framework for the experience is created.

Along similar lines of thinking is the perspective of situated cognition or learning. Constructivism and situated learning both stress the importance of meaningful learning environments. Lave et al. (1991) emphasize the importance of social settings to learning. Learning is situated in certain circumstances and our interaction with other individuals in that community. Learning is grounded in everyday situations and is not separate from the world of action (Pitri, 2004). Understanding, from a constructivist point of view, is a function of the context and the activity of the learner within her or his environment. Situated learning and constructivism have a strong influence within this project.

Consistent with the ideas of constructivism, I believe in the benefits of reflection on our experiences to aid in knowledge development. Through reflection the learner can construct new rules and a new framework. This framework will support actions and build upon continued learning. This theory places little emphasis on standardized tests and grades and more emphasis on self-evaluation. Through self-reflection the learner is expected to construct a better understanding of the experience.

Plan of Inquiry

Through qualitative inquiry using a phenomenological research approach, this study investigated the perceptions held by students, directors of clinical education, and clinical instructors toward the neonatal and pediatric critical care clinical education. Giorgi (2012) describes phenomenology as being, “interested in the activities of consciousness and the objects that present themselves to consciousness” (p. 9). There is an interest in the phenomenon as experienced by a person or group of people (Creswell, 2013). “Phenomenon within phenomenology always means that whatever is given, or present itself, is understood precisely as it presents itself to the consciousness of the person entertaining the awareness” (Giorgi, 1997, p. 238). Therefore, phenomenology fit the research problem for this study because there was a desire “to understand several individuals’ common or shared experiences of a phenomenon” (Creswell, 2013, p. 81).

The aim is to determine what an experience means for the persons who have had the experience and are able to provide a comprehensive description of it. From the individual descriptions general or universal meanings are derived, in other words the essences or structures of the experience. (Moustakas, 1994, p.13)

The phenomenological method provided guidance to explore the experiences of individuals directly involved in and impacted by the neonatal and pediatric clinical education program. There are several ways to conduct research using a phenomenological method. Giorgi (1997) discusses three interlocking steps encompassing phenomenology methodology, e.g. 1) reduction, 2) description and 3) essence. Reduction attempts to make the research inquiry more precise by bracketing past knowledge and forcing the researcher “to consider what is given precisely as it is given, as presence, or phenomenon” (Giorgi, 1997, p. 240). Description requires the “articulation of the given as given” by including an intrinsic account of the phenomenon (Giorgi, 1997, p. 241). Lastly, essence is the articulation of the fundamental meaning of the phenomenon for the scholarly community (Giorgi, 1997). I specifically followed a modified version of the Stevick-Colaizzi-Keen method to bracket personal views, to search for descriptive statements, and to generate the essence of the experience for the participants. I used semi-structured individual interviews, incorporating prompting to guide discussion, to collect the experiences from the participants. Prompt statements focused on the participant’s perceptions of the neonatal and pediatric clinical rotation. The exact procedures used to study the phenomenon are discussed in greater detail in chapters three and four. As stated above, a phenomenological approach guided my actions because it allowed me to investigate the experiences of the participants.

Reflexive Statement

As a respiratory therapist and the Director of Clinical Education within the Department of Respiratory Care, I plan to bring my personal insights and experiences

into this project. Although I used strategies aimed at minimizing the influence of my perceived biases on the research process, I do have perspectives on clinical education—from my academic and administrative experience—that will contribute to this study. I believe the changes occurring in hospitals will also change the way in which we educate our students within those walls. I believe recent developments in proprietary respiratory care education will most certainly impact how we educate our students within the hospital. And lastly, I think the changes planned for the College of Health Professions, the Department of Respiratory Care—where I am a faculty member—and the Texas State University Round Rock Higher Education Campus will impact how we educate our students both in the classroom and the clinical environment. When considering all of these forces, I believe this project offered valuable information to help improve the neonatal and pediatric clinical portion of respiratory care programs. I have a strong commitment and dedication toward the clinical education program and for our students. Conducting this research affirmed some aspects of our clinical education program and informed me of needed changes in the way we conduct our clinical rotations. I hope the findings and discussion presented below will spur debate and have an impact on the field.

Summary

Respiratory therapists are heavily involved in the health care landscape and the profession is recognized as an Allied Health Profession. Therapists are considered specialists in cardiopulmonary care due to their training in the diagnosis, treatment and rehabilitation of patients with cardiopulmonary disorders. In addition to rigorous didactic education, Respiratory Care programs rely heavily on the clinical environment to educate

future therapists. Clinical education provides the authentic learning experience that is so important to constructing new knowledge and understandings. A recent study questioned the preparatory training respiratory care students are receiving specifically in the neonatal and pediatric areas (Walsh, Gentile and Grenier, 2011). Prior to beginning this study it was believed that the experiences of individuals directly involved in the neonatal and pediatric clinical rotation could provide information that would address the gap created by Walsh et al. Through a phenomenological research design this study investigated the perceptions held by three groups directly involved in neonatal and pediatric clinical preparation. It is anticipated that the findings of this study will refute or corroborate the findings from that recent report and add new literature to current understanding of respiratory care clinical preparation.

CHAPTER II

REVIEW OF THE LITERATURE

The focus of this study is on respiratory care students, clinical instructors and directors of clinical education. When completing a search of three scholarly databases—PubMed, CINAHL, and Wilson Web—no articles, books, or manuscripts related to this topic were found. In an attempt to increase the number of “hits,” respiratory care was removed as a search qualifier and the search focused on students, clinical instructors and directors of clinical education perceptions. The vast majority of literature gleaned from this expanded search related to the nursing profession. Since the respiratory care profession and the nursing profession are both practice-based professions and work side-by-side in the healthcare environment, it is foreseeable that the outcomes of nursing research on the clinical environment could lend valuable information to respiratory care educators. The retrieved literature was read and grouped in the following categories: clinical education, perceptions of the clinical experience, perceptions of the clinical learning environment and perceptions of clinical instructors. Although the primary focus is on student perceptions, some of the literature below will provide perceptions from experienced practitioners when it supports the focus of the study. I did not locate any literature specifically related to directors of clinical education perceptions. The last part of this literature review section relates to situated learning/cognition.

Clinical Education

In 2008, the American Association for Respiratory Care (AARC) sponsored a task force to determine the future of the respiratory care profession including the educational requirements to practice respiratory therapy. The 2015 and Beyond project brought together stakeholders representing employers, insurers, professional organizations, foundations, state and federal government agencies, patients and consumers, the education community, accrediting and credentialing agencies, and state licensure boards. The 2015 conferences have assumed the difficult task of identifying changes needed prospectively to enable the current education system to produce RTs with the skills, knowledge, and competencies necessary to provide optimal care in 2015 and beyond. (Barnes, Gale, Kacmarek and Kageler, 2010, p. 602)

The attendees of the three conferences identified 69 procedural competencies the graduate respiratory therapist must possess upon entry into the workforce (Barnes et al., 2010). It was repeatedly stressed that graduates of respiratory care programs need to begin practice in the healthcare environment with excellent critical thinking skills and immediately contribute to the workforce (Barnes et al., 2010). Current graduates of respiratory care programs are required to possess a greater amount of knowledge in order to function effectively within the current healthcare team environment compared to past graduates. For example, there is an immediate need to apply evidenced-based protocols in acute, chronic and critical care settings, to participate in rapid response cardiac and respiratory failure code teams, and to participate in wellness and disease prevention programs for patients with chronic illness (Barnes et al., 2010; Kacmarek, Durbin, Barnes, Kageler, Walton, O'Neil, 2009). Clinical rotations offer the opportunity for

students to acquire the knowledge and skills needed to practice in the changing healthcare environment. If clinical rotations are not providing the psychomotor component of the clinical experience, then students will likely enter the workforce without the practical knowledge required by the current healthcare system. In effect, students may possess a large amount of theoretical knowledge, yet lack the practical experience to function effectively in the critical care environment. Ultimately, the hospital will be required to provide this level of clinical education. As pointed out by Abraham Flexnor, medical education belongs in an accredited educational establishment. Accreditation of hospital education does not exist; therefore, there is no guarantee that the respiratory care graduate will receive a quality learning experience that transcends across multiple facilities and locales. The graduate may learn how to perform procedures as they relate to a particular hospital, but it is unlikely that a merging of theory and practice will occur consistently. Are respiratory care educational programs preparing the new graduate for current clinical practice?

Perceptions of the Clinical Experience

The clinical environment allows healthcare students the opportunity to expand skill acquisition and match theoretical knowledge with real-world experience while delivering care to actual patients. It also fosters the connection with professional staff by assisting the student in developing and establishing professional and ethical standards (Chapman and Orb, 2000). Roles, responsibilities, and time management skills are learned in a manner not found during traditional classroom lectures (Windsor, 1987). Although educators recognize the value of clinical education, the student perceptions of

the experience seem paramount to the discussion of clinical education. Positive and negative perceptions of the experience can certainly impact learning. Following a search and review of the literature related to perceptions of the clinic experience, some of the major themes are discussed below.

Although rewarding, clinical education can be somewhat formidable. Numerous factors related to the clinical experience impact healthcare students in both positive and negative ways. The hospital environment (e.g. acute care versus chronic care), the patient population (e.g. socioeconomic status, gender, and age), and the clinical instructor represent a few elements thrust upon the student that may greatly influence the experience. Thus, the initial student exposure to the clinical site can be somewhat daunting and certainly affect the perceptions of the experience. The intimidation upon entering a new clinical site and the anxiety of performing medical procedures on actual patients may overwhelm inexperienced students (Pagana, 1988). Program faculty attempt to alleviate anxiety through the use of pre-clinical activities; however, actual patient care within the clinical site produces realistic scenarios with a variety of outcomes. It is clear from the available literature that healthcare students certainly experience stress and anxiety upon initially entering the clinical arena (Sharif and Masoumi, 2005; Reider and Riley-Giomariso, 1993). Reider & Riley-Giomariso (1993) stated, "...faculty should be cognizant of anxiety felt by students and the sources of the anxiety so that appropriate support can be provided" (p. 131). The anxiety will also carry over into procedural check-offs and when communicating with patients (Sharif and Masoumi, 2005). Patterson and Morin (2002) demonstrated that gender specific stress also occurs when assigning students into various clinical rotations. Male nursing students assigned to a maternal-

child rotation felt awkward performing post-partum assessments. Although participating in post-partum exams is not a practice skill for the respiratory care profession, there are situations that require intimate exposure of the patient for diagnostic purposes, e.g. femoral arterial blood sampling or electrocardiographic lead placement. Furthermore, the stress and anxiety of the clinic setting is not unique to the nursing profession. Sarikaya, Civaner, and Kalaca (2006) reported on the stress felt by medical students upon entering the clinical environment; however, stress was decreased among students receiving a pre-clinical course. The study by Sarikaya et al. reinforces the need for program faculty to appropriately plan clinical and pre-clinical rotations and to communicate with students in potential stress-causing situations. Students appear to be motivated to learn in the clinical environment when proper support is available (Dornan, Hadfield, Brown, Boshuizen, and Scherpbier, 2005). Dornan et al. (2005) utilized qualitative methodology to inquire about medical student learning within the clinical environment. The findings indicated students preferred an environment that offers supportive instructors and friendly staff.

In addition, program faculty should routinely assess student perceptions following the clinical experience to expose any issues and recognize the need for adjustments. Sarikaya et al. (2006) demonstrated that medical students have anxiety about making the wrong diagnosis and performing the wrong treatment during emergency situations. The literature, albeit limited, on the nursing and physician professions demonstrates that these two healthcare providers experience unique anxiety related to clinic. One could surmise that other healthcare providers, i.e. respiratory care students, would also experience anxiety upon entering the clinical environment. However, direct comparisons cannot be made because the literature does not exist on the respiratory care profession.

Related to the stress and anxiety of the clinical environment is the reality shock of the role. It is not uncommon for nursing students to feel overwhelmed upon entry into the clinic by the responsibilities associated with professional practice (Cooper, Taft, & Thelan, 2005). The hospital environment can appear somewhat exciting when sitting in a classroom; however, the realization that a human life is dependent on the actions of the healthcare providers can weigh heavily and create negative feelings in some students (Cooper et al., 2005). Similar struggles between idealistic practice and reality were discovered by Beck (1991) and Shin (2000) when exploring nursing students' perceptions of the clinic experience. Nursing students reported being disappointed with the role they discovered once entering the hospital (Shin, 2000). Beck (1991) reported, "Students may choose nursing as a way of helping people but often they are not prepared to deal with the complexities of the world of nursing" (p. 132). It is not uncommon for students to develop a negative view of the clinical experience based on unrealistic expectations (Hickey, 2010). Obviously, the ideal scenario is for each clinical rotation to build upon the previous rotation. Exposure to a variety of psychomotor skills during each rotation can offer the necessary challenge and excitement to a greater number of students. Therefore, a sense of apathy can develop when asked to perform tasks students may consider "mundane and menial" that have been performed numerous times (Hickey, 2010). Of course, not all experiences and expectations lead to negative perceptions. Many students thrive on the experiences offered by the clinical environment and relish the opportunity for direct patient contact (Cooper, Taft, & Thelan, 2005).

Lastly, the reality that the required tasks of a healthcare provider in the clinical environment typically differ from the tasks covered in the classroom can have a negative

impact. It is not uncommon for students to consider some clinical tasks beneath their level of practice or expertise (Hickey, 2010). In the classroom, educators obviously encourage thinking, whereas, in the clinical environment the focus is on doing (Chan, 2002b). The important question is, are student expectations for clinical rotations consistent with course expectations, goals, and objectives?

Perceptions of the Clinical Learning Environment

Students who report a negative experience during a clinical rotation will likely report encumbered learning opportunities and poor outcomes (Napthine, 1996). The next section of the literature review specifically focuses on the learning experience during clinical rotations. Although investigating clinical learning is possible using quantitative and qualitative design, the bulk of the literature reviewed for this section maintained a qualitative design focus.

The clinical environment is the only place healthcare students can experience true direct patient care and, thus, its necessity and importance to practitioner development is tremendous. Dolmans, Wolfhagen, Heineman, and Scherpbier (2008) reported on the factors inhibiting learning in the clinical setting such as negative attitude toward students, providing insufficient feedback to students, limited procedural opportunities, and rotations with poor organization. Interaction with staff is probably the most important aspect impacting learning. Nursing students report less favorable learning experiences when they are exposed to an unsupportive atmosphere and do not feel a sense of camaraderie or acceptance with the nursing personnel (Berntsen and Bjørk, 2010; Papp, Markkanen, and von Bonsdorff, 2006; Ranse and Grealish, 2006). Nursing students

report feeling more like a nuisance versus colleague during clinical rotations (Papp et al, 2006). Perhaps the feeling of inclusion motivates participation and enthusiasm in learning activities. The social aspects of the hospital environment appear to strongly influence nursing students and foster learning in this setting (Levett-Jones and Lathlean, 2008; Shin, 2000; Reider and Reiley-Giomariso, 1993). In assessing belongingness, Levett-Jones and Lathlean (2008) determined,

Students felt more empowered and enabled to capitalise [sic] on the available learning opportunities when they felt they had a legitimate place in the nursing team, and they were often more self-directed and independent in their approach. They were also more confident in negotiating their learning needs, in asking questions and in questioning practice. (p. 107)

Student nurses prefer to feel appreciated, accepted and part of a team (Papp, 2006; Ranse, 2006; Nolan, 1998). Acceptance from other nurses creates a belief that the staff has taken an interest in student learning (Ranse, 2006). In a qualitative storytelling piece, Jackson and Mannix (2001) discovered, "...clinical learning is the result of interactions between students and clinical nurses, in that the attitudes and behaviors of nurses employed at the clinical placement site were revealed as crucial variables for students" (p. 273). Students begin to feel empowered and valued thus reporting a greater level of participation in clinical activities (Ranse, 2006). Conversely, when feeling unwelcome most nursing students will report dissatisfaction with the experience and believe their clinical learning is unsuccessful (Ranse, 2006; Jackson and Mannix, 2001). Interestingly, Muldowney and McKee (2011) reported similar findings from experienced nurses newly assigned to an intensive care unit setting. Using a quantitative questionnaire, the authors

surveyed registered nurses with at least one year of experience, the majority having had 2-5 years of experience, about their perceptions of the clinical learning environment. The results indicate that interpersonal relationships, the commitment of educational staff, clinical nurse managers' commitment to education were the leading factors contributing to the participants' perceptions of the clinical learning environment (Muldowney and McKee, 2011). The authors demonstrated that non-students also perceive interpersonal relationships with the unit staff as contributing to their learning. The authors commented on how interpersonal relationships and the willingness of staff to engage in teaching behaviors are a significant impetus to unit satisfaction and anxiety reduction.

Satisfaction with the learning environment is better in units that have good nurse interpersonal relationships, where staff are approachable, are open to questions and provide explanations clinical learning is promoted. Clinical nurse managers' and clinical educational staff's commitment to supporting learning are also essential to providing a good clinical learning environment. Ensuring that all nursing staff are engaged in a teaching relationship is thus a vital step in promoting an effective clinical learning environment. (Muldowney and McKee, 2011, p. 207)

Although the primary focus of this section is on student perceptions, I believe the findings by Muldowney and McKee have significance to this literature review. The nurse participants in the Muldowney and McKee study were serving in a "student" capacity. After their initial training in the intensive care unit they report similar barriers to learning as in-experienced student nurses report during clinical rotations. I believe this demonstrates the importance of interpersonal relationships and the instructors' willingness

to teach on students. The available literature included in this section of the literature review appears to send a clear message that nursing students and experienced nurses value being identified as an important member of the healthcare team.

Issues related to feedback are a potential hindrance to learning in the clinical environment. Feedback was vital to learning because it allowed the students to see “...what they had and had not yet learned” (p. 359). In a timeless special communication to the medical establishment, Dr. Jack Ende (1983) addresses the importance of feedback in the clinical environment. He writes,

In clinical medical education, the importance of feedback extends beyond pedagogy. The goal of clinical training is expertise in the care of patients. Without feedback, mistakes go uncorrected, good performance is not reinforced, and clinical competence is achieved empirically or not at all. (Ende, 1983, p. 778)

The timing of feedback is important as well. Branch and Paranjape (2002) suggest feedback should be given liberally in the beginning and should be formal in nature during the mid-point of the rotation. There is an assumption that feedback as well as competency assessment are performed properly and with diligence. It is potentially erroneous to assume these requirements occur based solely on the completion of a clinical rotation (Daelmans, Hoogenboom, Donker, Scherpbier, Stehouwer and Van Der Vleuten, 2004; Scott, Irby, Gilliland, and Hunt, 1993). Using a questionnaire and quantitative analysis, Daelmans et al. (2004) assessed medical students’ views on supervision, feedback and assessment while attempting a variety of clinical procedures, e.g. taking a history, physical examination, formulating a differential diagnosis, evaluating treatment results, etc., during a clinical clerkship. The authors reported that supervision was scarce,

feedback was provided primarily by under-qualified individuals, i.e. residents, and the final assessment occurred most often during the oral exam versus the progress interview at the conclusion of the rotation. The authors concluded, “The results suggest there is ample room for improvement with regard to each of these factors” (Daelmans et al., 2004, p. 311). This raises the question for this study: Are respiratory care students receiving the assessment and feedback they desire during neonatal and pediatric critical care clinical rotations?

Ende (1984) states, “In clinical medical education, the importance of feedback extends beyond pedagogy. The goal of clinical education is expertise in the care of patients. Without feedback, mistakes go uncorrected, good performance is not reinforced, and clinical competence is achieved empirically or not at all” (p. 778). The timing of feedback as well as the occurrence of feedback is crucial to clinical education. Regular use of feedback during and following procedural activities is preferred among nursing and medical school students (Dolmans et al., 2008; Perera, Lee, Win, Perera and Wijesuriya, 2008). Lack of feedback is not only a concern among nursing and medical school students, but appears to be an issue for residents, as well (Branch and Paranjape, 2002). Physician residents report an inadequate amount of feedback, as well as, receiving feedback from less qualified supervisors (Daelmans et al., 2004). Physician residents also report confusion as to whether they are receiving actual feedback or an evaluation (Deketelaere, Kelchtermans, Struyf and De Leyn, 2006). Evaluation provides a summative assessment, where as feedback is formative in nature. Although both offer important information to the students, feedback and evaluation are not interchangeable.

When considering the requirement of clinical skills proficiency, it is important for the student to receive timely, well thought-out feedback during clinical rotations.

Performing clinical procedures intuitively should lead to greater learning; however, the opportunity to perform clinical procedures may be somewhat suspect. Remmen et al. (1999) reported issues during medical clerkship rotations for three medical schools. Per the medical schools' curriculum the students were supposed to perform each of the body systems skills one time. However, the participants in the Remmen et al. (1999) study demonstrated that no students from any of the medical schools met the curriculum skills competency requirement. As a result, the students did not perform all of the intended skills during their clerkship rotations. The authors attributed the findings to three possible factors, i.e. attention to skills training, the learning strategies in the environment, and oversight of the rotation by the medical school. Good clinical supervision can attempt to offer meaningful learning opportunities when procedures are infrequent. Clinical directors can increase the likelihood of clinical opportunities by limiting the number of students per group. In general maintaining smaller clinical groups will allow the students to achieve greater practice on the available procedures. As stated above, clinical directors need to communicate with students to determine if the appropriate numbers of procedure attempts are performed during each rotation. Remmen et al. also support this recommendation. Another factor impacting student learning in the clinical environment is the number of procedural exposures. Depending on the patient census in a given facility, the students may encounter few procedural opportunities during a rotation. Although this was suggested by Dolman et al. (2008) as an important

concern among students, in large part, this is beyond the control of the clinical directors and instructors.

The last issue identified above relates to the organization of the clinical rotation. It is clear that students need guidance during clinical rotations (Dolmans et al., 2008).

Simply “showing up” for the rotation without goals and objectives will offer little more than confusion from the students, clinical instructors and staff (Leners, Sitzman and Hessler, 2006). Berntsen and Bjørk (2010) associated the satisfaction with a nursing home rotation to the level of supervision and guidance provided to the students. Adequate supervision and guidance can encourage an environment of learning for the students.

Therefore, it is easier for the students to adapt to their role as learners and move forward from a peripheral to a legitimate position in the clinical environment (Lave & Wenger, 1991). Although dated but very much pertinent today, Fraser (1989) suggested that student learning outcomes are improved if the clinical learning environment is adjusted to meet student perceptions. Student perceptions of the clinical environment offer a unique perspective of the psychosocial characteristics of the environment (Fraser, 1989).

“Students are at a good vantage point to make judgments about classrooms because they have encountered many different learning environments...” (Fraser, 1989, p. 308) This is especially true for health profession students due to their dual exposure to the classroom and the clinic environments. They have a unique vantage point to observe clinic. In some a global view of the clinic environment can be achieved.

Integration of theory and practice is another important characteristic of the clinical learning environment. In some ways, the clinic can reinforce classroom material. The use of evidenced-based guidelines in the clinical setting has strong support.

However, a licensed physician primarily determines medical management of patients and care decisions are based on the physician's experience. In addition, there is no single standard of care for all medical procedures. Hospitals are required to operate within acceptable accreditation guidelines, but ordered procedures can deviate from accepted evidence-based practice. When students enter the healthcare setting with knowledge focused on best practice, a paradox can exist. It has been reported that students will receive ridicule when attempting to practice based on textbook standards versus common clinic practice (Shin, 2000). Healthcare students expect to practice in a manner consistent with classroom teaching. Unless the clinical instructor is a paid faculty member of the healthcare program, it is likely that a divide will exist. When the students are placed with a hospital staff member, there is the opportunity for significant differences between classroom and clinic learning.

Perceptions of Clinical Instructors

When students are sent into the clinical environment it would seem ideal for directors of clinical programs to recruit a knowledgeable and dedicated clinic instructor to guide the students during the rotation. The most important clinical instructor characteristics, as reported by Hefernan, Hefernan, Brosnan, and Brown (2009), included being supportive of the student, being approachable, understanding the student's role, and understanding the preceptor's role. Byrd, Hood and Youtsey (1997) assessed the factors that senior nursing students perceive as important to a successful learning partnership during clinical rotations. Knowledge of the preceptor's role in the teaching process was also reported as a highly important characteristic. In a similar study, Coates and Gormley

(1997) investigated the views regarding preceptorship held by nursing students and found the role of educator/teacher was most important. Once again, the student perceptions of current clinical instructors offer valuable information to directors of clinical education.

The clinical instructor is responsible for integrating the student into the clinical environment. Teaching in a clinical setting has challenges because the instructor is required to focus on the needs of the student and the needs of the patient. “The goal is to provide settings and experiences in which learning can occur with minimal disruption to agency operations and patient needs and expectations” (Burns, Beauchesne, Ryan-Krause and Sawin, 2006, p. 175). The Instructor is usually an advanced practitioner with numerous years of clinical experience. Ideally, the clinical instructor has been trained in the nuances of clinical teaching and adult learning. There is a belief among some nursing students that the general nursing staff does not possess the knowledge and preparation required for the role of clinical instructor (Sharif and Masoumi, 2005). Many of the students interviewed by Sharif and Masoumi (2005) felt the staff nurses held more of an evaluative role versus a teacher role. Although the clinical instructor may not possess the same amount of experience related to academic or clinical teaching, he/she can provide the bridge between classroom activities and clinical activities. It is the responsibility of the clinical instructor to engage the student into patient care and ideally re-examine many of the procedures covered during classroom instruction. In addition, the clinical instructor will attempt to lessen student anxiety by providing an atmosphere conducive to learning. Anxiety will reemerge and intensify once students are placed in an unfamiliar setting or when students lose confidence in their clinical instructor (Charleston and Happell, 2005). Fear of failure is another anxiety producing stimulus. Students seek validation for their

actions and desire to perform procedures correctly. The clinical instructor is integral in evaluating clinical competency and providing feedback.

Students develop strong views regarding the clinical ability and usefulness of their clinical instructor. In some cases the students were matched with staff nurses versus a head nurse. One student stated,

Some of the nursing staff have good interaction with nursing students and they are interested in helping students in the clinical placement but they are not aware of the skills and strategies which are necessary in clinical education and are not prepared for their role to act as an instructor in the clinical placement. (Sharif and Masoumi, 2005, para. 2)

Clinical instructors serve many roles from facilitating professional socialization to evaluating and teaching procedural competencies. An inexperienced and unprepared clinical instructor may interfere with program and student goals. Careful selection and preparation of the instructor prior to assuming the role with the students is extremely important. Nursing students noticed the difficulties in having a nurse role and a student at the same time (Sharif and Masoumi, 2005). There was a role identity problem (practical nurse versus a register nurse (RN)) thus some students felt they were not performing “professional nursing.” The students believed they were performing routine activities that someone with less education could perform. The nursing students were getting a 4-year education and felt they should have a higher level of responsibility.

Coping with the uncertainty of the clinical rotation was a major issue identified by nursing students and this feeling of uncertainty changed as support from the preceptor changed (Charleston and Happell, 2005). In this study, uncertainty revolved around

unclear expectations of the practicum, feeling unprepared and lack of information about the instructor's role. It is clear from research cited above that the clinical instructor plays a vital role in the success of the clinical rotation. The quality of the rotation was viewed much more positively when preceptors offered support towards learning and student rotations (Charleston and Happell, 2005). The culture and philosophy of the hospital ward toward teaching impacted the students' experiences. "Students expressed being more relaxed and able to learn when the attitudes and behaviors and support of the preceptors were welcoming, nurturing and inclusive of the students (Charleston and Happell, 2005, p. 308)." Fear and apprehension impact learning and confidence and quality clinical experiences certainly impact an individual's interest within a particular field/area.

Preceptors can also stall student progress and learning. Depending on the arrangement established between the preceptor, the program faculty, and the clinical location, a number of factors can develop that are counterproductive to student achievement. Kaviani and Stillwell (2000) evaluated the success of a nurse preceptor preparation program and commented on the barriers impacting the effectiveness of the preceptor to achieve student success. Through focus group interviews, the authors determined that staff attitudes, number of instructors, the instructor's workload, duty roster, supportive culture of the practice setting, lack of time to spend with students, collegial support and regular contact with academic staff, and recognition of efforts contribute to the instructor/student relationship. Students indicated having a role model to guide their practice increased their effectiveness. Wilson, Bodin, Hoffman, and Vincent (2009) surveyed neonatal nurse practitioner instructors and discovered the following

behaviors that facilitated student development and critical thinking: flexibility, respect, trust, and skepticism. Wilson et al. also discussed instructor behaviors that hindered student development and critical thinking, such as role consciousness, lack of questioning attitude, constraint, and lack of safety. In some cases preceptors are selected based on availability versus being ideally suited or trained for the role. Myrick and Barrett (1994) discussed the ideal versus the availability scenario and concluded, “It is the implementation of preceptorship which determines whether the goals of teaching/learning are achieved...it is not the strategy of preceptorship which is questionable or flawed, but rather the manner in which it is implemented” (p. 197). Once again, the directors of clinical education programs need to continuously assess the success of clinical education. When students are on the front lines, they are a primary source to provide necessary information about the clinical instructor.

Recruiting and encouraging a clinician to assume the role of clinical preceptor is not an easy task. Altmann (2006) completed an assessment of preceptorship in nursing education. Using a questionnaire, the participants ranked factors influencing preceptor selection. In order of most important to least important, nursing school directors and deans believed the following criteria were integral to preceptor selection: clinical competence; commitment to preceptor role; interest, ability, willingness to teach; availability; effective communication skills; professional conduct; skilled use of nursing process; ability to deal with conflict; ability to complete performance evaluation; active involvement in own professional development; and knowledge and use of nursing research in clinic. Wilson et al. (2009) assessed neonatal nurse practitioners and nurse practitioner programs to determine the level of support offered to clinical preceptors and

the expected support by preceptors. Program directors indicated that one of the challenges of recruiting clinical preceptors is a lack of resources to pay the preceptors. Interestingly, when preceptors were asked about the types of support activities they viewed as being important, compensation was not a major priority. Preceptors indicated that clinical visits from program faculty and frequent communication to be more important. It seems plausible that greater financial resources would alleviate the struggles faced when attracting quality preceptors; however, that does not appear to be the case and non-financial alternatives of support that preceptors' desire do exist. Additional examples of non-financial support options include formal recognition of teaching assignment, training workshops and continuing education (Wilson et al., 2009; Rodger, Webb, Devitt, Gilbert, Wrightson and McMeeken, 2008).

Situated Learning/Cognition

The reliance on the clinical environment as a place to learn is ubiquitous among the allied health and non-allied health professions. When considering the field of medicine, there are two phases of the curriculum, the pre-clinical activities and the clinical activities. There is an enormous amount of theoretical information forced upon each student during the pre-clinical activities. Much of this information directly relates to patient care; however, the student may not truly appreciate the information until there is an authentic learning opportunity. The same holds true for respiratory care curricula. The example that follows is from my personal experience and relates to our respiratory care students. When teaching breath sound identification I describe, using words, the characteristics of each adventitious sound, i.e. wheezing, rhonchi, crackles. My

PowerPoint™ slides are full of textbook explanations and definitions of each breath sound and I point out the differences between each sound. I explain that wheezes and rhonchi are continuous sounds and crackles are discontinuous sounds. I explain that crackles tend to occur on inspiration and wheezes on expiration. The definitions of wheezes, rhonchi, and crackles are so abstract to someone who has never heard the sounds that more than likely these explanations are very difficult to grasp. As an extension to the explanation, I play a recording of each sound and the students begin to nod and express understanding. However, the true understanding does not occur until the students perform chest assessment and specifically auscultation on actual patients. The students must actively use the tools, i.e. the stethoscope, to listen to the sounds that are produced as air moves into and out of the lungs. When we discover a patient that has crackles when inspiring, the students flock to the room because they want an authentic experience. The students want to hear the abnormal breath sound as the patient breathes in and out. There is no verbal explanation that can truly provide a perfect description and understanding of breath sounds. However, without the definitions and explanations, i.e. the concepts, provided in class the students would likely struggle with differentiating the sounds and the pulmonary processes that create the sounds. It would be a challenge to categorize each sound and then accurately provide therapy based on the assessment. It would be more of a challenge to describe the sounds when reporting to other healthcare providers. Both the classroom and the clinical experiences need to be combined to create a complete understanding. Now I chose a simple example to express this point. Additional examples could be used for other therapeutic requirements in the field of respiratory care, e.g. pulmonary function testing, mechanical ventilation, airway

clearance. The next section of this literature review will address the theoretical perspective guiding this study.

Theorists prior to Lave et al. (1991) and Brown et al. (1989) provide the foundation for situated cognition. Lev Vygotsky (1978) focused his efforts on child cognitive development and social interaction. In *Mind and Society* (1978), Vygotsky wrote, “The most significant moment in the course of intellectual development, which gives birth to the purely human forms of practical and abstract intelligence, occurs when speech and practical activity, two previously completely independent lines of development, converge” (p. 24). John Dewey (1998) stressed the importance of experience in our development. He wrote,

A primary responsibility of educators is that they not only be aware of the general principle of the shaping of actual experience by environing conditions, but that they also recognize in the concrete what surroundings are conducive to having experiences that lead to growth. Above all, they should know how to utilize the surroundings, physical and social, that exist so as to extract from them all that they have to contribute to building up experiences that are worth while. (p. 35)

There is interdependence between the concepts to be learned, the culture within which the learner will be involved, and the activity to be performed (Brown et al., 1989). The concepts must be taught correctly and clearly to the learner. These early concepts are used to form the initial theoretical understanding of the activity. The culture in which the learner is involved should have some familiarity with this particular concept. If the learner is sent to a clinical facility that does not require staff to routinely engage in a certain clinical skill, then the concept will likely be lost. If the practitioners that represent

this culture are unfamiliar or resistant to engage in the skill, then the learner's views will potentially mirror the views of those around him/her. "We have a tendency to adopt the behavior and belief systems of new social groups" (Brown et al., 1989, p. 34). In addition, the oversight by the clinical experts should be readily available. Once again, it is highly important to recruit, train and evaluate clinical instructors. Lastly, the activity must be completed correctly and it must be authentic. Even practice activities on manikins cannot provide an identical learning experience as a real-life encounter. Learning is best achieved when concept, culture, and activity are blended together (Brown et al, 1989).

More recently, Herrington and Oliver (2000) completed a three-part study on situated cognition and authentic learning environments. The authors surveyed the available literature to develop an element framework consisting of the following nine critical characteristics essential to a situated learning environment. Next, they developed a multimedia program incorporating the nine characteristics, and finally they investigated, students' perceptions of the multimedia experience using qualitative methods. These nine critical components serve as guidelines for ideal practice. I will briefly discuss each characteristic below.

Authentic Context. The context or physical environment in which the knowledge will be used should be authentic. The learning environment should mimic the complexity of real-life events and scenarios. Herrington and Oliver (2000) demonstrated that students value authentic context and may prefer this style of teaching to a traditional classroom situation devoid of authenticity. Brown et al. (1989) make the point that success on

activities within the school culture, i.e. devoid of real-life context, may not have widespread applicability or translate into success outside of this culture.

Authentic Activities. The activities within the learning environment should have relevance to real-life activities. If teachers expect students to acquire the skills associated with being an expert, then authentic tasks should be presented in authentic contexts (Choi and Hannifin, 1995). The activity must have intrinsic value to the learner beyond the importance of making a good grade or pleasing the teacher or parent (Newmann, 1991). A student's motivation to explore further understanding is likely to increase when a task is viewed as intrinsically rewarding (Choi and Hannifin, 1995). Authentic activity provides experience that inevitably shapes and hones tools (Brown et al, 1989).

Access to Experts. Students should have access to individuals with expertise related to the task. The content experts should provide guidance and leadership when students are progressing toward a solution and especially when progress has slowed. Experts possess numerous points of view that they acquired since beginning their journey as a novice. "Because novices have not been immersed in the phenomena being investigated, that are unable to experience the effects of the new information on their own noticing and understanding" (Cognition and Technology Group at Vanderbilt, 1992, p. 68).

Multiple roles and perspectives. The learning environment should offer perspectives from different points of view. In addition, the opportunity for students to express their points of view is important to the learning environment. Ultimately, we all do things slightly different and small group activities allow each student to listen and discuss a variety of perspectives. One could view these differences as a form of pseudo-

expertise for the novice. This pseudo-expertise, when shared with other learners, may offer a perspective that can realign thinking and understanding to other novices.

Collaborative Construction of Knowledge. Small group learning should be the focus versus individualized learning. Resnick (1987) points out that rarely do we work individually in the real world. Most of our activities, both work and play, occur in social situations. Collaboration among students creates an opportunity for multiple perspectives and fosters incentives for group achievement. “If, as we propose, learning is a process of enculturation that is supported in part through social interaction and the circulation of narrative, groups of practitioners are particularly important, for it is only within groups that social interaction and conversation can take place” (Brown et al, 1989, p. 40).

Promote Reflection. Reflection allows students to process and compare current problem-solving abilities against a background of recent experiences. The background develops from watching other students, watching the experts, and from their own internal cognitive model (Collins, Brown, and Holum, 1991). Through reflection the student should replay the steps or actions that are integral to completing the activity. The student should once again make comparisons between their ability level and that of the expert. A more advanced student will usually create a greater degree of detail in the replay (Collins et al., 1991).

Promote Articulation. Sharing of knowledge through informal and formal avenues provides an opportunity for the students to make connections to their cognitive frameworks (Herrington and Oliver, 2000). Translation of tacit knowledge previously created to explicit knowledge is required to further the student’s understanding of the

task. The preparation for articulation occurs through collaboration with peers and reflection on past experiences (Herrington and Oliver, 2000).

Provide Coaching and Scaffolding. The teacher should be readily available to coach the students and guide their efforts. Coaching helps to remind the student of tasks that have been overlooked or forgotten (Collins et al., 1991). By directing the students through hints, feedback, and modeling, the teacher attempts to get the student's performance closer to that of an expert (Collins et al., 1991). Scaffolding consists of the numerous kinds of support the teacher provides to the students. The teacher can use subtle cues to stimulate thinking or the teacher can perform portions of the task when students are unable to do so. "A requisite to such scaffolding is accurate diagnosis of the student's current skill level or difficulty..." (Collins et al., 1991, p. 14). At an opportune time, the teacher should fade into the background to allow the students to take the lead.

Authentic Assessment. "Such authentic assessments would seek to gauge not only the depth and extent of declarative (or theoretical) knowledge, but also procedural (or practical) knowledge..." (Sweeney and Paradis, 2004, p. 212). Assessment should be timely and integrated into the tasks. All evaluations should be based on the context of the task and should accurately assess the knowledge and performance the students were originally tasked to acquire. Students should be involved in the development of assessment strategies.

The ideal scenario is one in which there is a positive transfer of training from classroom instruction to the clinical environment. Learning within the clinical environment has been described as field-based experiences (Lewis and Williams, 1994). Although used by numerous professions in addition to medicine, field-based experiences

offer the practical exposure that is missing from classroom lecture. Learning within this environment is an active process that requires students to engage in the activity and reflect on their actions. Students are pushed to "...see, learn about, and examine their own situations in action as they interact with others at work" (Lewis and Williams, 1994, p. 10). Clinical rotations are full of new and challenging encounters that further expand the current level of understanding. The clinical environment should mirror the future job responsibilities for the students. Our ability to mentally advance following patient and staff exposures may determine our success in a particular area and our desire to further our education. It seems plausible that our interpretation of an experience might propel us toward a path of continued learning.

Summary

The reviewed literature demonstrated the importance of the clinical environment, the perceptions held by students toward learning in the clinical environment and the perceptions of the clinical instructor. Clinical rotations offer a unique opportunity for students to communicate among staff, work in groups, perform job-related functions, and participate in the culture of the organization. The clinic environment also allows clinical instructors to practice their craft but also educate the next generation of healthcare providers. The healthcare student builds a repository of facts and uses numerous memorization aids to store as much information as possible prior to clinical exposure. The clinical instructor must guide the students and bridge the gap between theory and practice. Although there is a large amount of literature related to the clinical environment and some health professions there is a dearth of literature available to answer our research

questions. The next section in this dissertation will address the methodological procedures planned for this study.

CHAPTER III

METHODOLOGY

The purpose of this study was to gain an understanding of the limitations and strengths of neonatal and pediatric critical care clinical rotations to adequately prepare respiratory care students. The problem this research study addressed was based on Walsh et al. (2011) conclusions that new respiratory care graduates are underprepared for the neonatal and pediatric critical care environment due to inadequate clinical preparation while completing the degree requirements. It was anticipated that this study would either refute or corroborate the perceptions expressed by departmental managers and educators (Walsh et al., 2011) and provide additional insight into neonatal and pediatric critical care clinical rotations. Therefore, I addressed the problem stated above by exploring the lived experiences of respiratory care students, respiratory care clinical instructors and directors of clinical education using a phenomenological approach. Creswell (2009) says, "...qualitative research is exploratory, and researchers use it to explore a topic when variables and theory base are unknown" (p. 98). Although neonatal and pediatric clinical education is a ubiquitous part of all respiratory care programs, a project of this type was not located during the literature search and review. The research questions for this project were presented in Chapter 1 and have been restated below.

1. What limitations and strengths do respiratory care students perceive exist for the neonatal and pediatric critical care clinical rotation?
2. What limitations and strengths do directors of clinical education perceive exist for the neonatal and pediatric critical care clinical rotation?

3. What limitations and strengths do clinical instructors perceive exist for the neonatal and pediatric critical care clinical rotation?

Using a qualitative methods approach, the researcher gained an understanding of the perspectives of the participants regarding the neonatal and pediatric critical care clinical rotation. Specifically, this research project investigated the perceptions of the respiratory care students, clinical instructors and directors of clinical education specifically related to the activities of the neonatal and pediatric critical care clinical rotation. By exploring the lived experiences of these three groups the researcher gained insight into the facilitators and hindrances of learning in the clinical environment. “Authentic activity, as we have argued, is important for learners, because it is the only way they gain access to the standpoint that enables practitioners to act meaningfully and purposefully” (Brown et al., 1989, p. 36). I included prompt statements within my interview guide to glean workplace learning, i.e. skills competency and practice, information that fosters in the authentic environment of the clinic. These data contributed answers to my research questions and are consistent with my theoretical perspective and research design.

Description of the Study Site

All respiratory care programs are required by CoARC to offer clinical experiences, including rotations within the neonatal and pediatric environments, of sufficient quality and duration to meet program goals and acquire competencies needed to practice (2010). The acute care hospital site represents the primarily location in which respiratory care students participate in clinical rotations. In addition, the acute care

hospital represents the only site for neonatal and pediatric critical care rotations. There are multiple levels of neonatal care and pediatric care offered by the traditional acute care hospital. Tables 3.1 and 3.2 contain the level designations as defined by the American Academy of Pediatrics for the neonatal care and the pediatric care. The qualitative interviews were conducted via phone or face-to-face interaction. The face-to-face interviews were conducted in a designated location convenient for both the researcher and interviewee.

Table 2 Neonatal Intensive Care Unit Level of Care Designation

Neonatal Intensive Care (American Academy of Pediatrics Committee on Fetus and Newborn, 2004)
<p>Level I – basic neonatal care Stabilize and provide care for infants born at 35-37 weeks gestation; stabilization of ill newborns and <35 week infants until transfer to a specialty facility</p>
<p>Level IIA – specialty neonatal care Care of infants born at >32 weeks gestation with a birth weight \geq 1500 g who do not have subspecialty care needs.</p>
<p>Level IIB – specialty neonatal care Can provide Level IIA plus mechanical ventilation for < 24 hours or continuous positive airway pressure.</p>
<p>Level III – subspecialty neonatal intensive care</p>
<p>Level IIIA – care for infants born at > 28 weeks gestation and weighing > 1000 g; provide conventional mechanical ventilation, minor surgical procedures</p>
<p>Level IIIB – care for infants born at \leq 28 weeks gestation and weighing \leq 1000 g; provide advanced respiratory support high-frequency mechanical ventilation and nitric oxide, major surgical procedures</p>

Table 3. Pediatric Intensive Care Unit Level of Care Designation

Pediatric Intensive Care Unit (Rosenberg, D.I., Moss, M., Section on Critical Care, and Committee on Hospital Care, 2004)
Level I PICU - care for a wide range of complex, progressive, and rapidly changing medical, surgical, and traumatic disorders occurring in pediatric patients of all ages, excluding premature newborns.
Level II PICU - provide stabilization of critically ill children before transfer to another center or to avoid long-distance transfers for disorders of less complexity or lower acuity. Subspecialties are not required.

Research Method

A qualitative research design provides a greater level of exploration of the perceptions of the clinical experience versus a quantitative design that uses predetermined categories and choices. “Qualitative research is a means for exploring and understanding the meaning individuals or groups ascribe to a social or human problem” (Creswell, 2009, p. 4). “Approaching fieldwork without being constrained by pre-determined categories of analysis contributes to depth, openness, and detail of qualitative inquiry” (Patton, 2002, p. 14). Use of a qualitative methodology allowed for the discovery of variables that potentially would have remained hidden from quantitative assessment techniques, e.g. pre/post-tests and surveys. “The process of research involves emerging questions and procedures, data building from particulars to general themes, and the researcher making interpretations of the meaning of the data” (Creswell, 2009, p. 4). Allowing the participants to fully describe their perceptions in an open, comfortable environment provided qualitative data that probably would have been inaccessible using a quantitative technique. Inductive assessment of study variables is possible using a qualitative approach versus deductive assessment using a quantitative technique.

“Quantitative measures are succinct, parsimonious and easily aggregated for analysis...By contrast qualitative findings are longer, more detailed, and variable in content...Yet, the open-ended responses permit one to understand the world as seen by the respondents” (Patton, 2002, p. 20-21). Denzin and Lincoln (2011) have identified a diversity of methods to guide qualitative inquiry—grounded theory, phenomenology, ethnography, case study, etc.—and an equally diverse set of data gathering techniques—interviewing, observing, focus groups, visual methods, etc.

The primary focus of this study was on the perceptions held by students, directors of clinical education, and clinical instructors related to the neonatal and pediatric clinical rotation. The interest on the lived experience of the identified groups and the use of a phenomenological approach helped capture the data to answer my research questions and generate discussion for additional research.

Phenomenological studies focus on a common lived experience. “The fundamental model of this approach is textual reflection on the lived experiences and practical actions of everyday life with the intent to increase one’s thoughtfulness and practical resourcefulness or tack” (van Manen, 1990, p. 4). The phenomenological method allows researchers to gain the “very nature of the phenomenon” so that each person’s “thing” is discovered (van Manen, 1990, p. 10). This exploration into how human beings make sense of experiences, of phenomena, of personal encounters allows the researcher to understand how these experiences are transformed into consciousness on an individual level and a shared level (Patton, 2002). “This requires methodologically, carefully, and thoroughly capturing and describing how people experience some phenomenon – how they perceive it, describe it, feel about it, judge it, remember it, make

sense of it, and talk about it with others” (Patton, 2002, p. 104). This approach allows the researcher to gain a deeper understanding of the way we experience the world (van Manen, 1990). “Anything that presents itself to consciousness is potentially of interest to phenomenology, whether the object is real or imagined, empirically measured or subjectively felt” (van Manen, 1990, p. 9).

In-depth interviews are a necessary component of the phenomenological method. In general, qualitative interviews allow participants to “open up” on their experiences and to share the meanings they have created. Phenomenology was a logical fit as a research design for this study because it provided the guidance necessary to gather perceptions of the neonatal and pediatric clinical experiences of the participants and ultimately complete the data collection.

Profile of the Participants

Fourteen participants agreed to share their perceptions of the clinical experience for this project. As a reminder, this research project was not designed to compare bachelor degree programs to associate degree programs. However, I recruited subjects from associate degree programs and bachelor degree programs as a way to give a “voice” to both types of educational paths. The participant make-up is as follows:

Respiratory Care students:

Bachelor Degree program student = 6

Associate Degree program student = 4

Clinical Instructors:

Bachelor Degree program clinical instructor = 1

Associate Degree program clinical instructor = 1

Directors of Clinical Education:

Bachelor Degree program director = 1

Associate Degree program director = 1

Purposeful sampling was used to recruit participants from the designated respiratory care groups. All students were required to be currently enrolled in a respiratory care program to participate. Clinical instructors and directors of clinical education were recognized faculty associated with respiratory care programs. The Level I Neonatal Intensive Care Unit (NICU) does not utilize respiratory therapists for routine care; therefore, this study excluded any student and clinical instructor who may have rotated through a level I NICU. See table 3.1 for NICU levels. Because therapists can be involved in both levels of PICU this study did not exclude students or clinical instructors based on the PICU they rotated through. See table 3.2 for the PICU levels.

In an effort to maintain participant anonymity I have limited the information provided on each participant. Also, gender-neutral pseudonyms have been used in place of actual participant names. Participants ranged in age from the third to the sixth decade. As expected directors of clinical education and clinical instructors tended to be older than the students. Of the fourteen participants, ten were female. Participant ethnicities consisted of African-American, Caucasian, and Hispanic. The amount of time in the neonatal and pediatric environments ranged from 4-14 days. Students and clinical

instructors completed either eight-hour shifts or twelve-hour shifts. The time since completing the neonatal and pediatric rotation ranged from one academic semester to three academic semesters. All students completed adult floor and adult intensive care unit rotations prior to the neonatal and pediatric rotation. See table 3.3 for additional student participant demographic data. Due to the small number of director of clinical education and clinical instructor participants, additional demographic data will not be supplied for these participants to protect their identity.

Table 4. Student Participant Demographic Data

Participant Pseudonym	Previous Clinical Experience	Preparation	Type of Clinical Instructor
Addison	Adult floors, Adult Intensive Care Unit	Didactic Class/Laboratory activities	Paid clinical instructor
Bailey	Adult floors, Adult Intensive Care Unit	Didactic Class/Laboratory activities	Preceptor
Campbell	Adult floors, Adult Intensive Care Unit	Didactic Class/Laboratory activities	Paid clinical instructor
Dakota	Adult floors, Adult Intensive Care Unit	Didactic Class/Laboratory activities	Paid clinical instructor
Harley	Adult floors, Adult Intensive Care Unit	Didactic Class/Laboratory activities	Paid clinical instructor
Jordan	Adult floors, Adult Intensive Care Unit	Didactic Class/Laboratory activities	Preceptor
London	Adult floors, Adult Intensive Care Unit	Didactic Class/Simulation/NRP	Preceptor
Mel	Adult floors, Adult Intensive Care Unit	Didactic Class/Simulation/NRP/PALS	Preceptor
Parker	Adult floors, Adult Intensive Care Unit	Didactic Class/Simulation/NRP/PALS	Preceptor

Table 3.3 (continued): Student Participant Demographic Data			
Sage	Adult floors, Adult Intensive Care Unit	Didactic Class/Simulation/NRP/PALS	Preceptor

Participant Recruitment and Selection

Purposeful sampling was used to recruit participants into the project. “The logic and power of purposeful sampling lie in selecting information-rich cases for those from which one can learn a great deal about issues of central importance to the purpose of the inquiry...” (Patton, 2002, p. 230). Texas has thirty-six respiratory care programs across the state with seven programs between San Antonio and Waco. The programs along the I35 corridor consists of two baccalaureate degree programs and five associate degree programs. The researcher initially focused recruitment efforts on the programs along the I35 corridor from San Antonio to Waco. Of the twelve total participants, six represented associate degree programs and eight represent bachelor degree programs. See the participant make-up addressed above. The researcher also contacted programs and accepted participants from outside of the I35 corridor when individuals expressed an interest to participate in the interviews.

The program directors for respiratory care schools were contacted by email to explain the purpose of the project and request contact information, i.e. email addresses or cell phone numbers, for their students, clinical instructors, and director of clinical education. Once contact information was received, an email was sent to each students, clinical instructors and directors of clinical education explaining the purpose of the project and ascertaining their interest in participating. The research also encouraged the program directors to share the initial contact email with other programs that might be

interested in participating. Participants were selected to participate based on order of response, i.e. first come, first served. A list of student names was generated to serve as potential participants if needed. Additional participants were needed to achieve data saturation, thus the researcher contacted interested participants from a list of students. Students were required to complete at least some of the neonatal and pediatric rotation prior to being a participant in this study. Demographic questions within the interview guide provided the researcher with further information on each student, clinical instructor and director of clinical education and the level of experience they have in their respiratory programs.

Data Collection

This dissertation sought the perceptions of three groups of individuals with a focus on the phenomenon of lived experience during a neonatal and pediatric clinical rotation. The project consisted of face-to-face and phone interviews using a semi-structured interview guide. See appendices B-D. The open-ended questions were developed to keep the participant focused on clinical rotations but also allow for the open expression of their thoughts. In addition to the open-ended questions, each participant was asked to answer demographic questions. These demographic questions were included to provide insight into the respiratory care educational experiences prior to the neonatal and pediatric clinical rotation. Interviews were conducted in a convenient, non-threatening location chosen by the interviewee. Typically locations for face-to-face interviews included coffee houses, empty offices within area hospitals, and laboratory and empty offices on a university campus. Five interviews were completed over the

phone. All participants indicated that the interview location was comfortable and acceptable. When meeting with the participant in a public location we positioned ourselves in an area that was free from loud distractions to ensure a comfortable conversation and to ensure the audio was clear. Informed consent was required to participate in the interviews. See appendix E. The participants' perceptions of the clinical rotation served as the primary source of data. Answers to the demographic questions served as a secondary source of data by providing perspective to the researcher.

Interviews lasted from 30 minutes to 60 minutes with the bulk of the interviews lasted closer to 60 minutes. An interview guide specific to the participant population was used to stimulate conversation around the research questions. No participant seemed rushed to complete the interviews. All interviews were scheduled around the participant's available time. Interviews were collected over an 8-month period starting in the spring of 2013 and ending in the summer of 2013.

Participant statements were tape recorded to maintain a record of the rich data captured during the interviews. Following each interview the recorded data were transcribed to a textual electronic form. The researcher also took notes during the interviews to ensure as much data is captured as possible. The researcher's notes were compared to the transcribed interviews to clarify any participant statements. Once all interviews were transcribed the researcher began the data analysis process.

Data Analysis

Phenomenological analysis of data is unique in that there is an interest in discovery versus a focus on content analysis (van Manen, 1990). "Phenomenological

analysis seeks to grasp and elucidate the meaning, structure, and essence of the lived experience of a phenomenon for a person or a group of people” (Patton, 2002, p. 482). The traditional qualitative avenues are navigated during data analysis, such as preparing and organizing the data; however, phenomenology deviates somewhat from coding of data.

Phenomenologists often work with interview transcripts, but they are careful, often dubious, about condensing this material. They do not, for example, use coding, but assume that through continued readings of the source material and through vigilance over one’s presuppositions, one can reach the ‘*Lebenswelt*’ of the informant, capturing the ‘*essence*’ of an account—what is constant is a person’s life across its manifold variations. This approach does not lead to laws, but rather to a ‘practical understanding’ of meanings and actions (Miles and Huberman, 1994, p. 8).

To make sense of the data I used a modified version of Stevick-Colaizzi-Keen method. The modification, endorsed by Creswell (2013) and Moustakas (1994), is explained below. First, I described my personal experiences with the phenomenon. “This is an attempt to set aside the researcher’s personal experiences (which cannot be done entirely) so that focus can be directed to the participants in the study” (Creswell, 2013, p. 193). Second, a cumulative list of all significant statements was generated from the interview data. The listing of data statements is termed horizontalization—treating each statement with equal significance—and allows the researcher to search for nonrepetitive statements (Creswell, 2013). Third, I grouped the significant statements into meaning units or themes (Creswell, 2013). The second and third steps are not included in the text below.

The second and third steps were completed using word processing software, printed pages, sticky notes, highlighting, etc. to help organize the interview data and discover the themes. Fourth, I wrote the textural description of the experience and included exact examples of participant statements (Creswell, 2013). Participant statements are included as part of the textural description to provide greater meaning and association to the description and the participants. Fifth, I wrote the structural description based on the participant interview data. Creswell describes this as "...how the experience happened" (p. 194). Structural description requires that "...the inquirer reflects on the setting and context in which the phenomenon was experienced" (Creswell, 2013, p. 194). Lastly, I wrote a composite description of the phenomenon. This description incorporates the textural and the structural components and forms the "essence" of the phenomenon (Creswell, 2013). Phenomenological analysis allows the reflections from the researcher and from the participant to be combined into the final understanding of the topic (Sadala and Adorno, 2002). Analyzing the participant interviews using the above steps provided the essence of the participants' perspectives on the neonatal and pediatric clinical rotation. Therefore, I was able to answer my research questions and achieved the purpose of this study.

Trustworthiness

What is the truth-value of the findings? Trustworthiness, the qualitative equivalent to internal validity in the quantitative realm, has one basic issue. "How can an inquirer persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to..." (Lincoln and Guba, 1985, p. 290) The researcher

maintained trustworthiness from the beginning of data collection by recording and immediately transcribing interview statements to ensure the data were safely located in audio and written form. The researcher also generated notes during the interviews and compared the notes to the recorded statements. Member checks with the participants occurred once the data were transcribed and categorized according to dominant statements. Participants were presented a copy of the transcript with the significant statements highlighted. This type of member checking ensured the researcher's interpretations of interview statements were consistent with the participant's intention. Other components associated with trustworthiness include: transferability, dependability, confirmability and triangulation (Guba, 1981).

Transferability

Transferability, the equivalent of external validity, requires a great deal of knowledge about the contexts of the study (Guba, 1981). The phrase "thick description" is used when discussing transferability or the generalizability of qualitative study findings (Guba, 1981). "If the thick descriptions demonstrate an essential similarity between two contexts, then it is reasonable to suppose that tentative findings of Context A are also likely to hold in Context B (although, to be safe, an empirical test of that presumption should be made)" (Guba, 1981, p. 81). It can be somewhat challenging to expect full transferability with qualitative study findings. However, in designing the interview guide, the researcher developed questions and prompt statements with the intention to gather as much data as possible. This will ensure that if the study were repeated, the findings might be similar and somewhat generalizable. The researcher completed in-depth interviews of

participants who directly experienced neonatal and pediatric clinical rotations. Using an interview guide these participants provided the “thick descriptions” necessary for the transferability of research findings from one context to another.

Dependability and Confirmability

As we stand on the shoulders of previous researchers we rely on the methods they implemented. Dependability is important during qualitative inquiry because it provides a measure of assurance that if the study were repeated, using the same methods and participants, the results will be the same (Shenton, 2004). As a way to maintain dependability, I have reported all methodology procedures in the greatest detail possible. This creates the audit trail suggested by Lincoln and Guba (1985). In an effort to maintain Confirmability of the findings, I remained aware of personal bias and assumptions throughout the study. As the Director of Clinical Education and a faculty member in the Department of Respiratory Care, there are certain beliefs regarding clinical education that have developed over time. These thoughts are pertinent to a phenomenological study but I tried to minimize the influence of my background on the participants’ statements.

Triangulation

Triangulation is the use of multiple sources and types of evidence to shed light on a theme or opinion (Creswell, 2013). It is a way for researchers to achieve in-depth understanding of the phenomenon (Denzin and Lincoln, 2011). All data and the subsequent themes that developed during and following the interviews were compared and analyzed against the available literature. In addition, perspectives of students,

directors of clinical education, and clinical instructors were compared and any identified differences that emerged were shared as part of the report of data analysis.

Institutional Review Board

This study received Texas State Institutional Review Board approval prior to recruiting any participants and gathering any data. The IRB approval number was included on the consent form to reassure participants of the oversight provided by Texas State. All participants were made aware that the interviews were part of a research project, that IRB approval was granted to conduct the research and the IRB points of contact were provided in the event they were needed.

Philosophical Assumptions

At times, hidden within our research plan and even our own consciousness are the philosophical assumptions that influence research practice. These philosophical assumptions are views we hold based on previous experiences and influence us when conducting research. The articles we read, the journals we publish in, our faculty advisors, and our colleagues will influence our philosophical worldview (Creswell, 2009). Creswell (2013) states, "...philosophical assumptions are embedded within interpretative frameworks that qualitative researchers use when they conduct a study" (p. 22).

My roles as Director of Clinical Education, as a faculty member in the Department of Respiratory Care and as a clinical teacher have shaped my beliefs related to students learning in the clinical environment. I believe there are multiple ways to

conduct research and collect data. A qualitative methodology provided rich participant data that allowed me to address my research questions. This research strategy also offered the greatest benefit to my roles in the Department of Respiratory Care. My philosophical assumptions and interpretative framework are most closely associated with constructivism. I prefer the research endeavors that have a translational value from the *lab to the bed* and vice versa. I believe my philosophical worldview guided me in a positive way toward answering my research questions. I also hold and have expressed assumptions in this document regarding the potential beneficial nature of clinical experiences for providing a context for situated learning of emerging professionals.

Summary

This section described the proposed methodology to answer the study's research questions and address the study's purpose. The study used a phenomenological approach involving participant interviews to gather data as it relates to neonatal and pediatric clinical education. A semi-structured interview guide was developed to increase the likelihood of generating data that would answer the research questions. Once data were gathered a system of analysis, supported by Creswell (2013), was used to explain the experiences of the participants. Briefly, I first describe my personal experiences with the phenomenon. Second, I searched the data for significant statements and made a list of the non-repetitive statements. Third, the statements were grouped into themes. Fourth, I wrote a textural description of the experience. Fifth, I wrote a structural description of the statements. Lastly, I wrote a composite description of the phenomenon.

I recruited fourteen individuals to participate in the interviews with six representing associate degree programs and eight representing bachelor degree programs. Qualitative research studies must follow strict guidelines to ensure the trustworthiness of the findings. From the moment institutional review board approval was granted I conducted every aspect of this study in accordance with the transferability, dependability, confirmability, and triangulation standards addressed in this section. My philosophical assumptions on clinical education and this topic emerged during the study. These assumptions informed and did not unduly interfere with the phenomenon under study.

CHAPTER IV

FINDINGS OF THE STUDY, DESCRIPTION OF THE PHENOMENON AND BRIEF DISCUSSION

The purpose of this study was to determine the limitations and strengths of neonatal and pediatric critical care clinical rotations to adequately prepare RC students. Through qualitative inquiry using a phenomenological research approach, this study investigated the perceptions held by students, directors of clinical education, and clinical instructors toward the neonatal and pediatric critical care clinical rotation. “The research data, that is, the recordings and the transcriptions, are approached with an openness to whatever meanings emerged...It means suspending (bracketing) as much as possible the researcher's meanings and interpretations and entering into the world of the unique individual who was interviewed.” (Hycner, 1985, pp280). Phenomenology is concerned with understanding a phenomenon rather than explaining it (Sadala, 2002, p. 289). I have included a large number of participant comments in the sections below. This was an attempt to preserve the participants’ perceptions of the rotation. The purpose of this research project was to gather information on the neonatal and pediatric clinical rotation. The statements provide a picture of the perceptions held by the participants for the neonatal and pediatric rotation. The purpose of the project was not to compare the neonatal experience to the pediatric experience, although, some participants took the interviews in that direction. Also, some participants made comments that traveled beyond the scope and interest of this research. In an effort to encourage open dialogue I didn’t

discourage any participant comments but did try to keep them focused by using an interview guide.

Research Questions (Restated)

Below is a restatement of my research questions.

1. What limitations and strengths do respiratory care students believe exist for the neonatal and pediatric critical care clinical rotation?
2. What limitations and strengths do directors of clinical education believe exist for the neonatal and pediatric critical care clinical rotation?
3. What limitations and strengths do clinical instructors believe exist for the neonatal and pediatric critical care clinical rotation?

Personal Experiences of the Researcher

I completed the respiratory care program at Texas State (at the time called Southwest Texas State University) in 1998. I have been a respiratory therapist since 1998 and worked concurrently in several hospitals while teaching at Texas State. As a respiratory therapist I have worked in multiple areas of the hospital (non-critical care, adult critical care, pediatric critical care and neonatal care). I have also experienced these patient care areas in multiple hospitals. My teaching career started in 1999 as a clinical instructor for the Texas State program. I accepted a full-time Assistant Professor position in 2002 and accepted the Director of Clinical Education position in 2005.

My neonatal and pediatric clinical rotation as a respiratory care student involved a few days in the neonatal intensive care unit with exposure to the environment, to the

staff, and to the respiratory care procedures and equipment. The exposure consisted of more observation of unit activities versus direct patient care. I did not have an opportunity to care for any pediatric patients during my time as a respiratory care student because of the limited pediatric opportunities within the Austin area. As a practicing respiratory therapist I oriented new staff to the adult, pediatric and neonatal areas as part of my roles and responsibilities. As director of clinical education I made an effort to increase the number of clinical days in the neonatal and pediatric areas. I started with a couple of days and progressed to four to eight days in each area. New neonatal and pediatric hospitals were added to our clinical site rotations. Although the number of days in the hospitals increased the patient care experiences proved more difficult to control. Students would occasionally report, and continue to report, limited patient care experiences during their neonatal and pediatric rotation. Because we offer clinical rotations in different cities and at multiple sites our students are exposed to different neonatal and pediatric experiences.

My personal views on the neonatal and pediatric rotation as the director of clinical education are that the experiences are valuable but inconsistent for the students. The neonatal and pediatric units must accept fewer student numbers than traditional adult clinical rotations thus limiting time available to the students. There is apprehension among some staff to allow complete student involvement. The use of clinical preceptors versus clinical instructors (with a direct association to the educational program) may hinder student learning. However, exposures to neonatal and pediatric patients are more important than replacement with another adult experience. Exposures to neonatal and

pediatric patients will at least provide a glimpse of what to expect upon graduation and employment as a therapist.

My personal description, or epoche, was set-aside at the beginning of the study as a way to suspend my personal judgments on the data. This epoch was “a means to position myself, recognizing that I could not completely remove myself from the situation” (Creswell, 2013, pg. 273). By bracketing my personal experiences I hoped to get a “fresh perspective toward the phenomenon” as experienced by the students, clinical instructors and directors of clinical education.

Student Perceptions

The textural themes uncovered from the student interviews consisted of *patient interaction, expectations of the rotation, clinical instructor actions, and treatment strategy/environment*. Due to the number of student participants and the amount of narrative included, I have added a table at the end of each theme segment to summarize the statements.

Patient interaction. Participating in patient care activities is the leading objective for clinical rotations. The clinical environment serves as a natural place for students to practice procedures that were introduced in the classroom and laboratory settings. The importance of and opportunity for patient interaction was a dominant theme expressed by all of the student participants during the interviews. Students expressed an interest in physically completing respiratory care procedures as well as observing routine and “exciting” medical procedures. There was negative regard for a clinical experience that provided very little “interaction/entertainment.” In speaking about the strengths of the

experience Campbell said, “I thought the amount of time we spent actually touching, you know, being a part of the care was definitely the strength of it. Most of our day was spent helping patients...It was very busy and pretty exciting.” Addison made similar remarks when asked to describe the strengths of the neonatal and pediatric rotation. Addison stated, “I actually got to do a whole lot of hands-on and a lot of equipment.” Mel made positive comments about the pediatric experience saying, “With PICU I was with the educator and he went through a lot of stuff with me...I had a lot of patient interaction.” Parker’s comments demonstrated the factors that likely impact the experience. The comments emphasize the importance of preparation prior to the rotation and the site selection for clinical rotations.

I felt that the number of patients that you got to see, the level of care that you are allowed to help them, if you’re confident, based on the report, and the impression that you give your clinical instructor, and what you are able to do hands-on was pretty good overall. I felt that it was more so on the pediatric side than the neonatal side, but that wasn't something that I considered a negative.

Later in the interview Parker provided a theory for why the pediatric experience offered greater hands-on opportunities. Sage reported very few limitations when participating in patient care activities.

As far as interaction they let me do breathing treatments, blow-by, CPT and they even let me do surfactant once. That was good because I wasn’t thinking they would let me do surfactant therapy. They were really good about letting me do everything and letting me get a lot of hands-on.

Negative experiences existed when the student was not actively involved. Mel stated, “When I went to the NICU there was hardly anybody or anything in there. So I didn’t get to experience a lot.” Bailey expressed quite a bit of frustration with the limited involvement in patient care while in the NICU.

The first day I don’t think I even did anything. I pretty much observed... But as the days went on, I still didn’t do anything. There wasn’t that much to do or participate in. I think I learn the best way by doing. So not having that [participation] I just felt kind of like I was just kind of doing my thing and going home. I didn’t really feel like I was learning a lot.

London made similar comments about the neonatal intensive care unit experience and it clearly shaped the view of the rotation.

I had a couple of NICU rotations where I didn’t get to do as much hands-on, I guess maybe because they’re so small and fragile. And me getting to go into NICU I feel like it’s actually a disservice because I didn’t get to get a lot of hands-on time with them.

Although Sage reported an overall positive experience when considering hands-on activities, there was one regret with the neonatal experience in particular.

I got a lot of practice with NICU therapy but the thing I wish I would have gotten to do a lot more of was to participate more in deliveries. I wasn’t allowed to do anything. And I don’t know if it was that hospital policy or what, but I got to go in on several deliveries a day where I didn’t get to do anything other than just to stare. I thought it would have been nice to have had more hands on and have done

stimulating or getting APGAR scores other than just sit back and watching every time. I thought that was the main weakness.

Deliveries can be an exciting moment for students and a critical time for the newborn.

Participating in that activity can be a huge accomplishment for a student.

Parker provided an explanation for the challenges facing students when caring for certain patients.

People just, rightly so, tend to be a little bit more protective of the most fragile patients, which are the neonatal patients. Sometimes I felt that there's definitely more of a hands-on opportunity with the pediatric ICU rotations, but it wasn't completely at the expense of any kind of inappropriate side on the neonatal side.

This certainly could explain why several participants reported being able to do more with the pediatric patients than the neonatal patients. See table 4.1 for additional information on this theme.

Table 5. Relevant Points and Additional Information Related to the Patient Interaction Theme

Patient Interaction Theme		
	Relevant excerpts from the quotes included above (if available)	Additional participant quotes not included in narrative above
Addison	Lots of hands-on	"I got to basically do everything."
Bailey	Wasn't much to do or participate in Not learning a lot	"There wasn't enough to do." "Personally, just not enough going on."

Table 5-Continued. Relevant Points and Additional Information Related to the Patient Interaction Theme		
Campbell	Being a part of care [<i>positive experience</i>] Most of day spent helping patients	“The overall strength was the patient contact.” “You’re right there getting to see it.”
Dakota	N/A	“I feel like touching the babies and assessing them and changing their prongs and nasal CPAP, I mean, pretty much doing everything. I feel like that was the strong point.”
Harley	N/A	“When we actually got to do things it made more sense.” “I mean some of the instructors that we had would explain it but until we actually got in there, you could finally say ok, I know what I need to work on.”
Jordan	N/A	“I think I learned more, obviously, being in there hands on than I did in the lecture class.”
London	Didn’t get a lot of hands-on	“If you don’t ask they’ll [clinical instructors] just do everything themselves.”
Mel	Patient interaction [<i>negative experience</i>] Hardly anything in there [<i>negative experience</i>]	PICU: “I feel really confident because I had a lot of patient interaction.” NICU: “There were a lot of things that I never got my hands on or really experienced.”

Table 5-Continued. Relevant Points and Additional Information Related to the Patient Interaction Theme		
Parker	Lots of patients Level of care allowed [<i>positive experience</i>]	“I felt that it [patient contact] was more so on the pediatric side than the neonatal side, but that wasn’t something I considered a negative.”
Sage	Letting me do everything [<i>positive experience</i>] Didn’t participate in deliveries [<i>negative experience</i>]	“The first couple of days they [clinical instructors] kind of watched me but after that they kind of let me go off and do everything on my own.”

Expectations of the rotation. It’s common practice for directors of clinical education to provide insight to the students regarding the function of a unit or patient area prior to the start of the rotation. The insight can set in motion an expectation of the clinical rotation experience for the students. The idea is for the student to begin preparatory activities – through studying, review, laboratory practice – that will increase comfort, knowledge, skill and potentially improve the outcomes of the clinical rotation. Also, most programs have a neonatal and pediatric didactic course prior to the clinical rotation. Consistent with this statement, all of the student participants completed a didactic course prior to the rotation. Based on course material covered, DCE statements and classmate conversations the students will formulate a scenario of what to expect before entering a hospital or unit. Can student expectations shape the clinical experience? Parker provided the following thoughts on expectations for clinical experiences,

I think to go into a clinical situation expecting a mirror of what you have seen in a textbook or to a national standard word for word exactly as it is shown is a little naive. What I find is that with survey courses or core work to prepare you for that

- it gives you the ability to understand the lingo and critical skills that you need to be able to think about it, and you will encounter the same subject matter, but not necessarily delivered in the same way.

At times the student expectations can be starkly different from what actually happens during the rotation. Harley discussed the expectations prior to the rotation and the final assessment at the end.

I didn't think I was going to like the NICU rotation just because of what I had heard before with people saying that mostly they're different depending on which hospital it is you might not get to do anything. It ended up being my favorite rotation thus far. There were a lot of things that I felt like, little things that I received from that rotation, that I felt like I didn't really get in the other rotations. Just really well-rounded care being that they're babies. So we got to pretty much get a picture of what we should be doing.

Jordan entered the rotation with disillusionment toward the hospital environment.

However, after experiencing the neonatal environment Jordan's perspective changed.

Jordan viewed the hospital, specifically the NICU, more favorably.

Before this I thought I didn't want to have anything to do with the hospital. I'm not going to do floors. I'm not very interested in the adult ICU. Just not the place for me...But after my NICU rotation...it's definitely changed my perception a little bit. I liked getting up and going everyday and I couldn't say that about any of the other rotations. It was more, *oh I have to*. But this one I was excited to go to learn. I really like babies too. So it definitely changed my future plans.

Dakota expressed a couple of thoughts on the expectations for the neonatal environment.

Well my initial perception of the NICU I thought we weren't gonna have a lot of hands-on, assessments you know with the babies and touching the patients a lot, from what was initially told and what I thought about it. But after going into the NICU I had a great experience.

All respiratory care programs have a greater focus on adult care versus neonatal and pediatric care. The number of adult clinical days far out number the clinical days in the neonatal and pediatric areas. The reason is based on the availability of sites. The numbers of adult care areas outnumber the neonatal and pediatric areas. When asked about weaknesses of the neonatal and pediatric rotation Addison suggested the amount of clinical time dedicated to the neonatal and pediatric areas could be an issue.

I think it could maybe be longer. It depends on what you think your whole purpose of the rotation is. If it's just to expose you then I think it's the right length. If it's to give you experience then I think it needs to be quite a bit longer.

Bailey experienced very little activity when rotating through the NICU environment and perceived the experience and the site negatively. Other classmates influenced Bailey's expectations before the experience and views formulated about entering the NICU environment. "I mean it was really good experience just to see what a NICU is like...From talking with other classmates they had so much more to do and I was a little bit jealous." It's possible that Bailey's perception for the NICU would be different if the experience matched the other classmates. How much of Bailey's jealousy influenced overall mood and demeanor during the rotation? Students routinely share their experiences during classroom, laboratory and clinical activities with classmates. Hearing that some students are receiving a "better" experience can be frustrating for some

students. Expectations build as the rotation progresses. Some students expect to do more as they experience more. Sage commented on the participation level during newborn deliveries. Sage said, “What I wish I would have got to do a lot more of was to participate more in deliveries.” Her expectation for more hands-on experience in that particular environment created disappointment in the rotation. What impact does it have on her future plans for employment? Obviously some deliveries are more critical than a student’s level of expertise. Participation in all deliveries may be unrealistic. However, in Sage’s case she felt comfortable with the level of care that was provided to the newborn. Table 4.2 provides a summary and additional information related to the expectations theme.

Table 6. Relevant Points and Additional Information Related to the Expectations Theme

Expectations Theme		
	Relevant points from the quotes included above (if available)	Additional quotes not included in narrative above (if available)
Addison	N/A	I was expecting some [hands-on] but not as much as I got.
Bailey	Heard other classmates did more	“I was hoping to get in there and it would be hands-on but it wasn’t really like that.”
Campbell	N/A	“When I walked in [to the unit] she was like ok get in there get started and I was like uhh. I felt pretty uncomfortable the first couple of days.”
Dakota	Wasn’t expecting a lot of hands-on	N/A
Harley	Didn’t expect to like the environment	N/A

Table 6-Continued. Relevant Points and Additional Information Related to the Expectations Theme		
Jordan	Didn't want anything to do with the hospital	N/A
London	N/A	N/A
Mel	N/A	"They [clinical instructor] kind of force us out of our comfort zone and say hey, go put that together.
Parker	Realistic expectations	N/A
Sage	What I wish I would have got to do a lot more of was to participate more in deliveries	N/A

Clinical Instructor Factors. Clinical instructors are incredibly valuable to respiratory care programs because they serve as an extension to the faculty and they lead the students in professional practice. Recruiting, retaining, matching the clinical instructor to the students and the hospital area has become an art and a science. Sometimes the person with the greatest number of years of experience isn't always the best instructor. There were several clinical instructor factors that influenced the students' perceptions. All of the student participants provided comments on the clinical instructor experience in a positive or negative manner. The interest in being a clinical instructor, the knowledge or skill level of the clinical instructor, the clinical instructor's trust in the student all played a role in the student's perception of the experience. Multiple participants described the respect they developed for the clinical instructor's patient care and teaching abilities. London said,

I feel the RTs [respiratory therapists] really know what they're doing. They explain pretty much everything, even if we've done it before they'll re-explain it. And that's what I like because as far as NICU and PICU I feel like we don't have as many days as our adults [rotations]. So I like to get as much information as I can even if it is learning or hearing it over again.

Jordan experienced both sides of the trust theme with the neonatal clinical instructors. Some clinical instructors are open to allow participation and active involvement; however, others are more hesitant to allow student activity. Jordan said,

It definitely depended on the RT. There were 2 RTs there that were very, I think they kind of felt us out the first day to see how we did. If we enjoyed it. And then the second they had us they were like, 'ok I'm going to stand behind you and I'm going to be there to walk you through it but I'm going to let you do it.' And then we had another RT that was like, 'no no no I'm going to do and you can just stand there.'

This experience really influenced Jordan. The trust instilled by the clinical instructor gave Jordan confidence that resulted in a positive interpretation of the rotation.

Dakota expressed views of the clinical instructor and the nursing staff for the neonatal experience.

Like I said I think Jill [clinical instructor] did a good job knowing where we were educational wise and clinical wise. You know, for not having her for previous rotations she trusted us with a lot of setting up their equipment and touching the babies. And really just jumped in there. Didn't feel pressured at all. Nurses were great too. Kind of followed Jill's lead. She had a really good relationship with the

other employees there. They trusted her. She was vouching for us and was able to let us do all of the stuff that we did.

Addison experienced two clinical instructors when rotating through the NICU. One of the instructors had several years of clinical teaching experience compared to the second instructor. This difference in experience was noticed by Addison and was discussed during the interview.

Well there's a new clinical instructor in there who doesn't feel real comfortable with the position yet. And I think that's just gonna take some time. And that's probably the only weakness I see with that rotation... I think there were a couple of negative blips from a couple of people, but they were nurses. And I think that the way the clinical instructor handles that is the key to how good that whole resolution is. For example, there was one patient that we were taking a long time to re-tape and the nurse started to come over and say something and Bobby just looked at her and she went away. On the other hand, she came up and said something to William and because he's new, he didn't quite know how to handle that. He's like 'oh we were taking a long time.' Yeah well we were taking a long time, you have a student. Ok, so it probably is going to take longer than they are used to it taking. I think that's the most difficult thing for the instructor because you are working with such little babies. I mean some of them are so small. So I think that's probably the hardest thing for them. I think Bobby does a super good job at it. He let me try doing in-line suctioning and I was having a hard time with it... But he didn't stop me after the first time. He let me try and then because I was having a hard time, we went and practiced on a doll. So I thought that was

really great. I think that probably because he's been doing in longer he's willing to let you try and he's willing to step in if he sees that you can't do something as well.

There is no way to avoid having a therapist with very little teaching experience.

However, proper orientation, role-playing, scenario sharing can guide clinical instructor actions and potentially prevent some of the experiences described by Addison.

Campbell experienced a very supportive and encouraging clinical instructor in the NICU.

In addition the instructor was well respected by the unit staff.

I felt like she [clinical instructor] put 100% trust in us. She was like, 'ok you just do it and I am gonna stand here and watch and make sure you don't mess up. But I know you guys can do it.' The nurses I would say probably 60 or 70% of them were just very much 'alright, you guys can come with me, do it.' You know, just very helpful. There were a few that were like, 'well, they're students, I don't know.' But none of them were mean about it. They were all very trusting for the fact that it was our first rotation. You know, they don't know our background. It was an excellent environment. Everybody was really professional. I mean some of the nurses were a little more protective and so they would ask a lot of questions. Which I think just keeps us on our toes. But we went over all of the equipment thoroughly. Every therapist that we ever came across was always asking us questions. You know, 'would you like to come with us to see this and do you have any questions?' You know, 'how do you like the rotation?' Everybody was very professional and very interested that we learned what they were doing which I

thought was nice. Sometimes it's not always the case that everyone is interested but I felt like in the NICU every therapist we came across was very helpful.

Sage's experience with the neonatal and pediatric clinical instructors was positive overall.

The trust level was really good even the nurses were really helpful when they saw me coming around. So I felt like I got a lot of trust with the nurses and the RTs... There wasn't a lot of looking over my shoulder. I think it was a really good learning environment even though it was high-risk babies and it was kind of stressful. I didn't feel like I was pressured by anybody. I was never put on the spot or anything like that. Everyone was really helpful with me if I ever had a question to ask. And if they didn't know the answer they would find out for me.

Mel's experience demonstrates that clinical instructors can inhibit participation by their actions. Mel described the NICU experience by saying, "When I did get to go in with a patient they [the staff] did everything and didn't really explain what they were doing a lot." Mel went on to compare the NICU and PICU clinical instructor experience.

My experiences in all of the PICU's I had stronger therapists that could answer the questions. I just seemed to get a lot more out of the PICU rotations than the NICU. I don't know if it's time or just the therapists that were willing to teach more.

From Harley's interview there was a sense that the rotation built a lot of confidence in caring for sick infants. This confidence created a feeling of excitement about attending the clinical assignment and experiencing the day's activities. Harley said,

It just felt like every single day there was going to be something new. Or something that just clicked. Or you know the more that we were there the more

we felt like we could take care of the patient. I felt like the majority of the instructors that were there were confident that we knew how to do certain things after they taught it to us and saw us do it many times. They wanted us to get experience and so because they wanted us to get more experience the more we wanted to be there.

Bailey commented on the efforts by the clinical instructor but the difficulties of learning given the rotation nuances.

I didn't really feel like I was learning a lot. The RTs would try to show me equipment and they would show me the transport bed and the vents hooked up and everything. But it's not the same when you don't have a kid [patient]. I can only retain so much if I'm not really seeing it in action.

Clinical instructors appeared to serve as a significant strength and potential limitation of neonatal and pediatric clinical rotations. The student participants felt like the clinical instructors controlled their patient interaction and impacted their rotation. Table 4.3 offers a summary of the student participant statements associated with the clinical instructor theme.

Table 7. Relevant Points and Additional Information Related to the Clinical Instructor Theme

Clinical Instructor Theme		
	Relevant points from the quotes included above (if available)	Additional quotes not included in narrative above (if available)
Addison	Trust is the hardest thing for them Provided repeated opportunities	N/A

Table 7-Continued. Relevant Points and Additional Information Related to the Clinical Instructor Theme		
Bailey	Instructors made an effort to teach without patient present	“With the nurses it was like one on one or two on one so if I had any questions I could ask them and there were a few that weren’t so helpful but others were really helpful. And they would explain things to me.”
Campbell	Interested in student learning Very trusting in student involvement	“Every therapist that we ever came across was always asking us questions. You know, ‘would you like to come with us to see this’, and ‘do you have any questions?’ You know, ‘how do you like the rotation?’ Everybody was very professional and very interested that we learned what they were doing.”
Dakota	Complete clinical instructor trust	“You could tell that the people respected our instructor. She got us in to touch the babies and it was really nice.” “Just the overall team, the quality of the team. Everybody was open and let us feel comfortable in getting a proper rotation.”
Harley	Instructors’ confidence impacted learning	“There were times I felt like some people weren’t comfortable, I guess, with students being there. There weren’t a lot of people but I felt like we learned a lot more when we were actually able to be hands on. I felt like with them being confident in us I felt like we felt more confident.”
Jordan	Student experience depended on the instructor	N/A

Table 7-Continued. Relevant Points and Additional Information Related to the Clinical Instructor Theme		
London	They explain everything They know what they're doing	"If you don't ask they'll [clinical instructors] just do everything themselves."
Mel	Instructors did all the procedures	"If you do something that they're not comfortable with they're not going to let you touch anybody."
Parker	N/A	"Usually, if something was limited, there was a good reason for it and it was always from a patient care perspective, not like a personal thing with the therapist you were with or the way they were structuring the clinical education there."
Sage	Good trust from all the staff No pressure from the instructors	N/A

Treatment Strategy/Environment. Areas within a hospital can offer different experiences for the students. For example, the neonatal and pediatric areas may foster a patient care approach that involves multiple medical specialties, e.g. physicians, nurses, and allied health, participating as a group in the treatment plan. Whereas in the adult critical care areas everyone may follow the guidance of a singular person, e.g. the critical care physician.

Mel described a positive experience associated with the team example when entering the PICU.

On the PICU side I really like that the physicians round outside of the room. So you really know what patient they're talking about. And everybody is there so you get to hear a lot of the sides that respiratory doesn't get to, like nutrition and

pharmacy. So you get a more rounded perception of what's going on with the patient.

Mel's enthusiasm associated with experiencing a team approach to care is not uncommon. Students tend to be unfamiliar with the scope of practice of other healthcare providers. The neonatal and pediatric rotation offered a glimpse into these other specialties and the importance of a team-based approach to care.

Harley also reported a positive experience with the team approach. Harley's NICU experience involved the use of *cluster care* to guide the actions of the healthcare providers in caring for the infant. Cluster care means healthcare providers schedule activities at the same time to allow more rest time for the infant in between the scheduled care.

They do a lot of cluster care so it was more like teamwork effort and everybody on the same page to try to make sure the baby gets better. And I enjoyed that part of it...it gave you that overall picture of what you should be doing, like the standard of care we should be giving. A lot of times I guess in the adult ICU there are so many things that you had to do, I felt like I couldn't focus on everything. But it seemed to all come together in the NICU.

Jordan's experience demonstrated how communication was a part of the care approach during the neonatal and pediatric rotation.

As a team the nurses, RTs and even the doctors were all very, everybody knew what was going on...It was okay I'm going to go tell the nurse now or the nurse did this and they're going to come tell me. And I like that a lot. It just seemed a

lot more organized and patient care was more focused. In the adult ICU, it just seemed kind of all over the place and disorganized.

Parker described the environment as one that provided camaraderie and optimism.

But I found a particular mind-set whether it was a sense of optimism or sort of a greater camaraderie that I didn't find as consistent on the adult population and that seemed to overall paint a more positive picture in my mind, kind of, that whole side of the Respiratory Care nature and that may be one of the reasons why I actually feel like I'm moving towards it. I have nothing against the adult side, but subjectively I had a much more positive experience based on just who you are working with, which is a big part of that practice and then within the actual scope of the rotation, again also positive.

Other participants echoed this “team” atmosphere and associated it with a positive perception or experience. The prevailing message in current medical care in the United States pushes the benefits of team-based care within all critical care areas of the hospital. A team approach can provide shorter hospital stays and better outcomes. Since neonatal and pediatric patients are viewed as the “most fragile” of patients the “team” approach is believed to be critical (Horbar, 1999). Dakota was impressed with the actions of the staff and the experience offered within the neonatal environment.

They do things the right way. There's a sense of professionalism I got from the team members in the NICU with the nurses and the RTs, the doctors; everybody was really professional. Worked well together. I saw a difference between the NICU and just the adult floor RTs. I guess they're more dedicated, they're more involved with report; it's just more detailed oriented, very precise. I liked that

about the NICU... I guess I was expecting this stigma of ‘oh this is babies and it’s critical’, which it is, but the staff was very welcoming. Everybody was real nice, warm-hearted. It didn’t really have a tense care unit stigma on it. I guess with the babies too. They had the toys and the blankets. It’s a mix up from the adult ICU where everything is trauma, the smells and the wonderful ambiance of the adult ICU sometimes. [*Laughs*] The NICU is very clean and sterile...you have to soap in, foam in and foam out... It was clean. It was sterile. I didn’t think it was going to be like that.

Campbell discusses the strategy he experienced during the rotation.

“Their protocol is to change the prongs to mask or mask to prongs every 12 hours, so we did that once a shift. We did circuit changes pretty much every day. So, we were changing at least 2 or 3 circuits a day. We were suctioning. We were always there for the assessment, which I thought was very cool. Just getting together with the nurses trying to coordinate everything.”

Rotating students through a site that uses protocols may be the preferred strategy for DCEs when setting up rotations. It would seem the students could practice the protocol items prior to the rotation thus presenting with less apprehension and unfamiliarity with the procedures. This may place the clinical instructor at ease when deciding if the student(s) are capable of participating in the care plan. Table 4.4 provides a summary and additional information relevant to the treatment strategy/environment theme.

Table 8. Relevant Points and Additional Information Related to the Treatment Strategy/Environment Theme

Treatment Strategy/Environment Theme		
	Relevant points from the quotes included above (if available)	Additional quotes not included in narrative above (If available)
Addison	N/A	N/A
Bailey	N/A	N/A
Campbell	Use of protocol Scheduled procedures/care	N/A
Dakota	Sense of professionalism Staff worked well together The staff is more dedicated	“You worked in teams too. The nurse would be on one side and the RT is on the other side changing the prongs or whatever it was. I liked the teamwork. We were never touching the baby by ourselves.”
Harley	Cluster care Teamwork effort Focused on the patient	N/A
Jordan	Communication between providers Organized and focused patient care	N/A
London	N/A	“I think it [patient workload] can get overwhelming for some of the RTs. They could use another RT.”
Mel	Physician rounds Exposure to other providers Well-rounded learning	N/A
Parker	Sense of optimism Camaraderie among the staff	N/A
Sage	N/A	“I feel like it was a very open learning environment.”

Structural Description of Student Findings

Students expressed an interest in physically completing respiratory care procedures. There was negative regard for a clinical experience that provided observation only. Involvement in the care of the neonatal and pediatric patient was definitely positive perceived. Expectations can influence student perceptions thus realistic expectations should be shared prior to the start of clinical rotations, especially when the experiences are not similar across the entire class. There is no way to avoid differences in clinical experiences. When using multiple clinical sites the experiences will undoubtedly be different. Using multiple clinical sites also means using multiple clinical instructors with different teaching styles. Clinical instructors maintain an important role in educating students. The students easily pick up on the skill level of the instructor and the trust developed for student to participate during the rotation. Some are open and others are resistant to student participation. The neonatal and pediatric environment is very different compared to the adult clinical environment. Students enjoyed the team-approach to patient care. Its possible the group atmosphere reduces some of the stress and nervousness associated with the critical care environment. Familiarization with other healthcare providers and the services they provide can offer a level of education not encountered during didactic coursework.

Director of Clinical Education Perceptions

Two directors of clinical education were interviewed for this research, one from an associates degree program and one from a bachelors degree program. The director participants were very open to participate and I believe provided candid perceptions of

their neonatal and pediatric experiences. The textural themes uncovered from the director of clinical education interviews consisted of the *clinical environment* and the *role of the clinical instructor*.

Clinical Environment. The DCEs appeared to base their perceptions of the neonatal and pediatric experiences on the realities of the clinical environment in which the students rotated. The environment theme refers to the nuisances of interacting with the unit staff, the number of sites available and the distance traveled to reach the site, and the ability of the students to participate in unit procedures. Although not described as ideal, the neonatal and pediatric areas provided “a good experience” or “met expectations of the region”. Quinn stated,

Depending on the age of the child. So pediatric experience I think they get a pretty adequate pediatric intensive care experience across the board with the more basic things. With the NICU experience I think that they’re getting, depending on the preceptor, depending on the affiliation that you have with your clinical site, you can get a good experience or you can get a totally hands off experience. And we’ve got kind of both here.

Quinn went on to offer some reasons for the strict hands-off approach of some NICUs referencing factors like the critical nature of the babies and the unit staff allowing participation with high-risk patients.

Any neonatal intensive care unit is not going to let their students come in and do the high-risk procedures. Like surfactant administration; some of the other things that you’re dealing with like the acutely ill baby that you need to suction or you need to turn or you need to take the 400 or 500 gramer [newborn’s weight in

grams] and switch them from prone to supine while on the oscillator. They're [nursing and RT staff] not going to let us do that. So, students don't get that exposure until they're not students anymore. So I think some of these kinds of things that students don't get experience with in the NICU and they're not going to get that until they're out in the real world. Having said that a new grad is not going to get that experience either. Right away. It's going to take them time to get that experience. Just because neonatal nurses, neonatal therapists don't let anybody into their territory.

Parker, one of the student participants, made a similar statement about the neonatal and pediatric clinical environment.

Riley addressed the limitations to providing a thorough clinical experience in the neonatal and pediatric environment. Riley mentioned clinical site availability and curriculum challenges hindering the rotation.

I would say that it meets our region's needs. Students at least get introduced to these concepts. So they can pick up further details through OJT [on the job training] if they do choose to go and train somewhere else. We simply don't have enough time...and we don't have the clinical sites to give them the experience either.

Participation in patient care activities is preferred but may not be the actual scenario.

Based on DCE comments there appears to be more observation and sometimes the patient census put considerable constraints on the rotation experience. However, observation of patient care activities appears to be an acceptable standard versus direct patient interaction. Quinn stated,

At these affiliations they get really good exposure. There's nothing that they're just not going to get to see everything that they could possibly see at these particular sites. So they're good sites. It's not like they're stuck in a little 2 or 3 bed NICU not getting an opportunity to see anything going on. So we've got great sites that they're seeing things. It's just that they don't really get the hands-on that they need.

Riley discussed the influence patient availability has on student participation during clinical rotations.

The patient interaction is highly variable of course based on acuity. Even these two strong NICU sites that we have can be up and down. Sometimes I've had students go and spend two consecutive weeks at a NICU site and they come back after the first week and say we didn't have any babies on vents. All I did was maybe set up a bubble CPAP...and then the next week they go back and all of sudden they've got five of them [patients on CPAP], two of them are on an oscillator or something like that. So it's still highly variable. The population is not constantly high. So sometimes it's tough to ensure that the student does get those 36 or 72 hours of opportunity with babies on vents and oscillator. So that's the patient interaction. I think that also kind of hits frequency of interaction. It's hit and miss.

Riley also mentioned travel to and from clinical sites as a factor influencing the student experiences.

As it is now our students are driving, like I said we have ten or twelve sites and only two of them are local. They have to drive anywhere from like an hour to 6 hours one-way to get to the other clinical sites.

This amount of travel is not uncommon for students in clinical programs. Many respiratory care programs have to use clinical sites located in cities other than the home city for the program. Travel distances that Riley speaks of can interfere with student preparation time for other coursework.

Role of the Clinical Instructor. Both directors praised the benefits of having a dedicated person to instruct the students. Whether it is a person being supplied by the respiratory care program or a person identified by the hospital department, having a well-trained person to oversee student activities was the goal. Quinn supported the preceptor strategy as long as the person was sufficiently trained in being a preceptor.

I think that there's a really good reason to use preceptors because I think the students get a little bit more experience with a preceptor being there because that preceptor is normally at the bedside with the patient. They're more well received by the staff therapists or the staff nurses that are there. So the student might get a little bit more experience in that setting. But I don't like just throwing the student into just any preceptor. I think the preceptor needs to be someone that's approved and has gone through preceptor training and knows what we expect of our students.

In addition to using preceptors, Quinn's program also uses program faculty as clinical instructors. Quinn spoke favorably regarding both options when educating students in the clinical environment. Riley describes the importance of their preceptors as:

...invaluable because we're getting someone who works not just in the field at that hospital and has their skills up to date, to the very most cutting edge, we're getting someone who wants to work with students, who likes students, who can help us navigate the orientation process.

Structural Description of Director of Clinical Education Findings

The DCE participants described the neonatal and pediatric sites as meeting expectations. Both DCEs believed there was room for improvement but realistically the amount of time available and the dynamics of the patient care areas were strong factors influencing, and often times limiting the rotation experience. It is unlikely that students will be able to provide care to the very fragile patients. The DCEs recognized that the clinical site might not be able to provide a full complement of care. Clinical simulation was mentioned as an option to providing this type of experience. Clinical simulation would allow completion of some tasks prior to and following a neonatal and pediatric clinical rotation. Both DCEs praised the clinical instructors that were available and believed proper training of the clinical staff was important. With proper training for the clinical instructor role it could be surmised that educational experiences for the students will be positively impacted. Whether it is a person being supplied by the respiratory care program or a person identified by the hospital department, having a well-trained instructor to oversee student activities is the preference by both DCEs.

Clinical Instructor Perceptions

Two clinical instructors were interviewed for this research, one from an associate's degree program and one from a bachelor's degree program. Similar to the DCEs, the instructor participants were very open to participate and I believe provided candid perceptions of their neonatal and pediatric experiences. The textural themes uncovered from the clinical instructor interviews consisted of *patient interaction*, *eagerness to learn*, and *additional development*.

Patient interaction. The clinical instructors recognized the benefit of providing a rotation with consistent patient interaction as well as the experience necessary to work in the critical care environment. However, both participants recognized the difficulties of providing participatory learning activities during clinical rotations in the neonatal and pediatric areas. Nicky described the student experiences based on the hospital for the student rotation.

So the NICU/PICU students have a lot of opportunities for hands-on skills. And they have a lot of variety of patients as far as anomalies and disorders. And of course it's a trauma center. You know they get the pedi trauma there as well. It's a teaching hospital so it's a good team environment. They have a lot of good relationships there as far as what they see between the doctors and the nurses and the RT's.

Nicky went on to discuss the challenges faced by students in the NICU and PICU by saying the "minimal stimulation" in the NICU and the "low census" in the PICU can interfere with patient interaction opportunities. The pediatric environment tends to fluctuate based on changes in the weather. The winter months tends to be a high admit

time for pediatrics because respiratory problems make up the bulk of the patient admissions.

Teagan made the following comments regarding patient interaction during clinical rotations.

Here even now, we allow students to do various procedures. As a whole I feel that we allow our students a good amount of hands-on, also with them going to L&D for deliveries. They go to the OR [operating room] also for deliveries. And of course they don't get to go on transport but we try to get them out there so that they can see the situations and get a feel for if it's something that they would be interested in.

Teagan also mentioned the difficulties in getting hands-on experience in the NICU.

I feel that they're not particularly ready for one on one care. But I do feel that they are ready for some guided experiences with someone standing with them. Part of that too may not be the fault of the student but the working dynamics in NICU tend to be a little bit different from adult critical care.

Desire to Participate. The motivation to participate in clinical activities can greatly influence the clinical instructor's desire to seek out experiences. Students that show an interest and the aptitude appear to have a better chance of hands-on or observation opportunities. The students echoed this theme in the above sections. Nicky discussed how some students are gung-ho while others are completely resistant to certain environments.

Most are eager to learn. In the NICU they're particularly excited to go to deliveries. Even if they are mothers and have their own kids. They're still excited

about going to deliveries. Some are interested but others are not interested at all. They have no desire to work in Peds or NICU. They tell me up front they really don't want to do it.

Teagan also discussed how student actions could influence the neonatal and pediatric experiences.

The ones that come in number one wanting to be there and have the understanding of what's going on, they get a lot more out of it. Because I feel like those types of students they engage the staff by asking questions and wanting to see things. It's just the eagerness that I like to see.

It's possible that respiratory care programs can provide Teagan with the type of student that will be most successful when completing clinical rotations. Through proper preparatory training the student entering the hospital could have greater knowledge of the clinical areas and what to expect.

Development. The participants discussed their views on additional development that would benefit the students during their clinical rotations. Both participants made different suggestions for improving the rotations and educating the students.

Nicky said, "maybe we should be doing a little more simulation with neo's and pedi's before we even let them go in the unit." Teagan said,

I think one of the bigger things that I've seen that I liked is a longer rotation shift in hours. Some are only here for 8 hours and some are here for 12. I like the 12-hour shift better for the students because they have the time to simulate with the staff. And I feel like they get to see a lot more and get a real idea of what it's

going to be like when they get out there and become a part of the work force. I think that 12 hours is better for the students.

Teagan also mentioned the importance of exposing the students to the type of equipment that is available in the clinical site. Teagan said, “it’s always nice if the programs have up to date equipment. You know, stuff that their hospitals already use.”

Structural Description of Clinical Instructor Findings

Both participants recognized the challenges of providing learning activities in the neonatal and pediatric areas. As mentioned by the DCEs, the clinical instructors discussed the dynamics of the neonatal and pediatric areas. Some newborn infants require minimal stimulation and pediatric patient admissions decrease during seasonal time periods. Both scenarios can interfere with patient interaction opportunities. Clinical instructors feed off of student motivation. If the students are eager to learn the clinical instructors are more likely to seek out patient care opportunities. Students that show an interest and the aptitude are certainly preferred by the clinical instructors. The two clinical instructors interviewed mentioned the implementation of certain learning activities prior to the rotation and a longer time spent in the hospital could potentially increase student development during the rotation. Also, it may provide a more experienced and knowledgeable applicant to the hospital after graduation.

Composite Description of the Phenomenon

This description incorporates the textural and the structural components and forms the “essence” of the phenomenon (Creswell, 2013). Phenomenological analysis allows

the reflections from the researcher and from the participant to be combined into the final understanding of the topic (Sadala and Adorno, 2002). The interviews provided the participants' perspectives on the neonatal and pediatric clinical rotation.

Direct patient care was the primary desire for all participants in this study. Students wanted more hands-on involvement. DCEs wanted to provide a clinical rotation that could offer strong clinical experiences to prepare the students for future employment. Clinical instructors wanted to get the students involved in a variety of patient care opportunities. When direct patient care was not possible then clinical observation of patient care was desired. Negative perceptions were almost always present when a student could not provide or observe patient care activities. However, participants recognized the challenges associated with treating patients in the neonatal and pediatric areas. These include staff personalities - i.e. resistant to allow student interaction with their patients - environmental differences - i.e. type of care provided in one location is different than care provided in another - and the time allowed to fully experience the neonatal and pediatric patients - i.e. limited number of clinical sites equals a limited number of clinical days. All three participant groups – students, clinical instructors, DCEs, have a role in determining the “success” of the neonatal and pediatric experience. Students need to be eager to learn. Clinical instructors need to be willing to teach student regardless of the challenges identified above. Directors of Clinical Education need to secure the proper sites and the ideal clinical instructors for the students to be successful. Yet, hospital policies and the number of patient care offerings maintain a strong influence on the type of experience that occurs. Unfortunately this seems to be a huge hurdle to the neonatal and pediatric clinical experiences, specifically for the participants of this study.

But if respiratory care programs are going to claim students are graduating with the necessary skills to enter practice then greater access and participation in these two areas is needed.

The key to legitimate peripherality is access by newcomers to the community of practice and all that membership entails. But though this is essential to the reproduction of any community, it is always problematic at the same time. To become a full member of a community of practice requires access to a wide range of ongoing activity, old-timers, and other members of the community; and to information, resources, and opportunity for participation. (Lave and Wenger, 1991, p. 100)

CHAPTER V

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

FOR FUTURE STUDY

The purpose of this study was to determine the limitations and strengths of neonatal and pediatric critical care clinical rotations to adequately prepare RC students. The clinical environment offers numerous challenges to teaching and learning. There are a number of factors affecting neonatal and pediatric clinical education outcomes. “Therefore, there is a need to assess students' perceptions of the clinical learning environment to facilitate and maximize their field placement” (Chan, 2002, p. 71). In addition to respiratory care students, respiratory care clinical instructors and directors of clinical education have influence in the outcome of clinical rotations. By focusing on three specific populations, 1) respiratory care students 2) respiratory care directors of clinical education, and 3) respiratory care clinical instructors I was able to gather data from individuals directly involved in respiratory care clinical rotations. Although there are other groups that could provide information related to clinical education, e.g. other healthcare providers, department managers, patients, etc., I believe the three groups selected for this project were able to offer the most important information to address the problem identified in chapter one.

Using a phenomenological approach, perceptions of the clinical experience were provided by fourteen participants who are associated with bachelor degree or associate degree respiratory care programs. Although there are master degrees in respiratory care the bulk of clinical education occurs in bachelor and associate degree programs.

Phenomenological studies focus on a common lived experience. “The fundamental model of this approach is textual reflection on the lived experiences and practical actions of everyday life with the intent to increase one’s thoughtfulness and practical resourcefulness or tack” (van Manen, 1990, p. 4). Data were collected using in-depth participant interviews and data analysis followed a modified version of the Stevick-Colaizzi-Keen method. Participants’ statements were used to describe the essence of the clinical experience.

This is a process of getting at the essence of the meaning expressed in a word, phrase, sentence, paragraph or significant non-verbal communication. It is a crystallization and condensation of what the participant has said, still using as much as possible the literal words of the participant. (Hycner, 1985, p. 282)

Trustworthiness was maintained from the beginning of data collection by recording and immediately transcribing interview statements. This ensured two forms of the data existed. Notes taken during the interviews were compared to the audio transcriptions. Member checks with the participants occurred once the data were transcribed and categorized according to dominant statements. Participants were presented a copy of the transcript with the significant statements highlighted. Affirmation of the transcribed and categorized content was provided. This type of member checking ensured the researcher’s interpretations of interview statements were consistent with the participant’s intention. The methodology reported in chapter three was followed closely to ensure dependability of the study findings. In an effort to maintain confirmability of the findings, I remained aware of the assumptions I have as the Director of Clinical Education and a faculty member in a respiratory care program. These beliefs are

pertinent to a phenomenological study but were bracketed to avoid influencing the participants' statements. Comparing data from all three groups of participants and research findings from the available literature allowed for cross verification thus validating the findings through data triangulation.

Limitations and Delimitations

Limitations and delimitations identify weaknesses inherent in the study that potentially impact transferability of the study's findings (Bloomberg and Volpe, 2012). Although similarities between the two terms exist they are technically different when considering methodology and results analysis for a qualitative study.

Limitations are external conditions that restrict or constrain the study's scope or may affect its outcome. Delimitations, on the other hand, are conditions or parameters that you as the researcher intentionally impose in order to limit the scope of the study (e.g., using participants of certain ages, genders, or groups; conducting the research in a single setting). (Bloomberg and Volpe, 2012, p. 103)

Below I address the conditions that served as a limitation and delimitation for data collected and results analysis for this study.

First, student participants were asked to provide perceptions following a clinical experience; therefore, participant memory of their neonatal and pediatric clinical education experience can impact the information provided during the interviews and serve as a limitation. Participants were encouraged to follow-up with the researcher if additional information was remembered after the conclusion of the interviews. Second, limited exposure to the participant was seen as a limitation. Participants were recruited to

complete a single interview about the clinical experience. Although some interviews lasted over an hour, it is possible that participants remembered additional details after departing the interview. To limit the negative outcomes associated with a single exposure, participants were encouraged to contact the researcher in the event additional details were remembered. However, follow-up contact with the participants did not result in additional information. Third, clinical experiences for the participants can be viewed as a limitation to the study. Clinical experiences will more than likely be different across the country depending on regional practices at different hospitals and respiratory care programs. It would be impossible to capture clinical experiences across all respiratory care students given the number of programs and clinical affiliates. Therefore, it will be difficult to transfer the findings to all neonatal and pediatric clinical rotations. A delimitation of the study involved the boundaries I set to limit the scope of the study. Specifically, the participants were only interviewed about their perceptions of the neonatal and pediatric clinical experience. Therefore, it will be difficult to transfer the findings from this study to respiratory care clinical rotations involving other patient populations or experiences. A larger study focusing on all clinical rotations would yield substantially more information and may provide insight into the strengths and weaknesses of respiratory care clinical education. However, overall the findings do provide insight into the neonatal and pediatric clinical perceptions from randomly sampled students, directors of clinical education and clinical instructors.

Conclusions

The conclusions provided below are presented in three parts based on the research questions for this project. Selected resources from the literature review and additional literature are included to reinforce the conclusions drawn from the findings and discussions in chapter four. Equally, the additional literature will be presented as a comparison to perceptions studies completed in other healthcare fields, specifically nursing and medical school.

Research Question One: What limitations and strengths do respiratory care students believe exist for the neonatal and pediatric critical care clinical rotation? The student participants' statements support the conclusion that participation in clinical activities is both the greatest strength and a strong limitation of the critical care clinical rotation experience. Active participation during clinical rotations is the objective of a clinical course and the preference for respiratory care student participants of this study. The findings presented above are similar to available research focusing on the nursing (Hickey, 2005; Hartigan-Rogers, Cobbett, Amirault and Muise-Davis, 2007) and the physician (Dolmans et al., 2008) professions. Hickey's (2005) dissertation examined the attitudes of nursing graduates towards their clinical experiences, the importance of those experiences, and their preparation for entry into practice. In the qualitative portion of Hickey's (2005) study, participants discussed their perceptions of clinical preparation. Nursing participants commented negatively toward the clinical experience when it offered non-real world nursing opportunities, e.g. taking vital signs, attending to activities of daily living, and caring for only one patient (Hickey). The nursing students viewed the above examples as nursing aid responsibilities and beneath the level of education

obtained by a nursing graduate (Hickey). Positive comments were triggered when a nursing clinical experience included more patients, more “real” nursing responsibilities, more hours, and more independent functioning (Hickey). Hickey summarized the students’ comments by saying, “There were not enough opportunities to practice “real” nursing, to learn to prioritize, to provide care for more than one patient, and to learn to interact with other members of the health care team” (p. 97). In a similar study, Hartigan-Rogers et al. (2007) interviewed nursing graduates on their perceptions of the clinical rotation. The authors provided the following statement to summarize student perceptions,

Participants placed high importance on attaining nursing skills and knowledge during undergraduate clinical placements; thus, they wanted clinical placements that enabled frequent opportunities to practice psychomotor, communication, time management, and organizational skills. Participants who did not have these opportunities tended to be dissatisfied with their clinical intersession placements. Several referred to specific skills they acquired in their placements and still use as graduates. (Results and Discussion, para 4)

The student participant statements included in chapter four of this dissertation contained identical sentiments as expressed by nursing students in the Hickey and the Hartigan-Rogers et al. studies.

As mentioned above, there is research literature available to demonstrate medical student perceptions of their clerkship rotations. Medical school clerkships are completed prior to graduation during the third and/or fourth year of medical school. Dolmans et al. (2008) investigated medical student perceptions of the clinical setting and the factors that negatively impact learning in that environment. The medical student participants

completed a clerkship, or clinical training, starting in the fourth year of their undergraduate medical school curriculum. Medical school clerkships expose students to a wide variety of physician practice areas, e.g. Internal Medicine, Surgery, Obstetrics, Pediatrics, Neurology, Ophthalmology, etc. Dolmans et al. used a quantitative questionnaire to assess working climate, organization, learning effectiveness and supervision of the clerkship. The authors also added open-ended, qualitative questions to ascertain student perceptions of the strengths and weaknesses of the clerkship. Quantitative results indicated that students wanted more opportunities to independently examine patients and they believed the preceptor supervision time needed improvement. Qualitative results provided the following student perceptions of the rotations, “lack of motivation for teaching among staff and a negative attitude towards students, too many students competing for too few patients, and poor organization [sic] of the students’ time and experiences” (Dolmans et al., 2008, Discussion section, para 1). The authors concluded,

Taken together, the findings of this study suggest that direct observation and feedback are too infrequent in our students’ clerkship sites, regardless of how overall supervision at the sites was rated. The inhibitory factors identified are likely interrelated. For example, when there are too many students, they likely are less able to examine enough patients and staff will have less time for supervising individual students. (Discussion section, para 1)

Dolmans’ (2008) findings are very similar to the findings of this study. The limited number of patients and greater access to patient care procedures were strong limitations as noted by the respiratory care student participants. Some of the factors inhibiting

learning among the medical students, as reported by Dolmans et al. (2008), were also reported by the student participants in this study. Too many students competing for patients, clinical instructors' actions, and low patient census influenced the respiratory care students' perceptions of the clinical experience.

Respiratory care students reported positive feelings toward a clinical rotation with numerous and varied patient care activities. There is acceptance, although not viewed as ideal, for observation-only rotations and complete disregard for a rotation lacking patient care activities. The path to clinical competency involves meaningful clinical experiences with copious amounts of hands-on participation. Can a rotation devoid of patient contact still hold value for clinical students? Can professional and personal development still occur if the student is not physically interacting with the patient, actually manipulating treatment modalities used on the patient, and/or interacting with other healthcare providers? Situated learning can still occur when the student is only observing healthcare providers in action versus when the student is participating in the action. Let's take the example of a respiratory care student observing a common scenario of respiratory care practice, a therapist performing bag-valve mask ventilation on an infant. The respiratory care student can learn a lot about resuscitation technique, securing the mask comfortably to the face, providing a tidal volume consistent with normal ventilation, maintaining an adequate respiratory rate, ways of manipulating the patients head and neck to achieve ventilation, assessing chest rise and monitoring physiologic parameters during observation. The respiratory care student can then use that information when participating in the same procedure on future patients. However, the respiratory care student cannot appreciate the proprioceptive aspects of resuscitation – the hand strength to secure the

mask to the face, the “feel” of lung compliance changes associated with disease and lung hyperinflation, the feel of proper head and neck positioning – or the skill associated with maintaining an adequate minute ventilation for the infant. It’s understandable, from a student perspective, to prefer a rotation offering patient participation versus a rotation offering only observation of patient care activities. As an educator this preference is equally appreciated. However, the comments from the directors of clinical education and the instructors who participated in this study indicate that some rotations will not offer complete hands-on participation. Due to the particular environment and the critical nature of the patient some rotations will not provide limitless student involvement. Therefore, learning from observation needs to be an education strategy during clinical rotations when participation is not available or possible. If observation is the strategy of choice for the clinical rotation then clinical instructors need to be able to provide a level of education to meet the goals set by the program for the clinical course. It seems students need to be prepared to receive information through observation and learning activities need to be implemented post-observation to reinforce material. As another option, clinical simulation manikins can present a participatory scenario for the students in healthcare programs. The clinical simulation manikin scenario can be used before and after the clinical rotation as a strategy to prepare students and as a reflective strategy on what was experienced. Clinical simulation manikins should not replace a clinical rotation with patient interaction though because clinical simulation manikins and the clinical simulation scenario may not be able to replace everything that the hospital environment can offer. For example, in the neonatal intensive care unit physicians, nurses, pharmacists and respiratory therapists provide the bulk of care for premature infants. However, a

respiratory care program will be hard pressed to provide that kind of access to experts in a clinical simulation scenario. There needs to be a blending of direct patient care and clinical simulation use.

Another important question related to the observation versus participation debate is, can new graduates develop the necessary skills to function in the healthcare establishment of today and tomorrow if the clinical rotation is lacking patient care activities? Respiratory care graduates are required to possess greater cognitive knowledge and psychomotor skills to function in today's healthcare environment. The American Association for Respiratory Care (AARC) sponsored a project, *2015 and Beyond*, "to identify potential new roles and responsibilities of RTs in the year 2015 and beyond, and to suggest the elements of education, training, and competency-documentation needed to assure safe and effective execution of those roles and responsibilities." (Kacmarek, Durbin, Barnes, Kageler, Walton, and O'Neil, 2009, p. 376). The project consisted of three conferences with attendees representing key stakeholders of the respiratory care profession. The goal of the second conference, *Educating the Future Respiratory Therapy Workforce: Identifying the Options*, "was to identify and reach a general agreement on the competencies required to fulfill the scope of practice described in the first conference for graduate RTs and the RT workforce." (Barnes, Gale, Kacmarek and Kageler, 2010, p. 603). The attendees recommended 69 competencies (grouped into 7 areas) that are needed by the respiratory therapy graduates in 2015 and beyond. See appendix F. The conference attendees defined a graduate respiratory therapist as a person who has completed an accredited respiratory care program, per CoARC standards, but has not passed the registered respiratory therapist (RRT) examinations (Barnes et al.,

2010). The conference attendees did not address how these competencies should be taught and assessed during the respiratory therapy education; however, the attendees of conference three provided the following recommendation for the use of clinical simulation manikins in educating respiratory therapists. “The AARC encourages clinical department educators and state affiliates’ continuing-education venues to use clinical simulation as a major tactic for increasing the competency of the current workforce.”

(Barnes, Kacmarek, Kageler, Morris, Durbin, 2011, p. 684). The authors went on to add,

In the current and future education of RTs, the use of simulation undoubtedly will need to increase significantly. There are numerous capabilities, both in computer and human simulation, that may play a valuable role in RT education... While the experience of direct patient care cannot be replaced, valuable knowledge and practice can be gained in the safety of the simulation environment... Given the current variety of simulation platforms and the expanding education needs of future RTs, simulation in didactic and clinical scenarios will be invaluable. (p. 689)

Clinical instructor actions also proved to be an important strength and limitation to the rotation. Student participants discussed the impact of instructor actions, the use of feedback, the trust extended to the student, and the skill level of the instructor. Hickey (2005) commented on the student-teacher relationship when assessing nursing students perceptions. Hickey reported that clinical instructor experience influenced the amount of independence entrusted upon the students. Hickey (2005) shared the following qualitative statements from the study participants.

More experienced instructors were described as “give students more independence” and “helped me to develop my clinical judgment and skills.”

Another response indicated that instructors who “work with us in a facilitative manner” enhanced learning. Instructors who communicated clear plans and expectations for the clinical rotation enhanced learning, according to one respondent. Another respondent indicated instructors who actively sought learning opportunities for students enhanced learning. (p. 92)

Student participants for the current study also reported differences in clinical instructor experiences. Some clinical instructors provided a greater amount of freedom to care for the sick infants and children. Some instructors offered valuable feedback to the students and demonstrated a level of trust in the students that created a positive perception for the instructor and the rotation.

Feedback is paramount to learning. Herrington and Oliver (2000) included coaching and scaffolding as one of the nine critical components for ideal practice. If delivered correctly and timely the feedback was always welcomed by the participants. Performing procedures incorrectly offers opportunities for practice and the remediation associated with the practice is not viewed negatively unless handled poorly by the clinical instructor and hospital staff. Herrington and Oliver (2008) also believed access to experts was an important guideline for ideal practice. Experts possess numerous points of view that have been acquired since beginning their journey as a novice. Student participants commented frequently on the knowledge and skill of the clinical instructors. When students were matched with instructors with expertise related to the neonatal and pediatric environment there were greater reports of positive experiences. Although not a

major theme generated from the interview data, feedback was mentioned by student participants. The students commented on the clinical instructor actions toward providing feedback and how those actions impacted their clinical experience. When Addison struggled mastering a procedure one clinical instructor offered feedback that influenced the student's perceptions of the instructor and the rotation. When feedback was constructive the student reported a positive experience. When feedback was insufficient the student perceived the experience negatively. The literature search conducted for this study did not reveal any respiratory care reports along these topics. Therefore, this study will add these findings to the available literature and demonstrate the similarities of respiratory students to other healthcare students. Acceptance during the clinical rotation was interpreted by the student participants as creating a level of trust from their instructors. Student participants quickly picked-up on the level of trust instilled upon them by the clinical instructor and other staff and commented on how it influenced their perceptions of the rotation. When lack of trust existed the students rarely participated in clinical procedures and reported a negative experience for the rotation. Knowles (1973) discusses four assumptions of andragogy.

Andragogy assumes that the point at which an individual achieves a self-concept of essential self-direction is the point at which he psychologically becomes adult. A very critical thing happens when this occurs: the individual develops a deep psychological need to be perceived by others as being self-directing. Thus, when he finds himself in a situation in which he is not allowed to be self-directing, he experiences a tension between that situation and his self-concept...It is my own observation that those students who have entered a professional school or a job

have made a big step toward seeing themselves as essentially self-directing. They have largely resolved their identity-formation issues; they are identified with an adult role. Any experience that they perceive as putting them in the position of being treated as children is bound to interfere with their learning. (Knowles, 1973, p. 45)

This statement reinforces the impact that clinical instructor actions can have on student learning. Students participating in clinical programs tend to view the clinical experiences as the most important components to their learning. The available literature offers sound examples. “Clinical placement provides students with optimal opportunities to observe role models, practice by oneself, and reflect on what is seen, heard, sensed, and done” (Chan, 2002, p. 70). Durning and Artino (2011, p. 189) provide the following pearl that can be useful for clinical instructors, “...instead of focusing primarily on content (information given from the teacher to the learner), teachers must also pay close attention to demonstrating when and how (or, the situations in which) this information could and should be used.” This statement has huge significance when considering clinical education. Clinical students need more than content; they need the scenario as well. Bailey’s comment during the interviews speaks to the validity of this point,

I didn’t really feel like I was learning a lot. The RTs would try to show me equipment and they would show me the transport bed and the vents hooked up and everything. But it’s not the same when you don’t have a kid. I can only retain so much if I’m not really seeing it in action.

Bailey, and the other student participants, want the content in the right context. They want to learn about high frequency oscillatory ventilation while it is being used on the

patient. They want to learn about giving surfactant and performing chest percussion therapy while actively doing those procedures. Without performing those procedures perhaps there's an interference with the self-concept of learning and self-direction as discussed by Knowles above.

The expectation theme was common among the student participants and somewhat unique to the available healthcare literature. DiFrancesco's dissertation addressed how expectation impacts knowledge construction among pharmacy students. Unmet expectations became an obstacle to learning during clinical rotations (DiFrancesco, 2011). In his study pharmacy students interpreted certain activities as being irrelevant and a waste of time and thus learning did not progress (DiFrancesco, 2011). DiFrancesco also used situated learning as the theoretical framework for his study. Lave and Wenger (1991) discuss how personal identity impacts learning. I'll address expectation and learner personal identity in a later section of this chapter. There is literature comparing actual and preferred perceptions that clinical students hold for the clinical learning environment; however, it is not entirely clear what impact these expectations have on the clinical experiences and learning. If students develop realistic expectations for a rotation does the perception for the rotation change? What impact does realistic and unrealistic expectations have on outward demeanor expressed by the student, trust by the clinical staff, and learning?

Brown et al. (2010) assessed the perceived and preferred expectations of Australian undergraduate health science students using Chan's Clinical Learning Environment Inventory (CLEI). The students were selected from the following professions, Occupational Therapy, Physiotherapy [Physical Therapy], Emergency

Health [paramedics], Midwifery, Nutrition & Dietetics, Pharmacy, Social Work, Radiography and Medical Imaging. The CLEI is made up of two forms, an actual and a preferred, and each form has 42 items that provides an assessment of six subscales personalization, student involvement, task orientation, innovation, individualization and satisfaction (Brown et al., 2010; Chan, 2002a; Chan, 2003; Chan 2004; Chan and Ip, 2007). The CLEI has undergone extensive testing and use since its development in 2001. Chan (2003) offers the following description, “The CLEI consists of the actual form, which measures student perception of the actual learning environment, and the preferred form, which assesses student perception of the learning environment ideally liked or preferred. Although item wording is similar for actual and preferred forms, instructions for answering them are different.” (p. 523). Student participants of Brown’s study demonstrated significant differences between their perceptions of the actual learning environment and the preferred environment. Student’s preferred a more positive clinical environment than what they experienced or perceived as being present during the rotation (Brown et al., 2010). Specifically, personalization was scored highest on the actual form and task orientation was scored highest on the preferred form, meaning those domains were viewed most importantly of the six domains assessed. Personalization represents opportunities to interact with clinical personnel, such as their clinical instructor and other clinical staff, and the personnel’s concern for the students’ welfare (Chan, 2003). Task orientation represents the extent to which clinical activities are well organized and clear (Chan, 2003). Brown’s participants felt personalization was most important after completing their clinical rotation. Prior to the rotation, Brown’s participants felt task orientation was the most important domain. As addressed above, the participants in this

dissertation viewed hands-on activities and completing procedural competencies positively. The connection to the CLEI could be made by saying the respiratory care students demonstrated preference for task orientation; although, we can't make any actual to ideal comparisons. Several respiratory care students also reported positive perceptions of the care environment and the teamwork demonstrated during the rotation. For example, Harley and Jordan both expressed negative views for the clinical environment prior to the rotation. Following the rotation, both held positive views and both commented that the team atmosphere was very appealing. As a reminder, Brown et al reported that students scored highest on the personalization domain of the actual form. A loose comparison could be made that the respiratory care students are drawing similar perceptions after having experienced a clinical environment in which socialization with the clinical instructor and other healthcare providers produces a positive experience. Previous studies using nursing students also reported high personalization scores (Chan and Ip, 2007; Chan, 2004). Changing the clinical environment to meet student expectations is the major consideration. Brown et al concluded that despite a preference for a more favorable environment there is no conclusive evidence that students would benefit academically due to this environment. This is the first study focusing on respiratory therapy students that reported similar findings to the nursing studies by Chan and the health science study by Brown et al.

The treatment strategy/environment theme offers many similarities to Chan's personalization domain. In addition to opportunities to interact with clinical personnel, such as a clinical instructor and other clinical staff, there were opportunities for some of the student participants to be a part of the treatment team, to feel respected for the therapy

provided to the patient. As addressed in the literature review, nursing students value being identified as a member of the healthcare team and develop a feeling of empowerment (Levett-Jones & Lathlean, 2008; Papp et al., 2006; Ranse & Grealish, 2006; Nolan, 1998). Several of the student participants made similar statements in this study. Students valued a team-based approach to patient care and enjoyed the feeling of camaraderie when participating in healthcare provider rounds. Also, participation in healthcare provider rounds allowed the students to become familiar with other medical professionals like physical therapists, nurses, pharmacists, resident physicians, attending physicians, etc. This provided a sense of acceptance among the staff. Papp et al. (2006) and Ranse and Grealish (2006) reported on the importance of staff acceptance among nursing students and how it influences perceptions and student learning. Several of the student participants talked about participating in healthcare rounds and the positives gained from that activity. Interdisciplinary teams in the healthcare setting are the norm because positive patient outcomes and greater staff satisfaction can be directly linked to a team approach (Cassard, Weisman, Gordon, and Wong, 1994; Lemieux-Charles and McGuire, 2006). Durning and Artino (2011) offer the following example of communities of practice in physician training,

Physicians are a community of practice involved in the activity of providing medical care to patients. From a situativity theory perspective, for a trainee (medical student or resident/registrar) to become a board certified physician, legitimate peripheral participation is needed – the trainee must care for patients under conditions allowing progressively higher levels of autonomy and under the direction of one or more mentors (cognitive apprenticeship). Thus, increased

learning is tied to increased self and community identity, i.e., “belonging” to the community. Cognitive apprenticeships, communities of practice, and legitimate peripheral participation epitomize the situated nature of knowledge, thinking, and learning in everyday practice. (p. 191)

Any education program that has a clinical requirement, such as nursing, respiratory therapy, clinical lab science, etc., can replace the word physician above and find the quote applicable to their profession.

Research Question Two: What limitations and strengths do directors of clinical education believe exist for the neonatal and pediatric critical care clinical rotation? The neonatal and pediatric environment can be a challenging place to complete a clinical rotation. The directors of clinical education appeared to support the conclusion that participation was a strength, depending on the site used, and a limitation for the rotation as a whole. The DCE participants believed the neonatal and pediatric sites met the expectation set for the clinical rotation. However, student expectations appeared to be different than DCE expectation. Students wanted to participate in all aspects of care. The DCEs believed that level of participation was not possible. It seems necessary that expectations should be clearly discussed with the students prior to the rotation. The DCE participants believed the dynamics of the patient care areas and the time available for neonatal and pediatric students to rotate through the areas were a strong limitation for the NICU and PICU rotation. It is unlikely that students will be able to provide care to the very fragile patients. The DCEs recognized that some neonatal and pediatric clinical sites may not be able to provide a complete educational experience consistent with the complement of care provided at other sites. The amount of time spent in a clinical

rotation has been debated and continues to generate spirited conversations between program faculty and accreditation agency representatives. The respiratory care accreditor, CoARC, has replaced the clinical hour requirement for respiratory care programs in support of clinical quality language. This preference allows program faculty to determine the time necessary to achieve a quality clinical experience. To ensure clinical rotations provide acceptable training to students CoARC Standards provide multiple ways to document that the clinical experience is of sufficient quality and duration. See appendix A for the complete CoARC Standards document. Given the number of ways to demonstrate compliance with COARC's standard having a strict clinical hour requirement doesn't appear to be necessary. It has been argued that establishing a specific time period to complete a clinical procedure does not guarantee a quality experience for all students. Gaberson and Oermann (1999) speak to the dilemma surrounding the clinical time versus clinical quality issue.

Most nursing faculty members worry far too much about how many hours students spend in the clinical setting and too little about the quality of the learning that is taking place. A 2-hour activity that results in critical skill learning is far more valuable than an 8-hour activity that merely promotes repetition of skills and habit learning. Nurse educators often worry that there is not enough time to teach everything that should be taught...a rapidly increasing knowledge base assures that there will never be enough time. There is no better reason to identify the critical outcomes of clinical teaching and focus most of the available teaching time on guiding student learning to achieve those outcomes. (pp. 13)

The authors also described the established clinical time as “...insufficient for some students and unnecessarily long for others to acquire a particular skill” (Gaberson and Oermann, 1999, pp13).

Clinical simulation manikins were mentioned as an option to providing experience that is missed or unavailable during the neonatal and pediatric rotation. Simulation manikins could be an option to increase the exposure time to neonatal and pediatric clinical activities. Clinical simulation manikins were addressed in the conclusion for research question one. There are some hurdles to adding a clinical simulation manikin component to the curriculum. First, the cost of high fidelity simulation manikins potentially prohibits widespread application currently. The cost associated with purchasing a simulator manikin can range from \$30,000 to \$200,000 and depends on the fidelity level for the simulator (Rauen, 2004). Second, the costs associated with running the simulator needs to be realized. It takes an expert who is trained in the use of the computer system to run the human simulator and the myriad of scenarios the simulator can provide. Increasing faculty and staff lines in academia is usually a challenge. Third, there are a limited number of students who can participate in the simulation scenario at any given time (Radhakrishnan, Roche, and Cunningham, 2007). Therefore it will be a challenge to accomplish all clinical competencies for all students in large programs. Lastly, the faculty time associated with preparing students for the clinical simulation exercises. The learning curve can be steep for both faculty and students and the time this learning takes can pull from other activities.

Returning to Herrington and Oliver’s (2000) critical components for ideal practice, there are several limitations that the neonatal and pediatric clinical experience

presents to respiratory care students. Specifically, authentic activities and coaching and scaffolding appeared to be a challenge when interviewing the DCEs and some students. The DCEs recognize that some neonatal and pediatric sites will not allow students to participate in procedures on certain patients. Equally, there are several limitations to the use of a neonatal and pediatric clinical simulation strategy. Namely, authentic contexts, access to experts, and collaborative construction of knowledge can be difficult to achieve for some programs. Some clinical simulation scenarios could possibly require doctors, nurses and other allied health providers available to participate in some of the simulations. Obviously the environment is one of the weaknesses for neonatal and pediatric clinical rotations.

Both DCEs praised the clinical instructors that were available and believed proper training of the clinical staff was important. Instructor orientation and training programs, including the use of inter-rater reliability, are becoming more popular in respiratory care programs around the country. Preceptor inter-rater reliability is an accreditation requirement by CoARC. Program DCEs are charged with assessing the reliability of preceptor evaluations of student procedural competency. There is literature supporting the use of video as a means to assess clinical instructor interrater reliability on adult competency procedures (Russian, Harkins, Marshall, Engelhardt and Shamrock, 2008). However, no study was found related to clinical instructor interrater reliability in the neonatal and pediatric rotation. A preceptor-training program specific to the neonatal and pediatric rotation does not exist at this time. The role of the clinical instructor, as perceived by the DCEs, is paramount to the success of the neonatal and pediatric rotation.

A knowledgeable and skilled clinical instructor is also a strength of the rotation. Having access to an expert can increase the likelihood of procedure participation for students.

Research Question Three: What limitations and strengths do clinical instructors believe exist for the neonatal and pediatric critical care clinical rotation? Much like the DCEs, the clinical instructor participants recognized the challenges of providing learning activities in the neonatal and pediatric areas. The available literature also supports the challenges of entering and learning in certain hospital environments (Hunter, Spence, McKenna & Iedema, 2008). Premature infants tend to be critical and require minimal stimulation. Since respiratory problems encompass the largest number of hospitalizations, pediatric admissions decrease during seasonal time periods. Both of these examples can interfere with patient interaction opportunities for students completing clinical rotations and there are few mechanisms to avoid these hurdles. Clinical rotations can be scheduled during busy time periods to increase the likelihood of a high patient census. However, this practice is easier said than done. Realistically the busy time periods for medical procedures are during the daytime hours. In addition the winter months generate the highest pediatric patient admissions. However, it is nearly impossible to rotate every respiratory care student through a hospital strictly during the busy time of the day and the busy months. Clinical instructors can hope for few minimal stimulation cases in the units and can focus student interaction on other available patients. The clinical instructors for the neonatal and pediatric rotations have a daunting task of finding clinical activities for students. “Adequate learning cannot take place without appropriate learning opportunities...”(Hickey, 2005, p.103).

Clinical instructors can sense and reward student motivation to participate in rotation activities. “Teaching is a multidimensional process that is influenced by many factors. These factors arise from both students and faculty: student readiness to learn, familiarity with the subject matter, motivation, and study skills” (Hickey, 2005, p.28). When students are eager to learn the clinical instructor participants hinted they are more likely to seek out patient care opportunities. Students that showed an interest and an aptitude in the learning activities received preferential treatment and the clinical instructors viewed those students more favorably. Hickey (2005) generated similar conclusions from her study of nursing students and their perceptions of the clinical rotation.

Students must arrive at the clinical experience prepared; they must also be provided with adequate learning opportunities. Depending on the clinical site, the learning opportunities may be different. Additionally, the learning opportunities may not be available for students who are not adequately prepared to participate in those activities. (p. 86)

The two clinical instructors interviewed mentioned the implementation of additional development activities prior to the rotation and a longer time spent in the hospital could potentially increase student learning and participation during the rotation. The time issue was addressed above with the DCE comments. It does seem plausible to implement pre-clinical learning activities to prepare students for the clinical rotation. If the pre-clinical activity does not use high or low fidelity simulation then laboratory activities at a minimum should be incorporated. The activities should be specific to the type of environment the students will experience in the hospital. Meaning the equipment

used in the lab should be the same as the hospital's equipment and the procedures practiced should be similar to the hospital environment.

Key Findings Across All Study Participants

The key findings from this study are: 1) participation in respiratory procedures is a major priority for the clinical rotation 2) the neonatal and pediatric environment offers unique challenges that potentially inhibit student involvement, 3) clinical instructor factors, such as providing feedback and level of experience, play an important role in student experiences and perceptions especially in the neonatal and pediatric environments, and 4) preparatory activities – on-campus laboratory exercises or manikin simulation - prior to the neonatal and pediatric clinical rotation are positively viewed by participants and may improve student motivation, clinical instructor trust and competency completion during the clinical rotation.

Clinical experiences are a highly valuable component of respiratory care education programs. All participants recognize and favor participation in neonatal and pediatric procedures during the clinical rotation. The challenges to student participation are formidable but can be overcome with proper selection and training of the clinical instructors and sound preparation of the students prior to the rotation. Perhaps directors of clinical education and other respiratory care program faculty can begin to mirror the following strategies used by medical residency programs to ensure success of physician training.

What a resident learns in the course of her residency education is not the result of random patient care experiences. It is purposeful and developmental and reflects –

or should reflect – a careful structuring, sequencing, and progression of roles, activities, and responsibilities to support learning. When an activity is at the boundary of a resident’s competence, the attending will create an opportunity for low-stakes practice by asking the resident to describe the care he intends to administer (“Tell me what you make of this and what you are planning to do”) or having the resident perform the care under direct observation, or both. (Cooke, Irby, & O’Brien, 2010, p.126)

Although not specifically investigated in this study, I suspect most respiratory care clinical rotations are a combination of purposeful clinical activities and random activities. It’s been my experience that random clinical activities far out number the planned, purposeful though. As DCE there is determined effort to create the most productive clinical experience possible. Visiting clinical sites and familiarization with the types of patients admitted to the site and the procedures that are performed is integral to the clinical assignment process. Clinical site selection is key to ensuring students rotate through facilities that can offer access to experts and participation in authentic activities. However, depending on the geographic location of the respiratory care program, clinical site selection may be limited. Clinical simulation manikins can be costly but should be investigated as a pre-clinical option.

Implications for Practice

This study provides a basis for considering changes in current neonatal and pediatric clinical curriculum requirements. Perceptions from students, clinical instructors and directors of clinical education provided the perceived strengths and limitations

regarding neonatal and pediatric clinical education experiences. This information will assist directors of clinical programs to make transformative changes during rotation planning, i.e. student assignment, clinical site selection, clinical instructor selection and clinical instructor assignment. This study demonstrates to directors of clinical education and clinical instructors that pre-rotation, mid-rotation, or post-rotation assessment, teaching material and training is important and should be required for the neonatal and pediatric clinical rotations. In addition, directors of clinical education should be alerted to regularly assess if students and clinical instructors need additional clinical or didactic material to improve their learning and teaching abilities, respectively. The results of this study could guide future efforts toward researching other aspects of clinical education and toward the development of a clinical education handbook and curriculum to be used by respiratory care programs across the country. I believe this study can spur debate on the true appropriateness and place for neonatal and pediatric clinical education within undergraduate respiratory care education. Should neonatal and pediatric preparation be considered a post-graduate area of study? Certainly there is no lack of depth or breadth regarding information that could be included in a neonatal and pediatric graduate curriculum. A specialty-training track in neonatal and pediatrics could offer both entry-level and advanced-level training in an area of respiratory care that would benefit the student, the patient and the hospital. The track could be created as a certificate program or created under the umbrella of a graduate degree in respiratory care. As mentioned above, respiratory care graduates are required to possess greater cognitive knowledge and psychomotor skills to function in today's healthcare environment. If current students are not practicing and mastering the skills within the clinical environment it is unlikely that

the psychomotor component will be developed during the undergraduate phase of their education. A graduate track for neonatal and pediatrics could provide the necessary cognitive and psychomotor education that the undergraduate curriculum attempts, and potentially struggles, to provide. If neonatal and pediatric education is maintained at the undergraduate level the employer will carry the burden of developing entry-level clinical skills required of the new graduate to function as a member of the patient care team. Hospitals are not accredited for the task of providing cognitive and psychomotor educational experiences for respiratory care students. Hospitals are able to provide continuing education competency skills assessment but these educational endeavors tend to focus on practice within each individual facility. Hospitals definitely have a role in the education of clinical students. However, the hospital should participate in the entry-level education of students under the guidance of an educational program and clinical instructor who is familiar with the goals of the clinical and didactic curriculum. The education program should be tasked with setting goals and objectives, not the hospital. The clinical environment should allow students to consolidate classroom knowledge and practice procedural skills in a real-time situation. The clinical component of respiratory care education has time and placement limitations. Therefore, it is imperative that the clinical rotation experiences provide the necessary learning environment to achieve student outcomes in-line with the program goals, accreditation requirements and future employment needs.

The issue of choosing between abstract and very specific instruction can be viewed in the following way. If abstract training is given, learners must also absorb the money and time costs of obtaining supplemental training for each

distinct application. But if very specific training is given, they must completely retrain for each application. Which is to be preferred, and to what extent, depends on the balance among (a) the cost of the more general abstract training, (b) the cost of the specific training, (c) the cost of the supplemental training for application of abstract training, and (d) the range of jobs over which the learner is likely to have occasion to apply what was learned. (Anderson, Reder, and Simon, 1996, p. 8)

If we apply the above to respiratory care education and the respiratory care student we can get a sense of the type of what to expect. Respiratory Care programs have three options when it comes to educating students. Option one, only teach abstract, theoretical concepts in the classroom and hope that students revisit material and procedures when they reach the clinical environment following graduation. Option two, teach abstract, theoretical concepts in the classroom then move to on-campus, laboratory experiences to reinforce the specific information in the classroom. Similar to option one there is no clinical rotation during the undergraduate program. Option three, teach abstract concepts in the classroom, reinforce material in the laboratory and then expose the students to patients during undergraduate clinical rotations. Options one and two place huge resource and financial burdens on the hospital to complete entry-level training. In addition, students carry the burden of being motivated to direct their own education outside of the classroom and after graduation. There is also the potential for an additional financial burden for students depending on the hospital's needs. Option three places most of the burden on the schools. As we learned from Flexnor's report, the schools should carry this burden and the focus should be on proper education.

The quote by Anderson, Reder and Simon (1996) has huge implications for respiratory care programs and hospital administrators. The fundamental questions are: How well trained do we want our students upon graduation? Are we willing to make the financial and time commitments to reach the goal? Do we want the hospital/employer to bear the full burden of training healthcare providers in certain specialty areas? The student participants generally viewed the neonatal and pediatric experience positively if hands-on, participative activity existed. However, that type of experience is not ubiquitous across all hospitals, respiratory care programs, students and clinical instructors. If the clinical environment on its own is not going to provide the rich, authentic experiences that we want - whether because of patient availability, clinical instructor comfort, hospital policy, etc. – then an alternative experience needs to be introduced. One available alternative involves using patient simulation manikins and treatment scenarios. Clinical simulation is widely used in the nursing profession and there is literature to support its use (Kardong-Edgren, Willhaus, Bennett and Hayden, 2012; Hayden, 2010, Radhakrishnan, Roche, and Cunningham, 2007). There is limited documented evidence of simulation use in the respiratory care profession. Also, there is not a clear understanding of the costs associated with purchasing and managing the manikins.

Implications for Policy

This study will inform the national accreditation body for RC education—CoARC— of the strengths and limitations of neonatal and pediatric critical care clinical education experiences. This study can provide CoARC with information on neonatal and pediatric

clinical rotations to determine whether policy adjustments are necessary. CoARC develops the standards for clinical requirements for all respiratory care programs across the nation. Currently, the educational programs set specific clinical requirements for the neonatal and pediatric clinical rotations. This study will allow program faculty and CoARC to determine if standards for clinical education should be changed. Currently the National Board for Respiratory Care (NBRC) generates two board exams that contain specific neonatal and pediatric content, i.e. the Neonatal/Pediatric Specialty (NPS) Exam and the Clinical Simulation Examination (CSE). See appendix F and appendix G for the content outlines for both exams. The NPS exam consists of multiple-choice questions/answers with content specifically covering neonatal and pediatric care (NBRC, 2014). The CSE, not to be confused with clinical simulation manikins, is a computer exam consisting of patient management problems designed to simulate reality and the relevance of clinical practice (NBRC, 2014). The adoption of clinical simulation manikins and exercises into the curriculum could be used to prepare students for both exams. Table 5.1 lists the most common clinical competency procedures associated with neonatal and pediatric clinical practice. Clinical simulation manikins could be used to address these competencies in the event that the hospital rotation was not able to provide the student with the experience. In addition, laboratory exercises and clinical simulation scenarios could allow for pre-clinical competency assessment of all of the procedures listed in table 5.1. This could potentially increase clinical instructor trust in the students and may allow for a more meaningful clinical experience. It is also possible that a hospital accreditor may require clinical competency assessment prior to clinical

placement. This would offer reassurance to the hospital staff that all procedures have been practiced in a laboratory setting prior to direct patient care.

Table 9. Common Procedural Competencies for Neonatal and Pediatric Patients.

Procedural Competencies	
Chest Assessment and Vital Signs	Assessment & Resuscitation
X-ray Interpretation	CPR Airway and Ventilation
Oxygen Administration	Apnea Monitoring
Transport with Oxygen	Bulb Suctioning
Pulse Oximetry	Endotracheal Suctioning
Transcutaneous Monitoring	Nasopharyngeal Suctioning
Metered Dose Inhaler	Nasotracheal Suctioning
Dry Powered Inhaler*	Closed Endotracheal Suctioning
Small Volume Nebulizer	Open Endotracheal Suctioning
In Line Metered Dose Inhaler	Invasive Ventilator Setup
In Line Small Volume Nebulizer	Routine Ventilator Check
Chest Physiotherapy	Ventilator Parameter Change
Manual Ventilation via ETTube	Ventilator Circuit Change
Set Up and Ventilation Via Mask	Surfactant Replacement Therapy
Aerosol Administration	Capillary Blood Gas Sampling
UltraSonic Nebulizer	Noninvasive Ventilator Setup
Tracheostomy/Tube Care	Noninvasive Ventilator Check
Tracheal HME with Oxygen Adaptor	Manual ventilation during transport
Nasal CPAP Administration	Hyperinflation Therapy
Securing Artificial Airway	Mucus Clearing Therapy
Intubation/Extubation	Cuff Management
* Requires a minimum inspiratory flowrate and may not be applicable for younger patients.	

Currently, respiratory care accreditation standards do not allow clinical simulation experiences to take the place of hospital clinical rotations. The foundation of this standard is not in question. You would be hard pressed to find a respiratory care educator to discount the benefits of students rotating through a NICU, a PICU, an AICU, a pulmonary function laboratory or a pulmonary rehabilitation center. At the very least, observation of authentic patient care environments was desired by the student participants of this study. As a reminder, Bailey said, “I mean it was really good experience just to see what a NICU is like...” To complement the limited experience that is received during clinical rotations the respiratory care program could add clinical simulation manikins to the curriculum. There is no accreditation standard preventing a program from using simulation manikins to reinforce clinical experiences and complete clinical competencies. However, should simulation be a required component to receive program accreditation? This is an easy question to answer until the costs associated with simulation manikins are realized. As discussed above, it can be financially prohibitive for some institutions to acquire a full fleet of high fidelity simulation manikins. In addition to the equipment costs there are personnel costs. The technology is not intuitive enough to run the simulation computer without extensive training and repeated use. But focusing on the problem area(s) can reduce costs. The participants of this study, mainly the students and the DCEs, commented on the limited number of days available for the neonatal and pediatric experiences in comparison to the adult experiences. In addition the availability of a hospital offering neonatal and pediatric experiences is much lower compared to hospitals offering adult experiences. Therefore, it seems clinical simulation in the neonatal and pediatric clinical education realm should be a requirement as a way to

supplement actual hospital experiences. Obviously this recommendation places a huge financial burden on respiratory care programs that may not have access to the necessary funds to implement clinical simulation. However, creating an accreditation requirement can sometimes motivate college and university administrators to find available monies.

Implications for Theory Development

Published literature on the perceptions held by respiratory care students, respiratory care directors of clinical education, or respiratory care clinical instructors toward the limitations and strengths of neonatal and pediatric respiratory care clinical education was not located during the literature search for this study. The perceptions of three specific populations intimately involved in critical care clinical education within an allied health profession were generated from the participant interviews. The information obtained from this study offers a means of comparison of respiratory care students and respiratory care education with other healthcare students and educational programs, i.e. nursing, pharmacy and medical school/residency training. This study extended the current research related to perceptions of clinical education by adding new knowledge as it relates to the respiratory care profession. The project generated, through in-depth participant interviews, the perceptions held by respiratory care students, directors of clinical education, and respiratory care clinical instructors thus offered future researchers a starting point for theory development. However, theory development is not possible given the infancy of the research in this area and the nature of phenomenological studies. Hycner says,

Obvious too, is the fact that the phenomenological researcher's primary thrust is to understand, and as much as possible not to interpret according to some already [sic] developed theory... Phenomenology is still relatively new and still at a foundational stage and there is not enough of a body of knowledge to attempt a more comprehensive integration of theory. Also, at the core of phenomenology is the very deep respect for the uniqueness of human experience and that this ever present uniqueness will always make the attempt to develop a totally comprehensive theory of human experience an ultimately futile one. It is the uniqueness of the human being which constantly instills novelty and unpredictability into any attempt to totally and comprehensively "capture" the phenomenon of human experience. (1985, p. 300)

But the concept map is a tool to begin the process of theory development. As stated in chapter 1, "... a concept map is not something that you do once and are finished with; you should go back and rework your concept maps as your understanding of the phenomena you are studying develops" (Maxwell, 2013, p. 64). Therefore, it was anticipated that the original conceptual framework would change at the conclusion of the study. Figure 5.1 offers a reconfiguration of the original conceptual framework after considering the findings of this study. Once the data were gathered and themes began to emerge there appeared to be other factors involved that influenced clinical rotation experiences for respiratory care students. Additional factors such as patient care opportunities and hospital policy/personnel proved to be quite impactful of the student perceptions. As with any clinical rotation it is difficult to guarantee patients will be available for student interaction. This is especially true for neonatal and pediatrics. Most

healthcare providers will support the idea of student clinical rotations because it is a part of nearly all healthcare education programs. However, hospital administrators may be less supportive of student involvement in the care of critical patients. Therefore it is not unheard of to have policy and procedure limiting student involvement and access to some critical care areas, e.g. deliveries and flight transport. Although not represented within this model structure there are other factors, hidden considerations, which would also play a role in clinical rotations. For example, if a hospital staff member is planning to serve as the preceptor for the students it needs to be determined if the staff has the proper training for that role. Has the staff member completed a preceptor-training program offered by the respiratory care program? Does the staff member truly want to serve in the capacity of preceptor or have they been assigned this role unwillingly? The same holds true for clinical instructors and their development to guide students during clinical rotations. Another factor involves the clinical instructor's familiarity with the hospital he/she will enter. If the instructor does not have a history of working or rotating through the hospital or unit assigned then it is likely that some resistance between hospital staff and the instructor could exist. Staff and students could interpret the unfamiliarity with the hospital surroundings and policy/procedures negatively. This unfamiliarity could lead to hesitation in actions and also be interpreted negatively by staff and students. These are just some of the hidden factors that could influence the success of a clinical rotation.

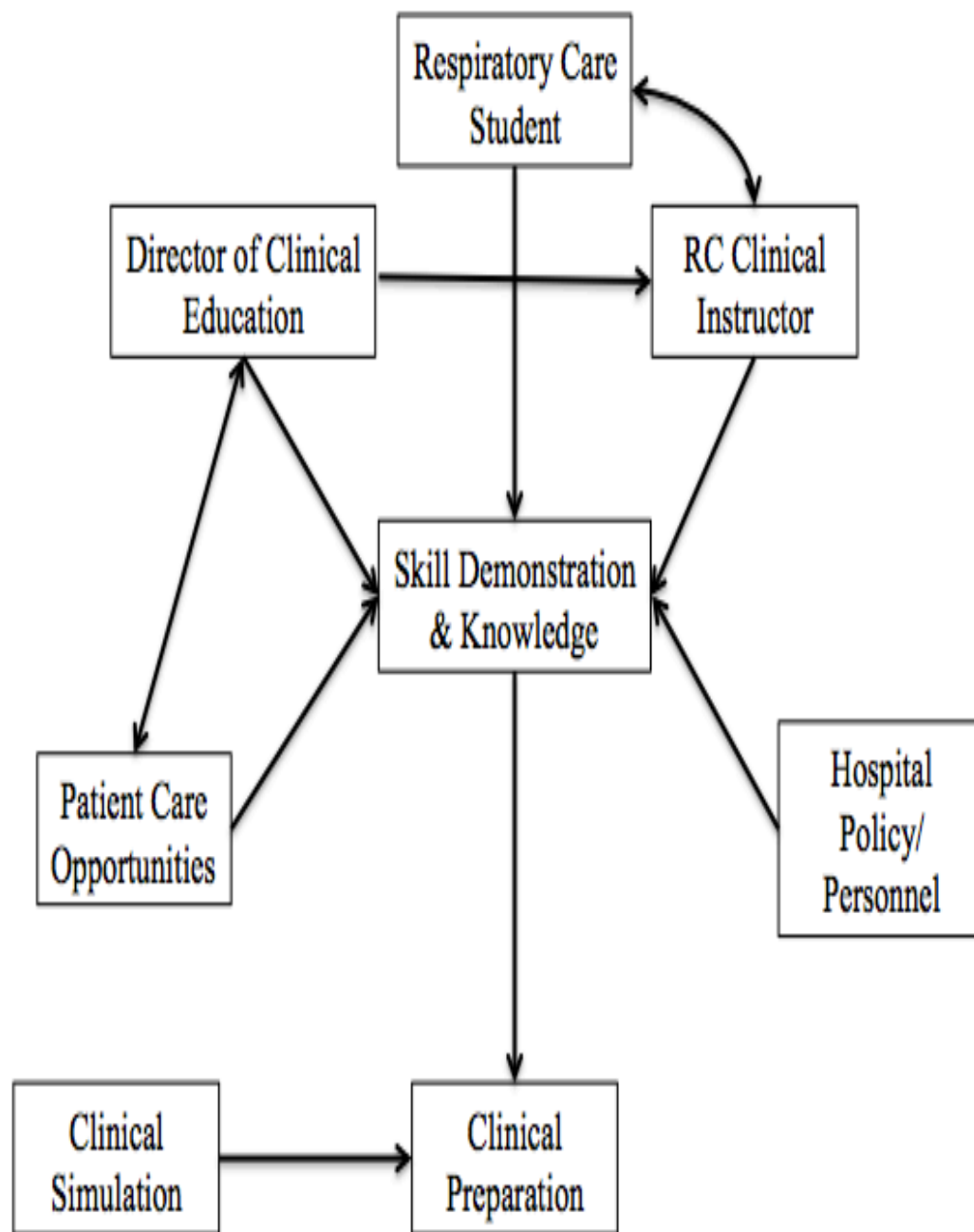


Figure 2. Revised Conceptual Model:

Multiple Contributing Factors Toward the Clinical Preparation
for Respiratory Care Students

Revisiting the Theoretical Perspective

Engagement in a community of practice, in the social world of the experts, is integral for learning to occur (Lave and Wenger, 1991). It requires participation to gain access to the activities, the artifacts, the knowledge and the identities (Lave et. al., 1991). Refinement of knowledge through social situations and interactions with experts forms the foundation of situated learning (Pitri, 2004).

Learning viewed as situated activity has as its central defining characteristic a process that we call legitimate peripheral participation. By this we mean to draw attention to the point that learners inevitably participate in communities of practitioners and that mastery of knowledge and skill requires newcomers to move toward full participation in the sociocultural practices of a community (Lave and Wenger, 1991, p. 29).

Participation is legitimate in that the newcomers, or students as it pertains to this dissertation, are able to interact with actual experts in the community of practice. “The form that the legitimacy of participation takes is a defining characteristic of ways of belonging, and is therefore not only a crucial condition for learning, but a constitutive element of its content” (Lave and Wenger, 1991, p. 35). Peripheral does not imply being located off to the side and uninvolved. “Peripherality suggests that there are multiple, varied, more- or less-engaged and –inclusive ways of being located in the fields of participation defined by a community. Peripheral participation is about being located in the social world” (Lave and Wenger, 1991, p. 35-36).

For the student participants of this study, learning neonatal and pediatric respiratory therapy procedures was situated in the participatory aspects of their clinical

rotations and with their clinical instructors. It's not to imply that the theoretical, abstract information shared in the classroom is unimportant. Both the authentic situations and the theoretical concepts are critical to the success of respiratory therapy programs. But the medical education model relies heavily on clinical teaching and authentic experiences. Resnick (1987) identifies the differences between activities in the classroom and activities in the job environment.

Briefly, schooling focuses on the individual's performance, whereas out-of-school mental work is often socially shared. Schooling aims to foster unaided thought, whereas mental work outside school usually involves cognitive tools. School cultivates symbolic thinking, whereas mental activity outside school engages directly with objects and situations. Finally, schooling aims to teach general skills and knowledge, whereas situation-specific competencies dominate outside. (p. 15)

Although Resnick's focus is directed toward workplace learning for non-students, there are clear correlations between the workplace learning she describes and clinical rotations for healthcare students. Students access cognitive tools - e.g. pocket guides with therapy information, crib sheets with calculation reminders - and seek out providers and other students to discuss patient care. The hospital is definitely a social environment that is evolving into a team-based treatment model where the mental aspects of patient care are socially shared (Mitchell et al., 2012). Also, there is a focus on specific therapeutic procedural competencies for most health professionals. Ergo, there is an interest in ensuring the clinical learning environment is producing results to satisfy curricular and future employment requirements.

Research question one of this study focuses on the strengths and limitations of respiratory care students. During interviews students provided perceptions of the neonatal and pediatric rotation. Patient interaction, treatment strategy/environment, clinical instructor actions and expectations were the significant statements/themes generated during subsequent analysis. Based on student comments and significant statements it was concluded that the greatest strength and limitation of the neonatal pediatric rotation was participation in clinical activities. Situated learning/situated cognition provides the perfect lens through which to interpret this strength and limitation, as well as many of the other statements/themes by the students.

Altogether, the students participating in this study wanted patient interaction and when clinical participation did not meet their needs it was viewed negatively. For example, Sage shared mostly positive comments regarding the clinical experience; however, one regret was the level of participation during newborn deliveries. Sage said, “I thought it would have been nice to have had more hands on and have done stimulating or getting APGAR scores other than just sit back and watching every time. I thought that was the main weakness.” The APGAR score is a backronym, created by Dr. Virginia Apgar that stands for Appearance [color], Pulse [heart rate], Grimace [reflex irritability], Activity [muscle tone], and Respirations. “The Apgar score comprises 5 components: heart rate, respiratory effort, muscle tone, reflex irritability, and color, each of which is given a score of 0, 1, or 2. The score is now reported at 1 and 5 minutes after birth” (American Academy of Pediatrics, 2006, p. 1444). A healthcare provider is required to manipulate and palpate parts of the infant’s body to generate an APGAR score. For example, to retrieve a heart rate the healthcare provider will need to palpate the

pulsations of the heart, usually through the umbilical stump, and count the number of beats per minute. Typically the provider uses the first three fingers of one hand to palpate the pulse and two fingers of the other hand to visually “tap out” the pulse frequency for other providers to see. There are visual cues for the other items of the APGAR scoring assessment as well. That being the case, other providers in the room can tally an APGAR score without having to physically manipulate the newborn. Sage describes a scenario that did not provide a participatory experience consistent with desired levels of activity or involvement.

Participation is always based on situated negotiation and renegotiation of meaning in the world. This implies that understanding and experience are in constant interaction – indeed, are mutually constitutive. The notion of participation thus dissolves dichotomies between cerebral and embodied activity, between contemplation and involvement, between abstraction and experience: persons, actions, and the world are implicated in all thought, speech, knowing, and learning. (Lave and Wenger, 1991, p. 51-52)

Because Sage was not allowed to participate there was a broad separation between understanding and experience. It could be said that for Sage the lack of embodied activity potentially limited the cerebral activity. The reality is that the participatory experience was there but the people around Sage did not initiate the participation possibly because they did not appreciate the opportunity.

What impact does lack of participation have on a student? Worse yet, what impact does lack of participation have on a student when other classmates have a collection of

varied participatory experiences? Both Harley and Mel made comments that deserve additional attention through the legitimate peripheral participation lens. Harley said,

There were times I felt like some people weren't comfortable, I guess, with students being there. There weren't a lot of people but I felt like we learned a lot more when we were actually able to be hands on. I felt like with them being confident in us I felt like we felt more confident.

Mel experienced very limited activity when rotating through the neonatal intensive care unit. Mel described the NICU experience by saying, "When I did get to go in with a patient they [the staff] did everything and didn't really explain what they were doing a lot." These statements by Harley and Mel demonstrate the struggles faced by clinical students. I think both cases demonstrate there can be significant power separation within the clinical environment between students and other healthcare providers, specifically clinical instructors, other respiratory staff, nurses and physicians. Lave and Wenger offer theory on the impact that participation and non-participation potentially have on participants in the social community.

Furthermore, legitimate peripherality is a complex notion, implicated in social structures involving relations of power. As a place in which one moves toward more-intensive participation, peripherality is an empowering position. As a place in which one is kept from participating more fully – often legitimately, from the broader perspective of society at large – it is a disempowering position. Beyond that, legitimate peripherality can be a position at the articulation of related communities. In this sense, it can be a source of power or powerlessness, in affording or preventing articulation and interchange among communities of

practice. The ambiguous potentialities of legitimate peripherality reflect the concepts pivotal role in providing access to a nexus of relations otherwise not perceived as connected. (Lave and Wenger, 1991, p. 36)

Bailey experienced very limited participatory opportunities during the rotation and made the following comments,

The first day I don't think I even did anything. I pretty much observed... But as the days went on, I still didn't do anything... I didn't really feel like I was learning a lot... From talking with other classmates they had so much more to do and I was a little bit jealous. I was hoping to get in there and it would be hands-on but it wasn't really like that.

It is conceivable that student opportunities can be impacted based on the clinical instructor's confidence and comfort in the student's ability, whether those abilities have been displayed or not to the instructor. The level of participatory experience by the student is likely to be interpreted, at least through the lens of Lave and Wenger, as a measure of power or powerlessness. As a result, there are potential implications on student interest in the clinical environment, in the program of study, and future job seeking locations. Incidentally, the disempowering position proposed by Lave and Wenger above also relates to Sage's experience in the delivery room. It is likely that Sage felt a measure of disempowerment due to limited participation with APGAR scoring. The final result was a negative view of the rotation/experience.

Although this dissertation did not explicitly investigate the development of identity as a result of clinical involvement, there seemed to be an emergence of this

component of learning. Lave and Wenger (1991) briefly discuss the role identity plays in legitimate peripheral participation.

Viewing learning as legitimate peripheral participation means that learning is not merely a condition for membership, but is itself an evolving form of membership.

We conceive of identities as long-term, living relations between persons and their place and participation in communities of practice. Thus identity, knowing, and social membership entail one another. (Lave and Wenger, 1991, p. 53)

It is possible that a lack of participation during the clinical rotation could be internally processed as a loss of social membership and an unfavorable identity as it relates to the role of student therapist. Bailey's limited involvement during the rotation and Sage's negative interpretation of the delivery room experience come to mind. Wenger (1998) provides a more extensive coverage of identity in his text. Wenger considers identity as a component of social participation. Wenger describes identity as "a way of talking about how learning changes who we are and creates personal histories of becoming in the context of our communities" (p. 5). If the clinical rotation is full of patient interaction and therapeutic procedures then it is possible that those students view themselves as a member of the communities through which they rotated. Billet (2006) wrote that our sense of identity is linked to how we think about and engage in our work. "Our identity becomes anchored in each other and what we do together... It is not easy to transform oneself without the support of a community..." (Wenger, 1998, p.89). The students that experienced a lot of participation reported more positive views of the rotation, the preceptors and the experience. "Participants forge new identities from their new perspectives" (Wenger, 1998, p. 90). An in-depth study of personal identity as it relates to

respiratory care students and their level of participation during clinical rotations would provide valuable information to directors of clinical education, program faculty and accreditors of respiratory care programs. Participation means “discovering how to engage, what helps and what hinders; developing mutual relationships; defining identities, establishing who is who, who is good at what, who knows what, who is easy or hard to get along with” (Wenger, 1991, p. 95).

A fundamental problem with clinical rotations is that the experiences in the clinical setting can be uncontrollable and even worse non-existent at times. Comments by multiple participants in this study verify the above statement to be a reality. If clinical instruction is suspect, or critically different from what is received in the classroom, then learning and knowledge acquisition may be negatively impacted.

Abstract instruction can be ineffective if what is taught in the classroom is not what is required on the job. Often this is an indictment of the design of the classroom instruction rather than of the idea of abstract instruction in itself.

However, sometimes it is an indictment of the job situation. (Anderson, Reder and Simon, 1996, p. 8)

We as faculty try to structure our courses so that information gets revisited and reinforced in the laboratory and the clinical settings. However, this is not always possible and full-time faculty may not be available to instruct students during all clinical rotations. But the disconnect between classroom and clinic is real and unfortunately the students in the hospital interact with staff that reinforce the quote above from Anderson et al.

Experienced practitioners are quick to say to the neophyte student therapist, *there is a difference between textbook knowledge and hospital knowledge. You're in the hospital*

now, not the classroom. This implies the classroom instruction is out-of-touch with clinical practice. Student motivation and attention in the classroom is likely to suffer. Ideally, the clinical activities would mirror the classroom instruction. This is probably an unrealistic goal to set given the amount of information required to pass the numerous respiratory care national board exams and the specific competencies required of respiratory therapists. But the clinical site may require a tailor-made curriculum. Lave and Wenger (1991) discuss the idea of a learning curriculum. They say it,

Evolves out of participation in a specific community of practice engendered by pedagogical relations and by a prescriptive view of the target practice as a subject matter, as well as out of the many and various relations that tie participants to their own and to other institutions. (Lave and Wenger, 1991, p. 97)

It is probably foolish to believe that didactic teaching in the classroom covering textbook information and examples will completely suffice as the primary source for clinical preparation. The learning curriculum cannot be created and used apart from the social situations that the students will experience and that make up legitimate peripheral participation (Lave and Wenger, 1991).

The clinical site is of paramount important to respiratory care programs. The clinical experiences should not be considered simply as *potential* opportunities for learning. They must be viewed as requirements for successfully passing the clinical course and advancing forward in the program. Lave and Wenger stress the importance of participation as a learning tool.

To begin with, newcomers' legitimate peripherality provides them with more than an "observational" lookout post: It crucially involves *participation* as a way of

learning - of both absorbing and being absorbed in – the culture of practice.” An extended period of legitimate peripherality provides learners with opportunities to make the culture of practice theirs. From a broadly peripheral perspective, apprentices gradually assemble a general idea of what constitutes the practice of the community. This uneven sketch of the enterprise (available if there is legitimate access) might include who is involved; what they do; what everyday life is like; how masters talk, walk, work, and generally conduct their lives; how people who are not part of the community of practice interact with it; what other learners are doing; and what learners need to learn to become full practitioners. (Lave and Wenger, 1991, p. 95)

Recommendations for Future Study

Upon completion of this study it appears that additional research is needed to elevate respiratory care clinical education with that of medicine, nursing and other allied health professions. Although the research questions for this study are answered there are still areas that warrant further investigation. The bulk of the research in the literature review and the supporting literature in the discussion focused on nursing studies. This dissertation will add to the available respiratory care literature but the profession lacks research on the level of other professions, both in quantity and scope. Therefore the areas for future investigation, as they relate to respiratory care, are numerous and varied. I will address a few of the areas that could benefit the respiratory care field with additional study.

First, the development of an objective assessment of student perceptions of clinical rotations is the next step for the researcher. Although qualitative assessment provides a lot of valuable information the time constraints and the challenges associated with qualitative research potentially limit its use in medical education. The lack of familiarity with qualitative research will more than likely limit its use in the respiratory care field. Also, the bias that exists toward quantitative research extends to the journals that are pursued for publication of the results. The vast majority of scholarly articles published in medical journals have a quantitative methodology. *Respiratory Care Journal*, the scientific journal for the Respiratory Care profession, publishes a greater number of quantitative articles versus qualitative articles. The same can be said for nursing journals; although the nursing profession has a large number of journal options thus producing a respectable number of qualitative articles (McKibbin and Gadd, 2004). The reason for the greater preference for quantitative methods over qualitative methods can be illustrated by Giacomini and Cook (2000),

Clinicians are trained to think mechanistically and to draw conclusions using pathophysiologic rationale and deductive reasoning. The biomedical literature reflects this orientation, and clinicians are therefore most familiar with deductive quantitative research. Quantitative studies (such as epidemiologic investigations and clinical trials) aim to test well-specified hypotheses concerning some predetermined variables. These studies suitably answer questions such as whether (e.g., whether an intervention did more good than harm), or how much (e.g., how strongly a risk factor predisposes patients to a disease). (p. 357-8)

Needless to say, a quantitative survey will allow distribution and inclusion to a larger number of subjects and lead to greater generalizability of the findings for the respiratory care community. Of course, the beginnings of any survey are usually rooted in previous qualitative work. The beginnings of a respiratory care clinical education quantitative survey are already in place based on the findings of this study. I have started developing a survey that can be distributed to respiratory care program faculty, respiratory care clinical instructors and students in an effort to gather clinical rotation data. In addition to the data from this project, there are three clinical learning surveys that provided the foundation for the development of the proposed respiratory care survey (Chan, 2001; Chan, 2003; Salamonson, Bourgeois, Everett, Weaver, Peters & Jackson, 2011; Saarikoski, & Leino-Kilpi, 2002; Saarikoski, Isoaho, Warne & Leino-Kilpi, 2008). However, before I discuss these three surveys let me provide a brief history on assessing learning environments. Moos and Trickett (1974) developed the Classroom Environment Scale (CES) as a way to assess the social climate of classrooms, specifically junior high and high school. The CES “focuses on the measurement and description of teacher-student and student-student relationships and on the type of organizational structure of a classroom” (Moos and Trickett, 1974, p. 1). Social environments can influence people and people can influence social environments.

The social climate perspective assumes that environments have unique “personalities” just as people do. Methods have been developed to describe aspects of a person’s personality... These methods assess personality traits or needs and provide some information about the characteristic ways in which people behave. Social environments can be similarly portrayed with a great deal

of accuracy and detail. Some people are more supportive than others; likewise, some social environments are more supportive than others. Some people feel a strong need to control others; similarly, some social environments are extremely rigid, autocratic and controlling. Order, clarity and structure are important to many people; correspondingly, many social environments emphasize order, clarity and structure. People make detailed plans which regulate and direct their behavior; likewise, environments have overall programs which regulate and direct behavior of the people within them. (Moos, 1974, p. 1)

The CES has four dimensions and nine subscales (Moos and Trickett, 1974). See Table 5.2. Chan developed his CLEI based on the work of Moos and Trickett in addition to other classroom environment authors (Fraser and Fisher, 1983). As mentioned above, Chan's questionnaire allows for the assessment of actual and preferred learning environments. "Having both actual and preferred forms of educational environment instruments allows exploration of whether students achieve better when there is higher similarity between the actual classroom environment and that preferred by students" (Chan, 2001, p. 628). Chan's survey is not readily available on the Internet, although, it can be purchased directly from Dr. Chan. There is an abbreviated version of the CLEI. Salamonson et al (2011) created a shorter version of the 42-item CLEI called the CLEI-19. Figure 5.2 shows the nineteen items of the CELI-19. The authors report that the CLEI-19 provides information on the satisfaction that nursing students place on clinical learning. The two areas for the CLEI-19 are satisfaction for the clinical facilitator and the clinical facility. These two areas would also be important to respiratory care clinic

education. Student satisfaction with the clinical site and the clinical instructor could impact learning.

Table 10. Clinical Environment Scale (CES) Subscale Descriptions

Dimensions	Subscales
Relationship Dimensions:	<u>Involvement</u> : measures student's attentive interest in class activities and participation in discussions. Consideration for additional work on their own and enjoyment of the class.
	<u>Affiliation</u> : measures student's friendship for each other; helping with homework, easy familiarization, enjoy working together.
	<u>Teacher Support</u> : measures help, concern, friendship teacher directs toward students. Teacher talks openly with students, trusts them, and show interest in ideas is considered.
Personal Development Dimensions:	<u>Task Orientation</u> : importance to complete planned activities. Emphasis the teacher places on staying on the subject is assessed.
	<u>Competition</u> : emphasis on student's competition for grades and recognition. Difficulty of achieving good grades is assessed.
System Maintenance Dimensions:	<u>Order and Organization</u> : emphasis on orderly and polite behavior and on organization of assignments ad class activities. Student's tendency to remain calm and quite is considered.
	<u>Rule Clarity</u> : emphasis on establishing/following clear rules and consequences of not following rules. Teacher's consistent punishment for breaking rules is considered.
	<u>Teacher Control</u> : strictness of the teacher's enforcement and punishment severity. The number of rules and ease of breaking rules is considered.
System Change Dimension:	<u>Innovation</u> : student involvement in planning class activities; unusual and varying activities planned by teacher. Extent of using new techniques and encouraging creative thinking.

Abbreviated Clinical Learning Environment Inventory (CLEI-19)

Instructions: We would like to know what your last clinical placement was **ACTUALLY** like. Indicate your opinion about each statement by selecting your response

No	Item	Strongly agree	Agree	Disagree	Strongly disagree
1	The clinical facilitator was considerate of my feelings.	SA	A	D	SD
2	The clinical facilitator talked to, rather than listened to me.	SA	A	D	SD
3	I enjoyed going to my clinical placement.	SA	A	D	SD
4	The clinical facilitator talked individually with me.	SA	A	D	SD
5	I was dissatisfied with my clinical experiences on the ward/facility.	SA	A	D	SD
6	The clinical facilitator went out of his/her way to help me.	SA	A	D	SD
7	After the shift, I had a sense of satisfaction.	SA	A	D	SD
8	The clinical facilitator often got sidetracked instead of sticking to the point.	SA	A	D	SD
9	The clinical facilitator thought up innovative activities for students.	SA	A	D	SD
10	The clinical facilitator helped me if I was having trouble with the work.	SA	A	D	SD
11	This clinical placement was a waste of time.	SA	A	D	SD
12	The clinical facilitator seldom got around to the ward/facility to talk to me.	SA	A	D	SD
13	This clinical placement was boring.	SA	A	D	SD
14	The clinical facilitator was not interested in the issues that I raised.	SA	A	D	SD
15	I enjoyed coming to this ward/facility.	SA	A	D	SD
16	The clinical facilitator often thought of interesting activities.	SA	A	D	SD
17	The clinical facilitator was unfriendly and inconsiderate towards me.	SA	A	D	SD
18	The clinical facilitator dominated debriefing sessions.	SA	A	D	SD
19	This clinical placement was interesting.	SA	A	D	SD

Figure 3. The Abbreviated CLEI-19 Questions.

Saarikoski et al (2002) also created a nursing survey to determine perceptions of the clinical learning environment and clinical supervision. The Clinical Learning Environment and Supervision instrument (CLES) was originally tested on Finnish nursing students. Saarikoski et al revised the instrument in 2008 by adding an assessment of the nursing teacher. The new CLES-T provides the same assessment as the CLES with the addition of the nurse teachers' pedagogical and social role-dimensions. See appendix H for an example of the CLES-T. All three surveys – the CLEI, the CLEI-19 and the CLES-T – have been subject to validity and reliability testing. The survey for the respiratory care profession will build from the three surveys mentioned above in addition to adding information generated from this project. Specifically, the respiratory care survey will include questions on the amount of patient participation, student perceptions of the clinical instructor and the clinical site, and student expectations prior to and after the survey.

A second area of research involves expanding the study to other clinical rotations, e.g. adult patient rotations, pulmonary rehabilitation, pulmonary function testing, intubation rounds, physician rounds, and emergency medical services. This area of research would offer a means of comparison across clinical rotation options. Some of the rotations listed above, e.g. pulmonary function testing, intubation rounds, physician rounds, are considered specialty rotations with reduced clinical day and competency requirements. It would be interesting to learn if students perceive the adult rotations or the specialty rotations differently than the neonatal and pediatric rotations. A further comparison could be made by assessing clinical rotations completed at teaching hospitals versus clinical rotations completed at non-teaching hospitals. Is it possible that a teaching

hospital can offer greater procedural competency options than a non-teaching hospital? These types of comparisons would provide meaningful data on the competencies and patients made available to respiratory care students. Also, this type of research could inform CoARC about the best location for future respiratory care programs. Should future respiratory care programs be located near health science centers and teaching hospitals? This information could be considered more strongly with additional research.

Third, a study to gain additional data from respiratory care program chairs and directors of clinical education regarding the creation of clinical rotation guidelines is necessary. For example, should the profession be setting competency standards for clinical rotations? As addressed above CoARC standards do not set strict guidelines on clinical rotations. As discovered from this study there can be clinical differences between hospitals and between rotations. Should standards reflect a minimum competency requirement for certain rotations? Data from program directors and directors of clinical education could provide a global view of clinical operations and if changes are needed. These data could be shared with CoARC to determine if a change in standard is warranted. The history and thinking behind the current CoARC standard is understandable. The current rule allows programs to police and manage their own affairs while also demonstrating that proper education is occurring. However, setting a minimum clinical expectation may create better clinical education outcomes.

Fourth, directors of clinical education assume a large amount of responsibility when developing clinical schedules. It would be important to investigate the director's decision-making process to develop a clinic rotation. What limitations do they experience when deciding on the number of days and the number of hours? What limitations are

present to hire dedicated clinical instructors for all rotations? What financial allowances must be present for that to happen? What are the thought processes when bringing a new hospital on-board or removing a hospital from a clinical rotation offering? A survey of all respiratory care programs for clinical instructor data, e.g. instructor pay strategy, degree information, years of experience, preference of student numbers, teaching strategies, would compliment the current study. Having this information would also allow directors of clinical education to better recruit and retain qualified instructors.

Fifth, there are accreditation standards for the program chair/director and the DCE. There are no accreditation standards for the other faculty or the clinical faculty. Does a clinical instructor with a bachelor degree lead to better outcomes versus an associate degree clinical instructor? Should CoARC set standards for all respiratory care faculty? Do full-time faculty serving as the clinical instructor generate better learning outcomes and superior board exam pass rates to part-time clinical instructors? Also, do students prefer a part-time or full-time clinical instructor and the reasons for the preference? This research idea is not intended to generate animosity between bachelor degree programs and associate degree programs. The intention is to determine if minimum educational standards should be implemented to increase the potential for improved student outcomes. Educational standards are already in place for the program director and director of clinical education. These standards apply equally to associate degree programs and bachelor degree programs and neither program question the standard. However, should we extend these educational requirements to all program personnel?

Sixth, explore the aspects of clinical teaching that are most important to the clinical instructors. How do a large number of clinical instructors feel about observation of therapy versus performing hands-on therapy? Walsh et al (2011) completed a quantitative study of managers and educators about the skills of new graduates. This current study recruited respiratory care students, DCEs and clinical instructors. A similar study using new graduates, with a specific focus on those entering the neonatal and pediatric environment would provide complimentary information to these findings and to Walsh's study. This would provide additional information on perceptions of clinical training and their perceptions of preparedness.

Lastly, a study is needed to determine the types of procedural competencies that are completed and the number of clinical competencies that are completed during the neonatal and pediatric clinical rotations? During the student participant interviews of this study a portion of these data were gathered. It became clear that procedures were varied across the participants. Since the focus of this project was elsewhere I was not able to gather these additional data. However, an exploratory study of that type is needed.

The above represents just some of the research ideas needed in the respiratory care world. The respiratory care field is young and limited in terms of available research in comparison to the nursing field. There is always a need for additional research on the clinical environment to improve student learning and success. Most bachelor degree programs have at least one research course in the curriculum. In addition, the number of master's degrees in Respiratory Care have increased over the last several years. Both of these facts should stoke the embers of research in the respiratory care profession.

Final Thoughts

Walsh et al. (2011) demonstrated that knowledge gaps exist when new respiratory care graduates enter the neonatal and pediatric critical care environment. From this study there appears to be a gap between classroom learning and clinical participation in some neonatal and pediatric clinical rotations. The gap is dependent on the student, the clinical instructor and the clinical environment. The differences across clinical facilities and clinical instructors and the types of patients admitted to the hospital create difficulties when developing the neonatal and pediatric clinical rotation. These gaps in learning should be addressed prior to graduation. If addressed, the clinical facilities could reap the rewards because they will be welcoming a more capable respiratory care student during clinical rotations and a more knowledgeable respiratory care graduate onto their team. Ultimately the healthcare field could generate better patient outcomes.

APPENDIX SECTION

APPENDIX A

The Commission on Accreditation for Respiratory Care (CoARC) Accreditation Standards Document.



Accreditation Standards for the Profession of Respiratory Care

Essentials/Standards initially adopted in 1962;
revised in 1972, 1977, 1986, 2000, 2003, and 2010

Adopted by the

AMERICAN ASSOCIATION FOR RESPIRATORY CARE
AMERICAN COLLEGE OF CHEST PHYSICIANS
AMERICAN THORACIC SOCIETY
AMERICAN SOCIETY OF ANESTHESIOLOGISTS

SCHEDULED DATE THESE STANDARDS WILL GO INTO EFFECT IS JUNE 1, 2010

CoARC Standards for the Profession of Respiratory Care

Table of Contents

Revision of Standards: What's Different?.....	4
About CoARC.....	5
CoARC's Mission.....	5
The Value of Programmatic Accreditation	5
Introduction	6
Program Review.....	6
Definitions.....	7
Format of Standards	12
CoARC Accreditation Standards	
Standard I - Program Administration and Sponsorship	12
Institutional Accreditation.....	12
Consortium	12
Sponsor Responsibilities	13
Program Location	13
Substantive Changes	14
Affiliate Agreements.....	14
Standard II - Institutional and Personnel Resources	15
Institutional Resources.....	15
Personnel Resources	15
Key Program Personnel.....	15
Program Director	15
Director of Clinical Education.....	16
Medical Director	17
Instructional Faculty	17
Administrative Support Staff.....	18
Standard III - Program Goals, Outcomes, and Assessment.....	19
Statement of Program Goals	19
Assessment of Program Goals.....	20
Assessment of Program Resources	20
Student Evaluation	21
Assessment of Program Outcomes	22
Reporting Program Outcomes.....	22
Clinical Site Evaluation.....	22
Standard IV - Curriculum	23
Minimum Course Content	23
Minimum Competencies	24
Length of Study.....	25
Equivalency.....	25
Clinical Practice.....	26

Standard V - Fair Practices and Recordkeeping.....	27
Disclosure	27
Non-discriminatory Practice.....	27
Safeguards	29
Academic Guidance.....	29
Student Identification.....	30
Student Records	30
Program Records	31
Appendix A - Initiation and Maintenance of Accreditation.....	32
Applying for Accreditation.....	32
Program and Sponsoring Institution Responsibilities	32

Revision of Standards: What's Different?

- **Philosophy and emphasis** – The Standards have been changed to ensure that all programs prepare students at a competency level consistent with the national credentialing examination for registered respiratory therapists. This level of preparation better equips graduates to begin practice with the professional competencies needed to work effectively in partnership with other healthcare providers. This revision places greater emphasis on the desired foundation and practice, the manner in which programs must assess student achievement of competencies, and the importance of the development of the student as a health care professional. The Standards focus on the development of core and professional knowledge, skills, attitudes, and values, as well as sound and reasoned judgment and the highest level of ethical behavior. The revised CoARC Standards reflect an appropriate balance between the processes to be followed and outcomes to be achieved. Such a balance allows the CoARC to assist programs in meeting high quality accreditation standards and in complying with policies while respecting the institution's mission, governance, innovative efforts, and prerogative to set its priorities.
- **Standards revision processes developed** – The CoARC, in preparation for becoming a freestanding accreditor, has developed a revision process for the Standards. The Standards will be reviewed as needed, but no less than every five (5) years.
- **Standards: volume and terminology** – The Standards have been renumbered, restructured, and clarified. The standards are organized into five sections. The Guidelines used in the previous Standards have either been incorporated into the Standards or removed altogether.
- **Evidence of Compliance**- As a result of feedback received from stakeholders requesting better clarification of the Standards, sections called Evidence of Compliance have been provided to clarify the requirements for compliance with each standard.
- **Definitions** – the use of a definitions list provides clarification of key terms.

About CoARC

The Medical Society of the State of New York formed a Special Joint Committee in Inhalation Therapy on May 11, 1954. One of its purposes was "... to establish the essentials of acceptable schools of inhalation therapy (not to include administration of anesthetic agents) ..." In June 1956, the House of Delegates of the AMA adopted its Resolution No. 12, introduced by the Medical Society of the State of New York. The delegates "Resolved, that the Council on Medical Education and Hospitals is hereby requested to endorse such or similar 'Essentials' and to stimulate the creation of schools of inhalation therapy in various parts of these United States of America." A report entitled, "Essentials for an Approved School of Inhalation Therapy Technicians," was adopted by sponsor participants (AAIT, ACCP, AMA, and ASA) at an exploratory conference in October 1957. The AMA's House of Delegates granted formal approval in December 1962. The first official meeting of the Board of Schools of Inhalation Therapy Technicians was held at AMA's Chicago headquarters on October 8, 1963.

The Joint Review Committee for Respiratory Therapy Education, the successor group to the Board of Schools came into being on January 15, 1970 as a recommending body to the Committee on Allied Health Education and Accreditation (CAHEA). The JRCRTE was dissolved in 1996 and the Committee on Accreditation for Respiratory Care became its successor organization, as a recommending body to the newly formed Commission on Accreditation for Allied Health Education Programs (CAAHEP). In 2008, the Committee on Accreditation for Respiratory Care began the process of becoming an independent accrediting body: the Commission on Accreditation for Respiratory Care (CoARC). The Commission on Accreditation for Respiratory Care became a freestanding accreditor of respiratory care programs on November 12, 2009.

CoARC accredits degree-granting programs in respiratory care that have undergone a rigorous process of voluntary peer review and have met or exceeded the minimum accreditation Standards as set by the professional association in cooperation with CoARC. These programs are granted accreditation status by CoARC, which provides public recognition of such achievement.

CoARC's Mission

The mission of the Commission on Accreditation for Respiratory Care (CoARC) is to serve the public by promoting high quality respiratory care education through accreditation services.

The Value of Programmatic Accreditation

Accreditation provides consumer protection, advances and enhances the profession, and protects against compromise of educational quality. Accreditation also assists in the further improvement of these educational programs as related to resources invested, processes followed, and outcomes achieved.

These accreditation Standards constitute the minimum requirements to which an accredited program is held accountable and provide the basis on which the CoARC will confer or deny program accreditation.

INTRODUCTION

The CoARC and its sponsoring organizations cooperate to establish, maintain, and promote educational standards of quality to prepare individuals for respiratory care practice, and to provide recognition for postsecondary educational programs that meet the minimum requirements outlined in these Standards. These Standards are to be used for the development, evaluation, and self-analysis of respiratory care programs.

Respiratory therapists are members of a team of health care professionals working in a wide variety of clinical settings to evaluate, treat, and manage patients of all ages with respiratory illnesses and other cardiopulmonary disorders. As members of this team, respiratory therapists should exemplify the ethical and professional standards expected of all health care professionals.

Respiratory therapists provide patient care which includes clinical decision-making and patient education. The respiratory care scope of practice includes, but is not limited to the following basic competencies:

- acquiring and evaluating clinical data;
- assessing the cardiopulmonary status of patients;
- performing and assisting in the performance of prescribed diagnostic studies such as: obtaining blood samples, blood gas analysis, pulmonary function testing, and polysomnography;
- evaluating data to assess the appropriateness of prescribed respiratory care;
- establishing therapeutic goals for patients with cardiopulmonary disease;
- participating in the development and modification of respiratory care plans;
- case management of patients with cardiopulmonary and related diseases;
- initiating prescribed respiratory care treatments, managing life support activities, evaluating and monitoring patient responses to such therapy and modifying the prescribed therapy to achieve the desired therapeutic objectives;
- initiating and conducting prescribed pulmonary rehabilitation;
- providing patient, family, and community education;
- promoting cardiopulmonary wellness, disease prevention, and disease management; and
- promoting evidence-based practice by using established clinical practice guidelines and by evaluating published research for its relevance to patient care.

PROGRAM REVIEW

Accreditation of respiratory care programs is a voluntary process that includes a comprehensive review of the program relative to the Standards. Accreditation decisions are based on the CoARC's review of information contained in the accreditation application and self-study report, the report of site visit evaluation teams, the annual Report of Current Status, and any additional requested reports or documents submitted to the CoARC by the program. Additional data to clarify the information submitted by the program may be requested at any time in the review process.

DEFINITIONS

Throughout the Standards, terms that have specific definitions are noted below.

NOTE: Where terms are not defined, their definitions are at the discretion of the CoARC.

Academic Catalog	The official publication of the institution that describes the academic programs and courses offered by the institution. This may be published electronically and/or in paper format.
Academic Policies	Published rules that govern the implementation of the academic program including, but not limited to, policies related to admission, retention, progression, graduation, grievance, and grading.
Academic Support Services	Services available to the program that facilitate faculty and students in any teaching/learning modality, including distance education, in achieving the expected outcomes of the program. These may include, but are not limited to, library, computer and technology resources, advising, counseling, and placement services.
Affiliation Agreement	A legally binding document outlining the terms and details of an agreement between parties, including each parties' requirements and responsibilities. The agreement is signed by administrative personnel who have the authority to act on behalf of the institution or affiliate, from the sponsoring institution and affiliated site. Same as a memorandum of understanding.
Adequate	Allows for the delivery of student education that does not negatively impact program outcomes.
Administrative and Clerical Support Staff	Professional administrative and clerical personnel provided by the sponsoring institution. Professional clerical personnel may be supplemented, but not replaced, by student assistants.
Accurately	Free from error.
Advanced placement	A term used in higher education to place a student in a higher level course based on an evaluation of the student's knowledge and skills.
Affiliate	Institutions, clinics, or other health settings not under the authority of the sponsoring institution but that are used by the program for clinical experiences.
Annual Report of Current Status	A report submitted by a program that contains current personnel, satellite, and clinical affiliate information. In addition, enrollment and retention data and outcomes data each with corresponding analysis and action plans are reported.
Appropriately Credentialed	Refers to a practice credential (i.e. a state license, state certification or state registration) that is required for the individual to practice his/her specific health care or medical profession within the state housing the program. Where indicated, an appropriate credential is a required qualification of the program director, the director of clinical education, and instructional faculty regardless of whether the individual is currently practicing his/her profession.

Assessment	The systematic collection, review, and use of information to improve student learning, educational quality, and program effectiveness.
Action Plan	Provides direction for actions and is a way to determine progress. At a minimum, an action plan should include goals, evaluation criteria and benchmarks, outcomes, actions, and re-assessment.
Base Program	A respiratory care program established by the sponsoring educational institution-where the Program Director and Director of Clinical Education are based.
Consortium	A legally binding contractual partnership of two or more sponsoring institutions (at least one of which is a duly accredited degree-granting institution of higher education) that come together to offer a program. Consortia must be structured to recognize and perform the responsibilities and functions of a sponsoring institution.
Clinical education experiences	Experiences that involve patient care and the application of respiratory care under the supervision of a qualified instructor. They comprise all of the formal and practical “real-life” learning experiences provided for students to apply classroom and laboratory knowledge, skills, and professional behaviors in the clinical environment.
Communities of Interest	Groups and individuals who have an interest in the mission, goals, and expected outcomes of the program and its effectiveness in achieving them. The community of interest comprises the stakeholders of the program and may include both internal (e.g., current students, institutional administration) and external constituencies (e.g., prospective students, regulatory bodies, practicing therapists, clients, employers, the community/public).
Competent	The knowledge, skills and values required by new graduates to begin the practice of respiratory care.
Competencies	Written statements describing the measureable set of specific knowledge, skills, and affective behaviors expected of graduates.
Continued Professional Growth	Activities that facilitate faculty maintenance or enhancement of expertise: such as specialty or recertification; continuing education; formal advanced education; research, publications, and other scholarly activities.
Curriculum	Formally established body of courses and/or supervised practice rotations and learning experiences presenting the knowledge, principles, values and competencies that are intended consequences of the formal education offered by a program.
Critical Thinking	Active and reflective reasoning that integrates facts, informed opinions and observations. Critical thinking transcends the boundaries of formal education to explore a problem and form a hypothesis and a defensible conclusion.

Distance Education	Education that uses one or more technologies (i.e. internet, telecommunication, video link, or other electronic media) to deliver instruction to students who are separated from the instructor and to support regular and substantive interaction between the students and the instructor, either synchronously or asynchronously. Distance education does not include clinical education or the participation in clinical experiences.
Equivalent	Not exact but can be documented as comparable with other similar situations or resources.
Faculty (Program)	The aggregate of individuals responsible for the design, implementation, instruction, and evaluation of the program and its curriculum. These individuals include program faculty members (tenure-track and non-tenure-track), lecturers, clinical supervisors, and all other instructional staff members who are employees of the program.
Faculty (Clinical)	These individuals include off-site clinical supervisors, preceptors, or similar personnel who do not hold employment contracts with the sponsoring institution.
Faculty, Individual/ Full-Time	A qualified paid employee of an institution to teach specific content in the respiratory care curriculum who holds an appointment that is considered by that institution to constitute full-time service. Full-time faculty includes all persons who are employed full-time by the institution, who are appointed primarily to the respiratory care program, and whose job responsibilities include teaching, regardless of the position title (e.g., full-time instructional staff and clinical instructors would be considered faculty).
Geographically distant locations	Also known as Satellite campuses. Locations outside the institution at which the Respiratory Care core didactic and laboratory courses of the program are offered (does not pertain to sites used by a completely on-line/distance education program for individual students). Geographically distant location(s) function under the direction of the Key Personnel of the program.
Goals	Aims of the programs that are consistent with the institutional and program missions and reflect the values and priorities of the program.
Institutional Accreditation	Applies to the total institution and signifies that the institution as a whole is achieving satisfactory educational objectives.
Instructional Faculty	Individuals providing instruction or supervision during the didactic and clinical phases of the program, regardless of length of time of instruction or faculty rank.
Inter-rater reliability	A measure of the extent to which raters agree.
Learning Environment	Places, surroundings or circumstances where knowledge, understanding, or skills are studied or observed such as classrooms, laboratories and clinical education settings.
Learning experiences	Classroom, laboratory, research, clinical, and other curricular

	activities that substantially contribute to the development of a competent graduate. Also referred to as educational experiences.
Length of Study	Duration of the program which may be stated as total academic or calendar year(s), or total semesters, trimesters, or quarters.
Mission	A statement of purpose defining the unique nature and scope of the sponsoring institution or the program.
Must	Indicates an imperative need, duty or requirement; an essential or indispensable item; mandatory.
Objectives	Statements specifying desired knowledge, skills, or behaviors to be developed as a result of educational experiences. Objectives must be measurable.
Outcomes	Results, end products, or effects of the educational process. Outcomes include what the students demonstrated/accomplished or what the program achieved.
Outcomes Assessment	Comprehensive process for evaluating the results of programmatic efforts and student learning.
Outcome Assessment Thresholds	Outcome thresholds are established by CoARC and are related to expectations for graduate success for example, pass rate on the credentialing examinations, attrition, job placement, and graduate and employer satisfaction.
Program	An organized system designed to provide students with the opportunity to acquire the competencies needed to participate in the respiratory care profession; includes the curriculum and the support systems required to implement the sequence of educational experiences.
Program Outcomes	Performance indicators that reflect the extent to which the goals of the program are achieved and by which program effectiveness is documented. Examples include but are not limited to: program completion rates, job placement rates, certification pass rates, and program satisfaction.
Program Improvement	The process of utilizing results of assessments and analyses of program outcomes to validate and revise policies, practices, and curricula as appropriate.
Program Options	Additional offerings by a base program holding continuing accreditation with no pending progress reports. Options include Polysomnography Specialty, Satellite (U.S. and International), and Scheduling.
Progress Report	A written report that the CoARC requires from a program to file to demonstrate that the program has addressed deficiencies specified in a decision letter from the CoARC.
Prospective Students	Individuals who have requested information about the program or submitted information to the program.
Published	Made publicly available in written or electronic format.
Readily available	Made accessible to others in a timely fashion via defined program

	or institution procedures.
Remediation	The program's defined process for addressing deficiencies in a student's knowledge and skills, such that the correction of these deficiencies is measurable and can be documented.
Resource Assessment Matrix (RAM)	A document developed by the CoARC that programs must use to evaluate and maintain on-going resource assessment including purpose, measurement system, dates of measurement, results and analysis, action plans and follow-up.
Satellite campus	A campus geographically separate from the base program at which didactic or preclinical instruction occurs for all or some of the students enrolled.
Sufficient	Adequate to accomplish or bring about the goal, objective or intended result.
Substantive change	A significant modification or expansion of the nature and scope of an accredited program. The process for reporting substantive changes are defined in the CoARC Accreditation Policies and Procedures Manual.
Sponsoring Institution	A post-secondary academic institution accredited by a regional or national accrediting agency recognized by the U.S. Department of Education (USDE) that is wholly responsible for meeting these Standards, or a consortium (see previous definition), in which case the consortium members collectively function as the sponsoring institution.
Standards	The Accreditation Standards for the Profession of Respiratory Care.
Summative Evaluation	A comprehensive assessment of the learner conducted by the program to assure that a learner has the knowledge, interpersonal skills, patient care skills, and professionalism required for entry into the profession.
Student Learning Outcomes	Learning outcomes are measurable learner-oriented abilities that are consistent with standards of professional practice.
Teaching and Administrative Workload	The manner in which the sponsoring organization defines and quantifies the nature of faculty responsibilities. Categories frequently used are teaching, advisement, administration, committee activity, research and other scholarship activity, and service/practice.
Technical Standards	The physical and mental skills and abilities of a student needed to fulfill the academic and clinical requirements of the program. The standards promote compliance with the Americans with Disabilities Act (ADA) and must be reviewed by institutional legal counsel.
Timely	Without undue delay; as soon as feasible after giving considered deliberation.

FORMAT OF STANDARDS

The Standards are divided into five sections: (I) Program Administration and Sponsorship; (II) Institutional and Personnel Resources; (III) Program Goals, Outcomes, and Assessment; (IV) Curriculum; and (V) Fair Practices and Recordkeeping. Within each section, specific Standards elucidate the Commission's requirements in order for a program to be accredited.

Following each Standard, there are items of evidence to be supplied in order for the program to demonstrate compliance with the Standard. The evidence list is included to facilitate response to progress reports and accreditation actions by the Commission, development of self-study reports, preparation for the on-site visit and review of the program by the on-site team and the Commission. Each item of evidence represents the minimal information necessary to determine compliance. Each item must be addressed. Additional information that the program believes supports compliance may also be provided.

CoARC ACCREDITATION STANDARDS

I. PROGRAM ADMINISTRATION AND SPONSORSHIP

Institutional Accreditation

- 1.01 The sponsoring institution must be a post-secondary academic institution accredited by a regional or national accrediting agency that is recognized by the U.S. Department of Education (USDE) and must be authorized under applicable law or other acceptable authority to award graduates of the program an associate or higher degree at the completion of the program.

Evidence of Compliance:

- Valid institutional accreditation letter.

Consortium

- 1.02 When more than one institution (e.g., consortium) is involved in the provision of academic and clinical education, at least one of the members of the consortium must meet the requirements in Standard 1.01. The responsibilities of the consortium and of each member must be clearly documented in a formal affiliation agreement or memorandum of understanding, which delineates instruction, supervision of students, resources, reporting, governance and lines of authority.

Evidence of Compliance:

- Signed, duly executed consortium agreement;
- Organizational chart indicating reporting mechanisms.

- 1.03 The consortium must be capable of providing basic science education, clinical instruction and experience requisite to respiratory care education.

Evidence of Compliance:

- Institutional academic catalog listing programs of study and course offerings;
- Valid institutional accreditation certificates.

Sponsor Responsibilities

- 1.04 The institution (or consortium) must be responsible for:
- a) Assuring that the provisions of these Standards are met;
 - b) Supporting curriculum planning, course selection and coordination of instruction by program faculty;
 - c) Appointment of qualified faculty and staff, including key personnel;
 - d) Supporting continued professional growth of faculty and staff;
 - e) Maintaining student transcripts permanently;
 - f) Managing and processing applications for admission;
 - g) Assuring appropriate supervision for students in all locations where instruction occurs;
 - h) Assuring that appropriate security and personal safety measures are addressed for students and faculty in all locations where instruction occurs;
 - i) Granting the degree documenting satisfactory completion of the educational program.

Evidence of Compliance:

- Duly executed consortium agreement, contract or memorandum of understanding;
- Program policies and procedures;
- Clinical affiliate agreements.

Program Location

- 1.05 Educational programs shall be located in accredited postsecondary institutions, or a consortium member institution, or in facilities sponsored by the U.S. military (as defined in 1.01).

Evidence of Compliance:

- Published institutional academic catalogs and program information.

- 1.06 The sponsoring institution must provide students and faculty at geographically distant locations access to academic support services and resources equivalent to those on the main campus.

Evidence of Compliance:

- Results of CoARC student resource assessment surveys;
- Results of CoARC graduate satisfaction surveys.

- 1.07 Program academic policies must apply to all students and faculty regardless of location of instruction.

Evidence of Compliance:

- Student handbooks;
- Published program policies.

Substantive Changes

- 1.08 The sponsor must report substantive change(s) as described in Section 9 of the CoARC Accreditation Policies and Procedures Manual in a timely manner. Substantive change(s) to be reported to the CoARC within the time limits prescribed include:

- a) Change of Ownership/Sponsorship/Legal status
- b) Change in degree awarded
- c) Change in program goal(s)
- d) Change in the curriculum or delivery method
- e) Addition of the Polysomnography option
- f) Request for Inactive Accreditation Status
- g) Voluntary Withdrawal of Accreditation
- h) Addition of (a) Satellite location(s)
- i) Requests for increases in Enrollment
- j) Change in Program Location or Clinical Affiliates
- k) Vacancy in Key Personnel positions
- l) Change in Key Personnel
- m) Addition of scheduling option(s)
- n) Change in institutional accreditation status

Evidence of Compliance:

- Timely submission and subsequent approval of the CoARC Application for Substantive Change or related documentation required as per CoARC Policies.

Affiliate Agreements

- 1.09 There must be a formal affiliation agreement or memorandum of understanding between the sponsor and all other entities that participate in the education of the students describing the relationships, roles, and responsibilities between the sponsor and that entity.

Evidence of Compliance:

- Copies of duly executed agreement, contract or memorandum of understanding for each affiliate.

II. INSTITUTIONAL AND PERSONNEL RESOURCES

Institutional Resources

- 2.01 The sponsoring institution must ensure that fiscal, academic and physical resources are sufficient to achieve the program's goals and objectives as defined in Standard III, regardless of location and instructional methodology used.

Evidence of Compliance:

- Results of annual program resource assessment as documented in the CoARC resource assessment matrix.

Personnel Resources

- 2.02 The sponsoring institution must ensure the program has a sufficient number of appropriately qualified faculty members, clinical preceptors, administrative and technical support staff to achieve the program's goals as defined in Standard III.

Evidence of Compliance:

- Results of annual program resource assessment as documented in the CoARC resource assessment matrix.

Key Program Personnel

- 2.03 The sponsoring institution must appoint, at a minimum, a full-time Program Director, a full-time Director of Clinical Education, and a Medical Director.

Evidence of Compliance:

- Documentation of Employment;
- Academic Catalog;
- Written job descriptions including minimal qualifications for key program personnel.

Program Director

- 2.04 The Program Director must be responsible for all aspects of the program, including the management, administration, continuous review and analysis, planning, development, and general effectiveness of the program.

Evidence of Compliance:

- Teaching and administrative workload;
- Institutional job description.

- 2.05 The Program Director must hold a valid Registered Respiratory Therapist (RRT) credential and hold such professional license or certificate as is required by the state in which he or she is employed.

Evidence of Compliance:

- State license and RRT verification by the National Board for Respiratory Care.

2.06 The Program Director must have earned at least a baccalaureate degree from an academic institution accredited by a regional or national accrediting agency that is recognized by the U.S. Department of Education (USDE).

Evidence of Compliance:

- Academic transcript denoting the degree earned.

2.07 The Program Director must have a minimum of four (4) years experience as a Registered Respiratory Therapist; of which at least two (2) years must include experience in clinical respiratory care.¹ The Program Director must have a minimum of two (2) years experience teaching in an accredited respiratory care program either as an appointed faculty member or as a clinical preceptor.

Evidence of Compliance:

- Personnel records including a curriculum vitae.

2.08 The Program Director must have regular and consistent contact with students and faculty regardless of program location.

Evidence of Compliance:

- Results of student course evaluations.

Director of Clinical Education

2.09 The Director of Clinical Education must be responsible for organization, administration, continuous review, planning, development, and general effectiveness of clinical experiences for students enrolled in the respiratory care program.

Evidence of Compliance:

- Teaching and administrative workload schedule;
- Institutional job description.

2.10 The Director of Clinical Education must hold a valid Registered Respiratory Therapist (RRT) credential and hold such professional license or certificate as is required by the state in which he or she is employed.

Evidence of Compliance:

- State license and RRT verification by the National Board for Respiratory Care.

¹ Programs accredited prior to 06/01/2010 will be held to this Standard only when a new program director is appointed.

- 2.11 The Director of Clinical Education must have earned at least a baccalaureate degree from an academic institution accredited by a regional or national accrediting agency that is recognized by the U.S. Department of Education (USDE).

Evidence of Compliance:

- Academic transcript denoting the degree earned.

- 2.12 The Director of Clinical Education must have a minimum of four (4) years experience as a Registered Respiratory Therapist; of which at least two (2) years must include clinical respiratory care.² The Director of Clinical Education must have a minimum of two (2) years experience teaching in an accredited respiratory care program either as an appointed faculty member or as a clinical preceptor.

Evidence of Compliance:

- Personnel records, including a curriculum vitae.

- 2.13 The Director of Clinical Education must have regular and consistent contact with students, faculty, and clinical affiliates regardless of program location.

Evidence of Compliance:

- Results of student course evaluations.

Medical Director

- 2.14 The program must appoint a Medical Director to provide and ensure direct physician interaction and involvement in student education in both the clinical and non-clinical settings; the Medical Director must be a Board certified, licensed physician, credentialed at one of its clinical affiliates, with recognized qualifications, by training and/or experience, in the management of respiratory disease and in respiratory care practices.

Evidence of Compliance:

- Curriculum Vitae;
- Appointment Letter/Contractual Agreement;
- Schedules of physician teaching interaction with students;
- Results of annual program resource assessment as documented in the CoARC resource assessment matrix.

Instructional Faculty

- 2.15 In addition to the key personnel, there must be sufficient faculty to provide effective instruction in the didactic, laboratory, and clinical setting. In clinical rotations, the student to faculty ratio cannot exceed 6:1.

² Programs accredited prior to 06/01/2010 will be held to this Standard only when a new director of clinical education is appointed.

Evidence of Compliance:

- Results of annual program resource assessment as documented in the CoARC resource assessment matrix;
- Institutional student surveys of instruction (e.g., course evaluation);
- Course class lists and faculty teaching schedules.

- 2.16 Instructors must be appropriately credentialed for the content areas they teach, knowledgeable in subject matter through training and experience, and effective in teaching their assigned subjects.

Evidence of Compliance:

- Results of annual program resource assessment as documented in the CoARC resource assessment matrix;
- Institutional student surveys of instruction (e.g., course evaluations);
- Faculty curriculum vitae.

Administrative Support Staff

- 2.17 There must be sufficient administrative and clerical support staff to meet the program's goals and objectives as defined in Standard III.

Evidence of Compliance:

- Results of annual program resource assessment as documented in the CoARC resource assessment matrix.

III. PROGRAM GOALS, OUTCOMES, AND ASSESSMENT

Statement of Program Goals

- 3.01 The program must have the following goal defining minimum expectations: “To prepare graduates with demonstrated competence in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains of respiratory care practice as performed by registered respiratory therapists (RRTs).” For programs offering the polysomnography option, the program must have the following additional goal defining minimum expectations: “To prepare sleep disorder specialists with demonstrated competence in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains of polysomnography practice as performed by sleep disorder specialists (SDS).”

Evidence of Compliance:

- Published program goals in program promotional materials, student handbook, advisory committee minutes, CoARC annual Report of Current Status, and/or other locations.

- 3.02 The program goals must form the basis for program planning, implementation and evaluation. Program goals with measurable outcomes must be reviewed annually by program personnel to ensure compatibility with the mission of the sponsoring educational institution.

Evidence of Compliance:

- Documentation that the program’s goals are compatible with the sponsoring institution’s mission;
- Documentation of the program’s outcomes;
- Documentation of annual review of the goals and outcomes by the program personnel, as evidenced in the minutes of faculty meetings.

- 3.03 Program goals must be compatible with nationally accepted standards of roles and functions of registered respiratory therapists and registered sleep disorders specialists for programs offering the polysomnography option.

Evidence of Compliance:

- Documented comparison of program goals and objectives with the periodic job analysis report by the national credentialing agency.

- 3.04 An advisory committee, with representation from each of the communities of interest and key personnel must meet at least annually to assist the program and sponsoring institutional personnel in reviewing and evaluating any changes to educational goals, program outcomes, instructional effectiveness, and program response to change. The communities of interest that are served by the program must include, but are not limited to, students, graduates, faculty, college administration, employers, physicians, and the public.

Evidence of Compliance:

- Current advisory committee membership list identifying the community of interest with which each member is affiliated;
- Minutes and attendance list of advisory committee meetings.

Assessment of Program Goals

- 3.05 The program must formulate a systematic assessment process to evaluate the achievement of its mission, goals and objectives.

Evidence of Compliance:

- Results of the program's annual Report of Current Status, with supporting documentation (NBRC Annual School Summary).

- 3.06 Programs that include distance education components must document and report instructional effectiveness and program outcomes separately for base programs and program options.

Evidence of Compliance:

- Results of student outcome assessments by cohort groups separately for base programs and program options;
- Results of student course and faculty evaluations by cohort groups separately for base programs and program options.

Assessment of Program Resources

- 3.07 The program must, at least annually, assess the appropriateness and effectiveness of the resources described in Standard II. The results of resource assessment must be the basis for ongoing planning and appropriate change. Any deficiency identified in program resources requires development of an action plan, documentation of its implementation, and evaluation of its effectiveness as measured by subsequent ongoing resource assessment.

Evidence of Compliance:

- Results of annual program resource assessment (using the CoARC resource assessment matrix), over sufficient years to document the implementation of action plans and subsequent reevaluations of their effectiveness.

- 3.08 At a minimum, the following components must be documented for each resource assessed: a) Purpose statements; b) Measurement systems; c) Dates of measurement; d) Results; e) Analysis of results; f) Action plans and implementation, and g) Reassessment.

Evidence of Compliance:

- Results of annual program resource assessments (using the CoARC resource assessment matrix), over sufficient years to document the implementation of action plans and subsequent reevaluations of their effectiveness.

Student Evaluation

- 3.09 The program must conduct and document evaluations with sufficient frequency to keep students apprised of their progress toward achieving the curriculum competencies, and to allow immediate identification of learning deficiencies and the development of a means for their remediation in a reasonable time frame.

Evidence of Compliance:

- Student handbook or other documents readily available to students, such as course syllabi, that explains remediation policies and the number and frequency of student evaluations;
- Student evaluations performed by faculty;
- Student evaluations of instruction documenting satisfaction with the frequency of evaluations and opportunities for remediation;
- Records of student academic counseling.

- 3.10 The program must administer evaluations uniformly and equitably to all students in the program for didactic, laboratory, and clinical education components.

Evidence of Compliance:

- Student evaluations performed by faculty, supporting the uniform and equitable administration of the evaluations;
- Student evaluations of instruction documenting satisfaction with the uniform and equitable administration of evaluations.

- 3.11 The program must develop processes that facilitate the development of inter-rater reliability among those individuals who perform student clinical evaluations.

Evidence of Compliance:

- Records of training participation by clinical evaluators;
- Results of a review of student evaluations for the purpose of determining inter-rater reliability.

Assessment of Program Outcomes

- 3.12 Programs must assess their outcomes annually, using standardized CoARC surveys of employers, faculty, students and graduates.

Evidence of Compliance:

- Hard copy or electronic records of completed CoARC survey instruments;

- Results of annual Report of Current Status submitted to CoARC.

3.13 The program must, at a minimum, meet the assessment thresholds established by CoARC for the following program outcomes, regardless of location and instructional methodology used: a) Graduate performance on the national credentialing examination for entry into practice; b) Programmatic retention/attrition; c) Graduate satisfaction with program; d) Employer satisfaction with program; and e) Job placement.

Evidence of Compliance:

- Results of annual Report of Current Status submitted to CoARC.

3.14 Programs not meeting the established CoARC outcomes assessment thresholds must begin a dialogue with CoARC to develop an appropriate plan of action for program improvement that includes addressing the identified shortcomings.

Evidence of Compliance:

- Results of annual Report of Current Status submitted to CoARC;
- Progress reports with supporting documents;

Reporting Program Outcomes

3.15 The program must use the standardized CoARC electronic reporting tool to submit an annual Report of Current Status to CoARC containing its goal(s), learning domains, evaluation systems (including type, cut score, appropriateness, validity, and reliability), outcomes, analysis of the outcomes and an appropriate action plan based on the analysis.

Evidence of Compliance:

- Annual Report of Current Status submitted to CoARC.

Clinical Site Evaluation

3.16 The program must define and maintain consistent and effective processes for the initial and ongoing evaluation of all sites and preceptors used for students' clinical practice experiences. The program must apply comparable evaluation processes to all clinical sites regardless of geographic location.

Evidence of Compliance:

- Program evaluation plan and results of these evaluations for all clinical sites and preceptors;
- Results of student evaluations of clinical courses, sites, and preceptors;
- Results of student and program personnel resource assessment surveys.

IV. CURRICULUM

- 4.01 The program must prepare students to meet the recognized competencies for registered respiratory therapists identified in these standards.

Evidence of Compliance:

- Documentation of competencies encompassing knowledge, technical proficiency, and behaviors expected of program graduates;
- Evaluation mechanisms designed to monitor knowledge, performance, and behavior.

- 4.02 The program must define and list the competencies it requires for graduation. The program must employ student evaluation methods that measure all defined program competencies. These competencies and evaluation methods must be written and communicated to the enrolled students.

Evidence of Compliance:

- Evaluation mechanisms designed to monitor knowledge, performance, and behavior;
- Published materials demonstrating communication of competencies to students.

- 4.03 Written course descriptions, content outlines, including topics to be presented, specific instructional objectives, learning outcomes, and evaluation procedures must be provided to students at the initiation of each respiratory care course.

Evidence of Compliance:

- Written course descriptions, content outlines, including topics to be presented, specific instructional objectives, learning outcomes, and evaluation procedures for each respiratory care course;
- Published materials demonstrating communication of course descriptions, instructional objectives, learning outcomes, and evaluation procedures to students.

Minimum Course Content

- 4.04 The curriculum must include content in the following areas: oral and written communication skills, social/behavioral sciences, biomedical/natural sciences, and respiratory care. This content must be integrated to ensure achievement of the curriculum's defined competencies.

Evidence of Compliance:

- Course syllabi for all respiratory care courses;
- Published curriculum demonstrating appropriate course sequencing;
- Catalog course descriptions for all required courses in the curriculum.

- 4.05 Biomedical/natural sciences content must include human anatomy and physiology, cardiopulmonary anatomy and physiology, cardiopulmonary pathophysiology, chemistry, physics, microbiology, and pharmacology.

Evidence of Compliance:

- Catalog course descriptions for all required biomedical/natural sciences courses.

- 4.06 Respiratory Care content must include respiratory care of the adult, pediatric, and newborn patient; health promotion, education, and disease management; fundamental principles of healthcare reimbursement; fundamental principles of evaluating current scientific literature; medical ethics; provision of health care services to patients with transmissible diseases; provision of services for and management of patients with special needs; community respiratory health; medical emergencies; and legal and ethical aspects of respiratory care practice.

Evidence of Compliance:

- Course syllabus for all respiratory care courses which include course description, learning goals, objectives, methods of evaluation, content outline, and criteria for successful course completion.

- 4.07 Curricular content in the respiratory care must be periodically reviewed and revised to ensure its consistency with the competencies and duties performed by registered respiratory therapists in the workforce, as established by the national credentialing agency through its periodic job analysis and credentialing examination specifications. For the polysomnography option, curricular content must be periodically reviewed and revised to ensure its consistency with the competencies and duties performed by sleep disorder specialists in the workforce, as established by the national credentialing agency through its periodic job analysis and outlined in its credentialing examination specifications. These nationally accepted standards provide the basis for formulating the objectives and competencies of the program's curriculum. A review of the curricular content must be conducted after any revision in the credentialing examination specifications.

Evidence of Compliance:

- Course syllabus for all respiratory care courses which include course description, learning goals, objectives, methods of evaluation, content outline, criteria for successful course completion;
- Written documentation of the comparison of the program curriculum to the most current credentialing exam specifications;
- Annual Report of Current Status submitted to CoARC documenting program outcomes on credentialing examinations.

Minimum Competencies

- 4.08 Graduates must be competent in interpersonal and communication skills to effectively interact with diverse population groups.

Evidence of Compliance:

- Documentation of relevant course content;
- CoARC employer surveys.

4.09 Graduates must be competent in the application of problem solving strategies in the patient care setting.

Evidence of Compliance:

- Summary of course evaluation mechanisms designed to evaluate the student's ability to apply knowledge, perform appropriate patient care, solve problems, and demonstrate appropriate behavior;
- Results of CoARC employer satisfaction surveys.

Length of Study

4.10 The program must ensure that the length of study in the respiratory care program is sufficient for students to acquire the expected knowledge and competencies. The minimum length of the program must be two academic years of full-time instruction or its equivalent.

Evidence of Compliance:

- Annual Report of Current Status submitted to CoARC documenting successful student achievements that meet thresholds;
- Annual Report of Current Status submitted to CoARC documenting the satisfaction of faculty, graduates and employers with the program;
- Published curriculum outline in the academic catalog documenting the length of study required for graduation from the program.

Equivalency

4.11 The program must ensure that course content, learning experiences (didactic, laboratory, and clinical), and access to learning materials are substantially equivalent for each student regardless of location.

Evidence of Compliance:

- Documentation showing that each clinical site, or collection of sites, provides sufficient breadth and depth of clinical exposure to ensure achievement of all clinical competencies;
- Documentation that students at various program locations have access to similar course materials, laboratory equipment and materials, and academic support services;
- Results of student resource assessment surveys.

Clinical Practice

- 4.12 The program must document that clinical education experiences at each clinical site are of sufficient quality and duration to enable students to meet program goals and acquire the competencies needed for clinical practice.

Evidence of Compliance:

- Clinical evaluation mechanisms that document the progressive independence of the student in the clinical setting;
- Clinical syllabi detailing student competencies;
- CoARC graduate and employer surveys;
- Program evaluation plan and results of these evaluations for all clinical sites and preceptors;
- Results of student clinical course, site, and preceptor evaluations;
- Results of student and program personnel resource assessment surveys.

V. FAIR PRACTICES AND RECORDKEEPING

Disclosure

- 5.01 Web pages, academic catalogs, publications and advertising must accurately reflect each respiratory care program offered.

Evidence of Compliance:

- Published program information documenting the program(s) offered.

- 5.02 At least the following must be defined, published, and readily available to all prospective and enrolled students:

- a) The sponsor's institutional and programmatic accreditation status, including the name and contact information of the accrediting agencies.
- b) Admissions and transfer policies.
- c) Requirements for prior education or work experience.
- d) Policies regarding advanced placement.
- e) Required academic and technical standards.
- f) Requirements for completion of each segment of the program.
- g) All graduation requirements.
- h) Academic calendar.
- i) Academic credit required for program completion.
- j) Estimates of tuition, fees and other costs related to the program.
- k) Policies and procedures for student withdrawal, probation, suspension, and dismissal.
- l) Policies and procedures for refunds of tuition and fees.
- m) Policies that may allow students to work in clinical settings outside of formal educational activities outlined in the curriculum.
- n) Policies and procedures for processing student grievances.

Evidence of Compliance:

- Published program information related to a-n above.

- 5.03 A link to the CoARC website, or published URL, where student/graduate outcomes for all programs can be found must appear on the program's website and be available to the public and to all applicants.

Evidence of Compliance:

- Screenshot of program's website showing link.

Non-discriminatory Practice

- 5.04 All activities associated with the program, including student and faculty recruitment, student admission, and faculty employment practices, must be non-discriminatory and in accord with federal and state statutes, rules, and regulations.

Evidence of Compliance:

- Program non-discriminatory policies.
- Program's technical standards.

5.05 Appeal procedures must include provisions for academic and non-academic types of grievances and a mechanism for neutral evaluation that ensures due process and fair disposition.

Evidence of Compliance:

- Program's appeal policy and procedures.

5.06 There must be a faculty grievance procedure made known to all faculty.

Evidence of Compliance:

- Institutional faculty grievance policy and procedures.

5.07 All personnel and student policies must be consistent with federal and state statutes, rules, and regulations.

Evidence of Compliance:

- Academic catalog;
- Program's policies and procedures.

5.08 Admission of students must be made in accordance with clearly defined and published practices of the institution and program.

Evidence of Compliance:

- Academic catalog and other published materials;
- Admission pre-requisites and rationale;
- Admission policies and procedures, including minimal technical standards.

5.09 The program must secure formal written, duly executed agreements with all clinical education sites for students and must designate preceptors for students at each site; the program shall not require students to secure their own clinical education sites or preceptors for required clinical rotations.

Evidence of Compliance:

- Detailed clinical schedules;
- Formal written affiliation agreements.

5.10 Programs granting advanced placement must document that students receiving advanced placement have: a) Met program-defined criteria for such placement; b) Met institution-defined criteria for such placement, and c) Demonstrated appropriate competencies for the curricular components in which advanced placement is given.

Evidence of Compliance:

- Program's policies and procedures related to advanced placement;
- Student advanced placement and course equivalency documentation.

Safeguards

- 5.11 The health and safety of patients, students, and faculty associated with the educational activities and learning environment of the students must be adequately safeguarded.

Evidence of Compliance:

- Affiliate contracts/agreements;
- Published institutional and programmatic policies.

- 5.12 Students must not be used to substitute for clinical, instructional, or administrative staff.

Evidence of Compliance:

- Results of student course evaluations;
- Work study contracts;
- Program policies and procedures with reference to the clinical sites.

- 5.13 Students must not complete clinical coursework while in an employee status at a clinical affiliate. Students shall not receive any form of remuneration in exchange for work they perform incident to their clinical education coursework and experiences.

Evidence of Compliance:

- Program's policies and procedures.

Academic Guidance

- 5.14 The program must ensure that guidance is available to assist students in understanding and abiding by program policies and practices.

Evidence of Compliance:

- Program orientation documentation;
- Program's policies and procedures.

- 5.15 Students must have access to the academic support services that are provided to other students in the institution.

Evidence of Compliance:

- Academic catalog;
- Student manuals;

- Clinical policies and procedures for students;
- Advisement meetings with students;
- Documented Health Insurance Portability and Accountability Act of 1996 (HIPAA) training.

5.16 The program must ensure that students have timely access to faculty for assistance and counseling regarding their academic concerns and problems.

Evidence of Compliance:

- Program/institutional policies and procedures;
- Documentation of counseling sessions;
- Faculty office hours schedules.

Student Identification

5.17 The program must ensure that students are clearly identified as such in the clinical setting to distinguish them from clinical site employees and other health profession students.

Evidence of Compliance:

- Policies governing the wearing of identification badges and appropriate identification of students (by badge and by personal interaction and introduction) in every clinical setting.

Student Records

5.18 Records must be securely maintained for student admission, advisement, counseling, and evaluation. Grades and credits for courses must be recorded on the student transcript and permanently maintained by the sponsor in a safe and accessible location.

Evidence of Compliance:

- Program/institutional policies and procedures;
- Hard copy or electronic student records;
- Description of procedure, including location, for maintaining security of records.

5.19 Records of student evaluations must be maintained in sufficient detail to document learning progress, deficiencies and achievement of competencies. These records must remain on file (in electronic or hard-copy format) for at least five (5) years regardless of whether the student ultimately completes or fails to complete all requirements for graduation.

Evidence of Compliance:

- Hard copy or electronic student records.

- 5.20 Student records kept by the institution must include the following documentation:
- a) That the student has met published admission criteria;
 - b) Student evaluations (see 5.19);
 - c) Records of remediation;
 - d) Records of disciplinary action;
 - e) Official transcripts.

Evidence of Compliance:

- Hard copy or electronic student records.

Program Records

- 5.21 Program records (as defined in 5.22) must be maintained in sufficient detail to document program resources and achievement of program goals and outcomes. These records must be kept for a minimum of five (5) years.

Evidence of Compliance:

- Program/institutional policies and procedures;
- Hard copy or electronic student records.

- 5.22 Program records kept by the institution must include the following documentation:
- a) Annual Report of Current Status and supporting documentation;
 - b) Course syllabi;
 - c) Resource assessment surveys;
 - d) Clinical Affiliate Agreements and schedules;
 - e) Advisory Committee minutes.

Evidence of Compliance:

- Hard copy or electronic copy of 5.22 a-e.

INITIATION AND MAINTENANCE OF ACCREDITATION

Applying for Accreditation

- A.01 The accreditation review process conducted by the CoARC can be initiated only at the written request of the chief executive officer or an officially designated representative of the sponsoring institution. This process is initiated by requesting a CoARC Accreditation Services Application from:

Commission on Accreditation for Respiratory Care
1248 Harwood Road
Bedford, TX 76021-4244
Tel: (817) 283-2835
Fax: (817) 354-8519

The CoARC Accreditation Services Application can also be completed online at www.coarc.com.

- A.02 The accreditation review process includes submission of the Accreditation Services Application, completion and submission of self-study reports, payment of appropriate fees, and agreement to an on-site evaluation.
- A.03 An institution sponsoring a program may voluntarily withdraw from the accreditation process at any time.

Program and Sponsoring Institution Responsibilities

- A.04 In accordance with CoARC policy, failure of a program to meet administrative requirements for maintaining accreditation will result in the program being placed on Administrative Probation and, if not corrected as directed by the CoARC, ultimately to an accreditation action of Withdrawal of Accreditation.
- A.05 The program must inform the CoARC within 30 days of the date of notification of any adverse accreditation action (probation, withdrawal of accreditation) received from the sponsoring institution's regional or national accrediting agency.
- A.06 The program must agree to periodic comprehensive review that may include a site visit as determined by the CoARC.
- A.07 The program must submit self-study reports or progress reports as required by the CoARC.
- A.08 The program must inform the CoARC in writing of changes in the key personnel or other substantive changes in the program (see Standard 1.08) within 15 days of the date of the effective change.

- A.09 The program must obtain the CoARC approval four months prior to implementing any intended program expansion to a satellite campus.
- A.10 The sponsoring institution must inform the CoARC in writing of the intent to transfer program sponsorship as soon as it begins considering transfer.
- A.11 The program and the sponsoring institution must pay CoARC accreditation fees as determined by the CoARC.

APPENDIX B

Interview Guide 1 –Clinical Instructors

Demographic and Background Questions

1. Are you a clinical instructor for an associate degree program or bachelor degree program?
2. How long have you been a clinical instructor?
3. Have you served as a clinical instructor for a different patient population/area?
4. How long is your NICU/PICU rotation (Days, hours, etc.)?

Core Questions

5. What are your perceptions of the NICU/PICU clinical rotation?
 - a. Prompt statements: describe the strengths; weaknesses, describe the learning environment.
6. What are your perceptions of the NICU/PICU clinical students?
 - a. Prompt statements: describe the strengths; weaknesses
7. What are your perceptions of the NICU/PICU clinical site?
 - a. Prompt statements: describe the patient interaction, frequency of interaction, type of interaction, skills and therapies practiced.
8. Are there any questions that you would ask regarding this topic?
9. Is there anything else you would like to add or would be helpful for me to understand about the NICU/PICU clinical experience?
10. Do you have any questions to ask of me?

APPENDIX C

Interview Guide 2 –Directors of Clinical Education

Demographic and Background Questions

1. What clinical experiences do you require prior to the NICU/PICU rotation?
2. Do you offer a combined or separate NICU/PICU rotation?
3. How long is your NICU/PICU rotation (Days, hours, etc.)?
4. Please describe your NICU/PICU clinical instructors:
 - a. Supplied by the RC program?
 - b. Supplied by the hospital?
 - i. Dedicated to your clinical rotation?
 - ii. Hospital employee with an assignment?
 - iii. Hospital NICU educator?
5. How does your RC program prepare students for the NICU/PICU rotation?
 - a. Simulation experiences?
 - b. Didactic course?
 - c. Lab experiences?

Core Questions

6. What are your perceptions of the NICU/PICU clinical rotation?
 - a. Prompt statements: describe the strengths; weaknesses; describe the learning environment.
7. What are your perceptions of the NICU/PICU clinical instructor/preceptor experience?
 - a. Prompt statements: describe the strengths; weaknesses
8. What are your perceptions of the NICU/PICU clinical site?
 - a. Prompt statements: describe the patient interaction, frequency of interaction, type of interaction, skills and therapies practiced.
9. Are there any questions that you would ask regarding this topic?
10. Is there anything else you would like to add or would be helpful for me to understand about the NICU/PICU clinical experience?
11. Do you have any questions to ask of me?

APPENDIX D

Interview Guide 3 –Students

Demographic and Background Questions

1. What were your clinical experiences prior to the NICU/PICU rotation?
2. Did you have a combined or separate NICU/PICU rotation?
3. How long was your NICU/PICU rotation (Days, hours, etc.)?
4. How did the RC program prepare you for the NICU/PICU rotation?
 - a. Simulation experiences?
 - b. Didactic course?
 - c. Lab experiences?
5. Did you have a clinical instructor:
 - a. Supplied by the RC program?
 - b. Supplied by the hospital?
 - i. Dedicated to your clinical rotation?
 - ii. Hospital employee with an assignment?
 - iii. Hospital NICU educator?

Core Questions

6. What are your perceptions of the NICU/PICU clinical rotation?
 - a. Prompt statements: describe the strengths and weaknesses, describe the learning environment.
7. What are your perceptions of the NICU/PICU clinical site?
Prompt statements: describe your patient interaction; how often it occurred, type of interaction, trust level for a student, the variety of skills training.
8. At the conclusion of the rotation, how did you perceive your neonatal and pediatric clinical skills? Knowledge?
9. Are there any questions that you would ask regarding this topic?
10. Is there anything else you would like to add or would be helpful for me to understand about the NICU/PICU clinical experience?
11. Do you have any questions to ask of me?

APPENDIX E

Consent Form

Chris Russian, a Ph.D. student at Texas State University-San Marcos is conducting a research project titled *A qualitative study to determine perceptions of neonatal and pediatric clinical education in an allied health profession*. This research project is required to complete his dissertation and Ph.D. degree. Chris can be contacted by phone (512-245-3794) or email (cr23@txstate.edu). The dissertation committee includes: Dr. Steve Furney, Committee Chair, and Dr. Jovita Ross-Gordon, Dr. Robert Reardon, and Dr. Gregg Marshall. All committee members are faculty at Texas State University-San Marcos and may be reached by calling the Education Department at 512-245-3083.

You are invited to participate in a research project. This research has received Institutional Review Board (IRB) approval by Texas State University-San Marcos. IRB Number: EXP2012A9782

Purpose of the research:

The purpose of this research is to determine the strengths and weaknesses of the neonatal and pediatric clinical rotation. The researcher wants to know how to improve the clinical rotation. I want to know your thoughts on the neonatal and pediatric clinical rotation. I hope to find strengths and weaknesses of the neonatal and pediatric clinical rotation so I can report these findings in my dissertation.

Your participation:

You have been chosen because of your respiratory therapy involvement. You are a respiratory care student, a clinical instructor or a director of clinical education.

Your requirement:

This research study involves me interviewing you. I have 11 questions to ask you during the interview. I can give you a copy of the questions if you would like. The interview will last about 60 to 90 minutes. I will ask you to share your thoughts on the neonatal and pediatric clinical rotation. I also want to know your background in the respiratory therapy program. The researcher may need to contact you by email if follow-up or clarification is needed. The interview and email follow-up are the only procedures for this research. There are no alternative procedures to completing this research.

Benefits:

It is believed that the interviews will inform the respiratory care community of the strengths and weaknesses of the neonatal and pediatric clinical rotations. This information could lead to changes that benefit the respiratory care student, program and patients treated by respiratory therapists.

Risks:

There are no anticipated physical or psychological risks associated with this research. You may refuse to answer any questions if you do not feel comfortable providing an answer.

Financial Incentive:

You will receive a \$50.00 incentive for completing the interview.

Voluntary Participation:

You are volunteering to participate in this project. You can withdraw from this study at any time. Your withdrawal will not jeopardize your standing with the researcher or with your institution. You may also refuse to answer any question I ask during the interview.

Confidentiality:

Your information will remain confidential with no link to your educational program.

Your identity will only be known to the researcher. If you agree to participate the researcher will give you a code name that will be written on your interview transcript and the researchers notes. The list matching your name with your code name will remain in a locked file cabinet. Once data collection has been finalized this list will be shredded.

Your code name will be used on statements shared with the dissertation committee and anyone outside the study. All written and audio data will be stored in a locked file cabinet in the researcher's office. These data will be stored for five years and then destroyed.

A copy of the study results will be shared with you if desired.

Additional questions about the research and your rights should be directed to the IRB chair, Dr. Jon Lasser (512-245-3413 – lasser@txstate.edu), or to Ms. Becky Northcut, Compliance Specialist (512-245-2102).

Participant Signature

Date

Researcher Signature

Date

APPENDIX F

Competencies from *2015 and Beyond* Project.

Competency Area I: Diagnostics*	
Descriptor	Definition
A. Pulmonary Function Technology	<ol style="list-style-type: none"> 1. Perform basic spirometry, including adequate coaching, recognition of improperly performed maneuvers, corrective actions, and interpretation of test results. 2. Compare and evaluate indications and contraindications for advanced pulmonary function tests (plethysmography, diffusion capacity, esophageal pressure, metabolic testing, and diaphragm stimulation) and be able to recognize normal/abnormal results.
B. Sleep	<ol style="list-style-type: none"> 1. Compare and evaluate the indications and contraindications for sleep studies. 2. Understand results in relation to types of respiratory sleep disorders.
C. Invasive Diagnostic Procedures	<ol style="list-style-type: none"> 1. Explain the indications and contraindications, and general hazards and complications of bronchoscopy. 2. Describe the bronchoscopy procedure and describe the respiratory therapist's role in assisting the physician. 3. Monitor and evaluate the patient's clinical condition with pulse oximetry, electrocardiogram, exhaled gas analysis, and other related diagnostic devices. 4. Perform arterial puncture and sampling and blood analysis.
Competency Area II: Disease Management*	
Descriptor	Definition
A. Chronic Disease Management	<ol style="list-style-type: none"> 1. Understand the etiology, anatomy, pathophysiology, diagnosis, and treatment of cardiopulmonary diseases (e.g., asthma, chronic obstructive pulmonary disease) and comorbidities. 2. Communicate and educate to empower and engage patients. 3. Develop, administer, and re-evaluate the care plan: <ol style="list-style-type: none"> a. Establish specific desired goals and objectives. b. Evaluate the patient. c. Apply a working knowledge of the pharmacology of all organ systems. d. Provide psychosocial, emotional, physical, and spiritual care.

	<ul style="list-style-type: none"> e. Education on nutrition, exercise, wellness. f. Environmental assessment and modification. g. Monitoring and follow-up evaluation. h. Development of action plans. i. Apply evidence-based medicine, protocols, and clinical practice guidelines. j. Monitor adherence through patient collaboration and empowerment, including proper and effective device and medication utilization. k. Implement and integrate appropriate patient-education materials and tools. l. Utilize appropriate diagnostic and monitoring tools. m. Document and monitor outcomes (economic, quality, safety, patient satisfaction). n. Communicate, collaborate, and coordinate with physicians, nurses, and other clinicians. o. Assess, implement, and enable patient resources support system (family, services, equipment, personnel). p. Ensure financial/economic support of plan/program and related documentation.
B. Acute Disease Management	<ul style="list-style-type: none"> 1. Develop, administer, evaluate, and modify respiratory care plans in the acute-care setting, using evidence-based medicine, protocols, and clinical practice guidelines. 2. Incorporate the patient/therapist participation principles listed in chronic disease management (see IIA.).
Competency Area III: Evidence-Based Medicine and Respiratory Care Protocols*	
Descriptor	Definition
A. Evidence-Based Medicine	<ul style="list-style-type: none"> 1. Review and critique published research. 2. Explain the meaning of general statistical tests. 3. Apply evidence-based medicine to clinical practice.
B. Respiratory Care Protocols	<ul style="list-style-type: none"> 1. Explain the use of evidence-based medicine in the development and application of hospital-based respiratory care protocols. 2. Evaluate and treat patients in a variety of settings, using the appropriate respiratory care protocols.
Competency Area IV: Patient Assessment	
Descriptor	Definition
A. Patient Assessment	<ul style="list-style-type: none"> 1. Complete the assessment through direct contact, chart review, and other means as appropriate, and share the information with healthcare team members.

	<ul style="list-style-type: none"> 2. Obtain medical, surgical, and family history. 3. Obtain social, behavioral, and occupational history, and other historical information incident to the purpose of the current complaint.
B. Diagnostic Data	<ul style="list-style-type: none"> 1. Review and interpret pulmonary function studies (spirometry). 2. Review and interpret lung volumes and diffusion studies. 3. Review and interpret arterial blood gases, electrolytes, complete blood cell count, and related laboratory tests.
C. Physical Examination	<ul style="list-style-type: none"> 1. Inspect the chest and extremities to detect deformation, cyanosis, edema, clubbing, and other anomalies. 2. Measure vital signs (blood pressure, heart rate, respiratory rate). 3. Evaluate patient breathing effort, ventilatory pattern, and use of accessory muscles. 4. Measure and document oxygen saturation with oximetry under all appropriate conditions (with or without oxygen at rest and during sleep, ambulation, and exercise).
Competency Area V: Leadership	
Descriptor	Definition
A. Team Member	Understand the role of being a contributing member of organizational teams as it relates to planning, collaborative decision-making, and other team functions.
B. Healthcare Regulatory Systems	Understand fundamental/basic organizational implications of regulatory requirements on the healthcare system.
C. Written and Verbal Communication	Demonstrate effective written and verbal communication with various members of the healthcare team, patients, families, and others (cultural competence and literacy).
D. Healthcare Finance	Demonstrate basic knowledge of health-care and financial reimbursement systems and the need to reduce the cost of delivering respiratory care.
E. Team Leader	Understand the role of team leader: specifically, how to lead groups in care planning, bedside decision making, and collaboration with other healthcare professionals.
Competency Area VI: Emergency and Critical Care*	

Descriptor	Definition
A. Emergency Care	<ol style="list-style-type: none"> 1. Perform basic life support (BLS), advanced cardiovascular life support (ACLS), pediatric advanced life support (PALS), and neonatal resuscitation program (NRP) according to American Heart Association (AHA) guidelines. 2. Maintain current AHA certification in BLS and ACLS. 3. Perform endotracheal intubation. 4. Perform as a member of the rapid response team (medical emergency team). 5. Participate in mass-casualty staffing to provide airway management, manual and mechanical ventilatory life support, medical gas administration, aerosol delivery of bronchodilators and other agents in the resuscitation of respiratory and cardiovascular failure. 6. Provide intra-hospital transport of critically and chronically ill patients, provide cardiopulmonary life support and airway control during transport. 7. Apply knowledge of emergency pharmacology and demonstrate ability to recommend use of pharmacotherapy.
B. Critical Care	<ol style="list-style-type: none"> 1. Apply to practice knowledge, understanding, and analysis of invasive and noninvasive mechanical ventilators. 2. Apply to practice all ventilation modes currently available on all invasive and noninvasive mechanical ventilators, as well as all adjuncts to the operation of modes. 3. Interpret ventilator data and hemodynamic monitoring data, and calibrate monitoring devices. 4. Manage airway devices and sophisticated monitoring systems. 5. Make treatment recommendations based on waveform graphics, pulmonary mechanics, and related imaging studies. 6. Apply knowledge, understanding, and analysis of use of therapeutic medical gases in the treatment of critically ill patients. 7. Apply knowledge and understanding of circulatory gas exchange devices to respiratory therapy practice. 8. Participate in collaborative care management based on evidence-based protocols. 9. Deliver therapeutic interventions based on protocol. 10. Integrate the delivery of basic and/or advanced therapies in conjunction with or without the mechanical ventilator in the care of critically ill patients. 11. Make recommendations and provide treatment to critically ill patients based on pathophysiology. 12. Recommend cardiovascular drugs based on knowledge and understanding of pharmacologic action. 13. Use electronic data systems in practice.

Competency Area VII: Therapeutics*	
Descriptor	Definition
A. Assessment of Need for Therapy	<p>Assess the need for therapies in all patient settings (acute, non-acute):</p> <ol style="list-style-type: none"> 1. Medical gas therapy 2. Humidity therapy 3. Aerosol therapy 4. Hyperinflation therapy 5. Bronchial hygiene therapy 6. Airway management 7. Mechanical ventilation
B. Assessment Prior to Therapy	<ol style="list-style-type: none"> 1. Review order or implement protocol. 2. Review patient history, laboratory results, imaging data. 3. Determine indications for therapy. 4. Interview and conduct physical examination of patient. 5. Determine appropriateness of order. 6. Determine need for physician communication.
C. Administration of Therapy	<ol style="list-style-type: none"> 1. Select and assemble equipment. 2. Apply and administer therapy. 3. Educate and instruct patient. 4. Recognize and rectify equipment malfunction (troubleshooting). 5. Maintain infection control.
D. Evaluation of Therapy	<ol style="list-style-type: none"> 1. Recognize complications and adverse affects. 2. Respond to complications. 3. Recommend therapy modifications. 4. Assess therapy effectiveness. 5. Document therapy.
Competency Area VII: Therapeutics - Application to Respiratory Care Practice*	
Descriptor	Definition
A. Medical Gas Therapy	<p>Apply knowledge, understanding, and troubleshooting skills to gas delivery systems for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. High-pressure cylinders 2. Regulators and flow meters 3. Liquid-oxygen systems (stationary and portable) 4. Oxygen concentrators (stationary and portable) 5. High-flow air-entrainment systems (e.g., Downs flow generator, Caradine Whisper Flow, Maxtec) 6. Oxygen and air-flow-meter mixing systems (requires


	<p>competence in algebra)</p> <ol style="list-style-type: none"> 7. Air/oxygen blenders 8. Hyperbaric oxygen systems 9. Sub-ambient oxygen delivery systems (neonatal only) 10. Nasal cannulas 11. High-flow nasal cannulas (e.g., Vapotherm, Aequinox, Maxtec) 12. Reservoir cannulas 13. Nasal masks 14. Non-reservoir masks 15. Reservoir masks 16. Air-entrainment masks 17. Hood/head-enclosures (neonatal only) 18. Aerosol mist tents 19. Transtracheal oxygen therapy 20. Nitric oxide therapy 21. Helium/oxygen therapy
B. Humidity Therapy	<p>Apply knowledge, understanding, and troubleshooting skills to humidity therapy systems for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. Unheated bubble humidifiers 2. Active and passive heat-and-moisture exchangers (HMEs) 3. Heated humidifiers for medical gas delivery systems via mask or tracheal catheter
C. Aerosol Therapy	<p>Apply knowledge, understanding, and troubleshooting skills to aerosol systems for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. Non-medicated (water/saline): Large-volume pneumatic nebulizers, via mask, T-piece, or tracheostomy collar; heated and unheated 2. For delivery of medication <ol style="list-style-type: none"> a. Small-volume pneumatic nebulizers for nebulization of liquids b. Intermittent c. Breath-actuated d. Nebulizers for bronchial challenge testing 3. Nebulizers for continuous nebulization 4. Ultrasonic nebulizers 5. Pressurized metered-dose inhalers 6. Inhalers and dry-powder inhalers 7. Nebulizers using porous membranes 8. Competency in pharmacology nomenclature, physiologic action, adverse effects, doses: <ol style="list-style-type: none"> a. Adrenergics b. Anticholinergics, cholinergics c. Decongestants, antimicrobials d. Mucolytic/proteolytics

	<p>e. Pulmonary vasodilators</p> <p>9. Peak flow meters and inspiratory flow meters</p> <p>10. Mathematics required: competency in algebraic calculation of and modification of drug dosing:</p> <p>(1) based on weight of patient;</p> <p>(2) conversion of dosing based on mg, mL, and % strength or ratio</p>
D. Hyperinflation Therapy	<p>Apply knowledge, understanding, and troubleshooting skills to hyperinflation equipment for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. Incentive spirometers (flow-based and volume-based) 2. Continuous positive airway pressure (CPAP) devices 3. Expiratory positive airway pressure (EPAP) devices 4. Intermittent positive-pressure breathing devices 5. Manual hyperinflation with bag-valve-mask devices
E. Bronchial Hygiene Therapy	<p>Apply knowledge, understanding, and troubleshooting skills to bronchial hygiene therapy for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. Positioning for bronchial drainage 2. Chest percussion: manual and mechanical percussor 3. Vibratory continuous positive airway pressure (CPAP) 4. Expiratory positive airway pressure (EPAP) devices 5. External chest-wall-vibration devices 6. Assist physician in therapeutic bronchoscopy 7. Intrapulmonary percussive ventilation (IPV) 8. Cough-assist device (insufflator-exsufflator)
F. Airway Management	<p>Apply knowledge, understanding, and troubleshooting skills to airway management for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. Head-tilt chin-lift airway-opening maneuver 2. Oropharyngeal airway 3. Nasopharyngeal airway 4. Face mask and bag-valve-mask 5. Care of oral and nasal endotracheal tubes 6. Competency in advising discontinuance or change to alternative airway based on assessment/protocols 7. Care of tracheostomy tube (competency in advising decannulation or change to alternative airway based on assessment/protocols) 8. Care of tracheostomy “button” or valve 9. Assist physician in placing surgical or percutaneous tracheostomy tube. 10. Suction via artificial airway, operate suction system, select suction catheter.

G. Mechanical Ventilation	<p>Apply knowledge, understanding, and troubleshooting skills to mechanical ventilation for adult, pediatric, and neonatal patients.</p> <ol style="list-style-type: none"> 1. Incorporate the mechanical ventilation principles listed in critical care (see Table 7 VIB) 2. CPAP devices 3. Bi-level positive airway pressure (BiPAP) devices 4. Noninvasive-ventilation interfaces: nasal mask, nasal pillows, oro-nasal mask, full-face mask, helmet.
* Upon entry into the workforce, a graduate respiratory therapist must possess all of these competencies.	

APPENDIX G

National Board for Respiratory Care (NBRC) Neonatal/Pediatric Specialty (NPS) Examination Detailed Content Outline

 Neonatal/Pediatric Specialist Examination Detailed Content Outline	Items				
	Ethics	Cognitive Level			Total
		Recall	Application	Analysis	
Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the Ethics column is open.					
Each shaded cell prevents an item from appearing on an examination.					
I. CRITICAL CARE		6	35	34	75
A. Evaluate Pertinent Information		0	6	6	12
1. Maternal history					
2. Neonatal assessment e.g., • Apgar • fetal lung maturity indices					
3. Patient history					
4. Physical examination					
5. Laboratory e.g., • blood gas analyses • cultures • CBC					
6. Imaging e.g., • chest radiograph • fluoroscopy • cardiac catheterization and • MRI angiography • CT • echocardiography					
7. Other diagnostic results e.g., • transillumination • oxygen challenge test					
B. Assess and Manage Airways		2	6	4	12
1. Establishment of an airway e.g., • bag-mask ventilation • oral/nasal airway placement					
2. Difficult airway recognition					
3. Performing or assisting standard intubation e.g., • equipment selection • CO ₂ verification					
4. Performing or assisting advanced intubation techniques e.g., • cricoid pressure • specialty laryngoscopic • tube changers visualization devices					
5. Artificial airways					
a. laryngeal mask airway					
b. cuff management					
c. tracheostomy tubes					
d. airway clearance techniques e.g., • secretion removal					
C. Administer and Monitor Specialty Gases		0	2	2	4
1. Nitric oxide					
2. Helium-oxygen					

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Neonatal/Pediatric Specialist Examination Detailed Content Outline

Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the *Ethics* column is open.

Each shaded cell prevents an item from appearing on an examination.

	Items			
	Ethics	Cognitive Level		Total
		Recall	Application	
3. Other e.g., • isoflurane • subambient • carbon dioxide				
D. Manage Ventilation and Oxygenation		0	10	15
1. Selection of initial settings				
2. Conventional modes				
3. Alternative modes e.g., • volume-targeted • high frequency • airway pressure • neurally adjusted release ventilation ventilatory assist				
4. Noninvasive e.g., • CPAP • bilevel				
5. Adjunct techniques				
a. lung recruitment maneuvers				
b. prone patient positioning				
c. extracorporeal gas exchange e.g., • ECMO • CO ₂ removal				
6. Monitoring				
a. measures of lung disease severity e.g., • OI • PaO ₂ / F _I O ₂ ratio				
b. airway pressures and volumes e.g., • mean airway pressure • minute ventilation				
c. gas exchange e.g., • S _F O ₂ • ETCO ₂				
d. ventilator waveforms				
e. ventilator-patient interaction e.g., • synchrony				
f. pulmonary mechanics e.g., • compliance • V _D / V _T • resistance • MIP				
g. effects of mechanical ventilation on cardiac function				
7. Strategies				
a. liberation from mechanical ventilation e.g., • protocols • spontaneous breathing trials				
b. prevention of ventilator induced lung injury				

 Neonatal/Pediatric Specialist Examination Detailed Content Outline	Items			
	Ethics	Cognitive Level		
		Recall	Application	Analysis
Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the <i>Ethics</i> column is open.				
Each shaded cell prevents an item from appearing on an examination.				
c. lung-protective ventilation e.g., • permissive hypercapnea				
8. Optimizing patient-ventilator interaction				
E. Prevent Ventilator Associated Pneumonia		1	1	1
1. Oral care				
2. Bed position				
3. Minimizing intubation time e.g., • determining extubation readiness • noninvasive positive pressure ventilation				
4. Ventilator circuit care e.g., • closed suction • heated wire				
F. Select, Assemble, and Troubleshoot Equipment		2	4	2
1. Oxygen administration devices e.g., • high-flow nasal cannula • oxygen hood				
2. Aerosol delivery devices e.g., • continuous medication nebulizers • in-line administration				
3. Nitric oxide delivery devices				
4. Transcutaneous monitoring systems				
5. Mechanical ventilators				
G. Assist or Perform Procedures		0	3	2
1. Inter- or Intra-hospital transport				
2. Intravascular catheter insertion e.g., • through an umbilical or peripheral site				
3. Bronchoscopy and associated procedures e.g., • lavage • brush • biopsies				
4. Intubation				
5. Extubation				
H. Deliver Pharmacologic Agents		0	2	1
1. Aerosolized agents e.g., • antimicrobials • bronchodilators • mucolytics • anti-inflammatories • vasodilators				
2. Airway instillations e.g., • surfactant replacement therapy • lidocaine				





Neonatal/Pediatric Specialist Examination Detailed Content Outline

Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the *Ethics* column is open.

Each shaded cell prevents an item from appearing on an examination.

	Ethics	Items		
		Cognitive Level		Total
		Recall	Application	
I. Assist or Perform Resuscitation		1	1	1
1. Selection of appropriate equipment e.g.,				
• T-piece resuscitator				
• flow-inflating resuscitation bag				
2. Following the appropriate protocol e.g.,				
• NRP • PALS				
II. GENERAL CARE		3	26	16
A. Assess Patient Status and Changes in Status		0	7	5
1. Specific airway challenges e.g.,				
• acute upper airway obstruction				
• congenital anomalies				
2. Chest imaging e.g.,				
• radiograph • CT				
3. Indices of respiratory physiology and mechanics e.g.,				
• oxygenation • sleep study results				
• work of breathing				
4. Neurologic e.g.,				
• respiratory function • level of consciousness				
• apnea of prematurity				
5. Cardiovascular e.g.,				
• physical assessment • pulmonary hypertension				
• hemodynamics • congenital heart disease				
6. Recognition of respiratory failure mechanisms				
a. primary pulmonary and airway diseases e.g.,				
• atelectasis • asthma				
• pneumonia • croup				
b. other e.g.,				
• neuromuscular • flail chest				
• respiratory control				
7. Renal, metabolic, endocrine, and nutrition e.g.,				
• fluid status • acid-base balance				
• electrolytes • inborn errors of metabolism				
• nutrition/feeding • diabetic ketoacidosis				
8. Gastrointestinal e.g.,				
• congenital anomalies • feeding tube placement				
• abdominal distension • necrotizing enterocolitis				

 Neonatal/Pediatric Specialist Examination Detailed Content Outline	Items			
	Ethics	Cognitive Level		
		Recall	Application	Analysis
Total				
Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the <i>Ethics</i> column is open. Each shaded cell prevents an item from appearing on an examination.				
9. Musculoskeletal e.g., • spinal cord injury • scoliosis • myopathy • myelomeningocele				
B. Select, Assemble, and Troubleshoot Equipment		1	5	4
1. Airway clearance devices e.g., • In-exsufflator • high frequency chest oscillation				
2. Oxygen administration devices e.g., • high-flow nasal cannula • oxygen hood				
3. Aerosol delivery devices				
4. Mechanical ventilators e.g., • home				
C. Anticipate Care Based on Laboratory Results and Nutritional Status		0	4	2
1. Hematologic e.g., • CBC • Hgb electrophoresis				
2. Chemistry e.g., • electrolytes • glucose • albumin				
3. Microbiology e.g., • RSV swab • culture • Gram stain				
4. Blood gas analyses and hemoximetry (co-oximetry)				
5. Complications of feedings e.g., • intolerance • malplacement of feeding tube • aspiration				
D. Anticipate Care Based on Imaging and Reports of Imaging		0	1	1
1. Radiographs				
2. Other e.g., • CT • Ultrasound • MRI				
E. Anticipate Effects of Pharmacologic Agents		2	3	2
1. Sedatives, hypnotics, and analgesia				
2. Neuromuscular blocking agents e.g., • succinylcholine • cisatracurium				

 Neonatal/Pediatric Specialist Examination Detailed Content Outline	Items			
	Ethics	Cognitive Level		Total
		Recall	Application	
Each open cell shows an examination could include an item from the indicated cognitive level, which could interact with the ethics domain when the cell in the <i>Ethics</i> column is open.				
Each shaded cell prevents an item from appearing on an examination.				
3. Reversal agents e.g., • naloxone • neostigmine • flumazenil				
4. Vasoactive and inotropic agents				
5. Diuretics				
6. Aerosolized agents e.g., • bronchodilators • antimicrobials • anti-inflammatories • mucolytics				
7. Drug interactions				
8. Influence of co-morbid conditions e.g., • renal failure • hepatic failure				
F. Manage End-of-Life Care		0	1	1
1. Differentiation of the potential need for end-of-life care e.g., • palliative • hospice				
2. Withdrawal of life support				
3. Care of organ donors				
G. Prepare for Disasters		0	2	0
1. Procedures for patient movement and protection				
2. Triage procedures				
3. Equipment and supply management				
H. Interact with Members of an Interdisciplinary Team		0	1	1
1. Suggested modifications to the care plan based on the respiratory assessment				
2. Responses to proposed care plan modifications from other team members				
I. Evaluate Patient and Family Understanding of Education		0	2	0
1. Discharge and home e.g., • tracheostomy care • CPR • monitoring				
2. Equipment and procedure instruction				
3. Medication administration				
Totals	3*	9	61	50
				120

* Each test form will include 3 items that engage thinking about ethics to select the best answer.

Each of these 3 items also will

- include content from a task that shows an open cell under the *Ethics* column.
- be written to a cognitive level permitted for the task to which the item is linked.

Secondary Test Specifications

Item content also will be classified by the condition or disorder described for each patient

Conditions or Disorders	Item Counts Across the Examination		
	Target	Acceptable Range for Each Test Form	
	120	Minimum	Maximum
General			
<i>No specific condition or disorder</i>	30	24	36
Asthma	10	8	12
Prematurity acute phase e.g., surfactant deficiency, apnea	10	8	12
Infectious diseases e.g., pneumonia, croup	10	8	12
Neonatal pulmonary e.g., meconium aspiration, pneumonia, PPHN	10	8	12
Chronic lung disease of prematurity	7	6	8
Bronchiolitis	7	6	8
Congenital heart diseases	4	3	5
Congenital defects that require surgical correction	4	3	5
Neuromuscular e.g., spinal muscle atrophy, muscular dystrophy	4	3	5
Shock	4	3	5
Trauma	4	3	5
Cystic fibrosis	4	3	5
Pediatric airway e.g., tracheomalacia, vocal cord paralysis, vascular ring	4	3	5
Neurologic e.g., seizures, brain tumors, hydrocephalus	3	2	4
Immunocompromised	2	2	2
Heart failure	2	2	2
Inhalation injuries	1	0	1
Total	120		

Each new test form will include two 20-item pretests (e.g., 1A, 1B, 2A, 2B) that will be released in sequence. The A set will be used for the first half of the test form cycle followed by the B set.

APPENDIX H

National Board for Respiratory Care, Clinical Simulation Examination Detailed Content Outline

Effective Date: 01-01-2010

Effective Date: 07-01-2010

Clinical Simulation Examination Detailed Content Outline

I. PATIENT DATA EVALUATION AND RECOMMENDATIONS

A. Review Data in the Patient Record

1. Patient history e.g.,
 - present illness
 - admission notes
 - respiratory care orders
 - medication history
 - progress notes
 - diagnoses
 - DNR status
 - patient education (previous)
2. Physical examination relative to the cardiopulmonary system e.g., vital signs, physical findings
3. Laboratory data e.g.,
 - CBC
 - electrolytes
 - coagulation studies
 - culture and sensitivities
 - sputum Gram stain
4. Pulmonary function results
5. Blood gas results
6. Imaging studies e.g.,
 - radiograph
 - CT
 - MRI
7. Monitoring data
 - a. fluid balance
 - b. pulmonary mechanics e.g., maximum inspiratory pressure, vital capacity
 - c. respiratory e.g.,
 - rate
 - tidal and minute volume
 - I:E
 - d. pulmonary compliance, airways resistance, work of breathing
 - e. noninvasive e.g.,
 - pulse oximetry
 - V_D/V_T
 - capnography
 - transcutaneous O_2 / CO_2
8. Cardiac monitoring
 - a. ECG data results e.g., heart rate, rhythm
 - b. hemodynamic monitoring results e.g.,
 - blood pressure
 - CVP
 - PA pressure
 - cardiac output / index
9. Maternal and perinatal / neonatal history and data
 - Apgar scores
 - gestational age
 - L / S ratio
10. Sleep study results e.g., diagnosis, treatment



Clinical Simulation Examination Detailed Content Outline

B. Collect and Evaluate Additional Pertinent Clinical Information

1. Assess a patient's overall cardiopulmonary status by **inspection** to determine

- a. general appearance e.g.,
 - venous distention
 - edema
 - accessory muscle activity
 - chest wall movement
 - diaphoresis
 - clubbing
 - cyanosis
 - breathing pattern

b. airway assessment e.g., macroglossia, neck range of motion

c. cough, sputum amount and character

d. Apgar score, gestational age, transillumination of chest

2. Assess a patient's overall cardiopulmonary status by **palpation** to determine

a. pulse, rhythm, force

b. asymmetrical chest movements, tactile fremitus, crepitus, tenderness, secretions in the airway, and tracheal deviation

3. Assess a patient's overall cardiopulmonary status by **percussion**

4. Assess a patient's overall cardiopulmonary status by **auscultation** to determine presence of

a. breath sounds

b. heart sounds and rhythm

c. blood pressure

5. Interview a patient to determine

a. level of consciousness and orientation, emotional state, and ability to cooperate

b. level of pain

c. presence of dyspnea, sputum production, and exercise tolerance

d. nutritional status

e. social history e.g., smoking, substance abuse

f. advance directives e.g., DNR status

6. Assess a patient's learning needs

7. Review a chest radiograph to determine

a. quality of imaging e.g., patient positioning, exposure

b. position of endotracheal or tracheostomy tube

c. presence of, or change in, cardiopulmonary abnormalities e.g.,

- pneumothorax
- consolidation
- pleural fluid
- pulmonary edema

d. position of indwelling tubes and catheters

e. presence of foreign bodies

f. position of or change in hemidiaphragms or mediastinum

8. Review lateral neck radiographs e.g., epiglottitis, foreign body

9. Perform procedures

a. 12-lead ECG

b. transcutaneous monitoring

c. pulse oximetry and capnography



Clinical Simulation Examination Detailed Content Outline

d. tidal volume, minute volume, vital capacity, and peak flow measurements
e. bedside spirometry e.g., FVC, FEV ₁
f. arterial sampling - percutaneous or line
g. arterialized capillary blood sampling
h. timed walk test e.g., 6-minute
i. oxygen titration with exercise
j. blood gas / hemoximetry analysis
k. exhaled nitric oxide
l. cardiopulmonary calculations e.g., $P(A-a)O_2$, V_D / V_T
m. hemodynamic monitoring e.g., blood pressure, CVP
n. lung mechanics e.g., <ul style="list-style-type: none"> • plateau pressure • airways resistance • MIP • compliance • MEP
o. ventilator graphics e.g., pressure / volume loop
p. apnea monitoring
q. overnight pulse oximetry
r. tracheal tube cuff pressure and / or volume
s. arterial line insertion
t. stress testing e.g., ECG, pulse oximetry
u. pulmonary function laboratory studies
v. CPAP / BIPAP titration during sleep
w. auto-PEEP detection
10. Interpret procedure results including
a. 12-lead ECG e.g., <ul style="list-style-type: none"> • rate • artifacts • irregular rhythm
b. transcutaneous monitoring
c. pulse oximetry and capnography
d. tidal volume, minute volume, vital capacity, and peak flow measurements
e. bedside spirometry e.g., FVC, FEV ₁
f. arterial sampling - percutaneous or line
g. arterialized capillary blood sampling
h. timed walk test e.g., 6-minute
i. oxygen titration with exercise
j. blood gas / hemoximetry analysis
k. exhaled nitric oxide
l. cardiopulmonary calculations e.g., $P(A-a)O_2$, V_D / V_T
m. hemodynamic monitoring e.g., blood pressure, CVP
n. lung mechanics e.g., <ul style="list-style-type: none"> • plateau pressure • MEP • MIP
o. ventilator graphics e.g., pressure/volume loop



Clinical Simulation Examination Detailed Content Outline

p. apnea monitoring
q. overnight pulse oximetry
r. tracheal tube cuff pressure and/or volume
s. arterial line insertion
t. stress testing e.g., ECG, pulse oximetry
u. pulmonary function laboratory studies
v. CPAP / BIPAP titration during sleep
w. auto-PEEP detection
C. Recommend Procedures to Obtain Additional Data
1. Blood tests e.g., hemoglobin, potassium
2. Radiographic and other imaging studies
3. Diagnostic bronchoscopy e.g., evaluate hemoptysis, atelectasis
4. Sputum Gram stain, culture and sensitivities e.g., pneumonia
5. Bronchoalveolar lavage (BAL)
6. Pulmonary function testing
7. Lung mechanics e.g., compliance, airways resistance
8. Blood gas analysis, pulse oximetry, and transcutaneous monitoring
9. ECG
10. Capnography
11. Hemodynamic monitoring e.g., blood pressure, CVP
12. Insertion of monitoring catheters e.g., arterial
13. Sleep studies
14. Thoracentesis e.g., pleural effusion
II. EQUIPMENT MANIPULATION, INFECTION CONTROL, AND QUALITY CONTROL
A. Manipulate Equipment by Order or Protocol
1. Oxygen administration devices
a. low-flow devices e.g., nasal cannula
b. high-flow devices e.g., air entrainment mask
c. high-flow nasal cannula
2. CPAP devices – mask, nasal, or bilevel
3. Humidifiers
4. Nebulizers
5. Resuscitation devices e.g., manual resuscitator (bag-valve), mouth-to-valve mask resuscitator
6. Ventilators
a. pneumatic, electric, fluidic, and microprocessor
b. noninvasive positive pressure
c. high frequency
7. Artificial airways
a. oro- and nasopharyngeal airways
b. endotracheal tubes
c. tracheostomy tubes and devices
d. speaking tubes and valves



Clinical Simulation Examination Detailed Content Outline

e. intubation equipment
f. laryngeal mask airway (LMA)
g. esophageal-tracheal Combitube®
8. Suctioning devices
9. Gas delivery, metering, and clinical analyzing devices
a. gas cylinders, regulators, reducing valves, connectors and flowmeters, and air / oxygen blenders
b. oxygen conserving devices e.g., reservoir cannula, pulse-dose
c. oxygen concentrators,
d. portable liquid oxygen systems
e. portable oxygen concentrators
f. air compressors
10. Point-of-care analyzers e.g., blood gas, electrolytes
11. Patient breathing circuits
a. continuous mechanical ventilation
b. IPPB
c. CPAP and PEEP valve assemblies
d. non-invasive ventilation
12. Environmental devices
a. incubators
b. aerosol (mist) tents
c. oxygen hoods
13. Incentive breathing devices
14. Airway clearance devices
a. percussors and vibrators
b. high frequency chest wall oscillation
c. positive expiratory pressure (PEP) devices
d. vibratory PEP devices
15. He / O ₂
16. Manometers e.g., aneroid, digital, water
17. Respirometers e.g., flow-sensing devices
18. ECG monitors
19. ECG machines (12-lead)
20. Hemodynamic monitoring devices
a. pressure transducers
b. catheters e.g., arterial, pulmonary artery
21. Vacuum systems e.g.,
• pumps
• regulators
• collection bottles
• pleural drainage devices
22. Oximetry monitoring devices e.g., pulse oximeter, transcutaneous
23. Metered dose inhalers (MDI) and MDI spacers
24. Dry powder inhalers
25. Bedside screening spirometers



Clinical Simulation Examination Detailed Content Outline

26. CO, He, O₂ and specialty gas analyzers

27. Bronchoscopes

B. Ensure Infection Control

1. Assure cleanliness of equipment by
 - selecting or determining appropriate agent and technique for disinfection and/or sterilization
 - performing procedures for disinfection and/or sterilization
 - monitoring effectiveness of sterilization procedures
2. Assure proper handling of biohazardous materials
3. Incorporate ventilator-associated pneumonia protocol
4. Implement infectious disease protocols e.g.,
 - avian flu
 - SARS
 - transmission prevention
5. Adhere to infection control policies and procedures e.g., Standard Precautions

C. Perform Quality Control Procedures For

1. Blood gas analyzers, co-oximeters
2. Gas analyzers
3. Point-of-care analyzers
4. Pulmonary function equipment
5. Mechanical ventilators
6. Gas metering devices e.g., flowmeter
7. Noninvasive monitors e.g., transcutaneous
8. Record and monitor QC data using accepted statistical methods

III. INITIATION AND MODIFICATION OF THERAPEUTIC PROCEDURES

A. Maintain Records and Communicate Information

1. Record therapy and results using conventional terminology as required in the health care setting and/or by regulatory agencies
 - a. specify therapy administered, date, time, frequency of therapy, medication, and ventilatory data
 - b. note and interpret patient's response to therapy
 - 1) effects of therapy, adverse reactions, patient's subjective and objective response to therapy
 - 2) verify computations and note erroneous data
 - 3) auscultatory findings, cough and sputum production and characteristics
 - 4) vital signs
 - 5) pulse oximetry, heart rhythm, capnography
2. Communicate information
 - a. regarding patient's clinical status to appropriate members of the health care team
 - b. relevant to coordinating patient care and discharge planning
3. Accept and verify patient care orders



Clinical Simulation Examination Detailed Content Outline

4. Apply computer technology to
 - a. document patient management
 - b. monitor workload assignments
 - c. patient safety initiatives e.g., drug dispensing, order entry
5. Communicate results of therapy and alter therapy by protocol(s)
6. Explain planned therapy and goals to a patient in understandable terms to achieve optimal therapeutic outcome
7. Educate a patient and family concerning smoking cessation and health management

B. Maintain a Patent Airway Including the Care of Artificial Airways

1. Properly position a patient
2. Insert oro- and nasopharyngeal airways
3. Perform endotracheal intubation
4. Maintain position in the airway and appropriate cuff inflation of
 - a. LMA
 - b. esophageal-tracheal Combitube®
 - c. endotracheal tube
 - d. tracheostomy tube
5. Assess tube placement
6. Perform tracheostomy care
7. Change tracheostomy tubes
8. Maintain adequate humidification
9. Perform extubation

C. Remove Bronchopulmonary Secretions

1. Perform
 - a. postural drainage, percussion, or vibration
 - b. nasotracheal suctioning
 - c. oropharyngeal suctioning
 - d. airway clearance using mechanical devices e.g., high frequency chest wall oscillation, vibratory PEP
2. Suction artificial airways
3. Administer aerosol therapy with prescribed drugs
4. Instruct and encourage bronchopulmonary hygiene techniques

D. Achieve Adequate Respiratory Support

1. Instruct a patient in
 - a. deep breathing and incentive spirometry techniques
 - b. inspiratory muscle training techniques
2. Initiate and adjust
 - a. IPPB therapy
 - b. continuous mechanical ventilation settings
 - c. noninvasive ventilation
 - d. elevated baseline pressure e.g., CPAP, PEEP
3. Select ventilator graphics e.g., waveforms, scales



Clinical Simulation Examination Detailed Content Outline

- | |
|---|
| 4. Initiate and select appropriate settings for high frequency ventilation |
| 5. Administer medications |
| a. aerosolized |
| b. dry powder preparations |
| c. endotracheal instillation |
| 6. Administer oxygen |
| 7. Initiate and modify weaning procedures |
| 8. Position patient to minimize hypoxemia |
| 9. Prevent procedure-associated hypoxemia e.g., oxygenate before and after suctioning and equipment changes |
| 10. Apply disease-specific ventilator protocols (e.g. ARDS-Net protocol) |
| E. Evaluate and Monitor Patient's Objective and Subjective Responses to Respiratory Care |
| 1. Recommend and review a chest radiograph |
| 2. Obtain a blood gas sample |
| a. by puncture |
| b. from an arterial or pulmonary artery catheter |
| c. from arterialized capillary blood |
| 3. Perform |
| a. transcutaneous monitoring |
| b. pulse oximetry |
| c. blood gas and hemoximetry analyses |
| d. capnography |
| e. hemodynamic assessment |
| 4. Interpret results of |
| a. blood gases |
| b. hemoximetry e.g., carboxyhemoglobin |
| c. hemodynamics |
| d. pulse oximetry |
| e. capnography |
| 5. Observe for |
| a. changes in sputum characteristics |
| b. signs of patient-ventilator dysynchrony |
| 6. Measure and record vital signs, monitor cardiac rhythm, and evaluate fluid balance - intake and output |
| 7. Perform and interpret results of pulmonary function testing |
| a. spirometry |
| b. compliance and airways resistance |
| c. lung volumes |
| d. D_{LCO} |
| e. exercise |
| f. bronchoprovocation studies |
| 8. Recommend blood tests e.g., hemoglobin, potassium |



Clinical Simulation Examination Detailed Content Outline

9. Monitor airway pressures, and adjust and check alarm systems

10. Measure $F_{I}O_2$ and/or oxygen flow

11. Auscultate the chest and interpret changes in breath sounds

F. INDEPENDENTLY MODIFY Therapeutic Procedures Based on the Patient's Response

1. Terminate treatment based on patient's response to therapy

2. Modify treatment techniques

a. IPPB

b. incentive breathing devices

c. aerosol therapy

1) modify patient breathing patterns

2) change type of equipment and change aerosol output

3) change dilution of medication

4) adjust temperature of the aerosol

d. oxygen therapy

1) change mode of administration, flow, and $F_{I}O_2$

2) set up or change an O_2 blender

3) set up an O_2 concentrator or liquid O_2 system

e. specialty gas therapy e.g., He / O_2 NO

1) change mode of administration

2) adjust flow or gas concentration

f. bronchial hygiene therapy

1) alter patient position and duration of treatment and techniques

2) coordinate sequence of therapies e.g.,

• chest percussion • PEP

• postural drainage

g. management of artificial airways

1) reposition or change endotracheal or tracheostomy tube

2) change type of humidification equipment

3) initiate suctioning

4) inflate and / or deflate the cuff

5) perform tracheostomy care

h. suctioning

1) alter frequency and duration of suctioning

2) change size and type of catheter

3) alter negative pressure

4) instill irrigating solutions

i. mechanical ventilation

1) improve patient synchrony

2) enhance oxygenation

3) improve alveolar ventilation

4) adjust I : E settings

5) modify ventilator techniques



Clinical Simulation Examination Detailed Content Outline

- 6) adjust noninvasive positive pressure ventilation
- 7) monitor and adjust alarm settings
- 8) adjust ventilator settings based on ventilator graphics
- 9) change type of ventilator
- 10) change patient breathing circuitry
- 11) alter mechanical dead space
- 12) initiate procedures for weaning

G. RECOMMEND Modifications in the Respiratory Care Plan Based on the Patient's Response

1. Recommend
 - a. institution of bronchopulmonary hygiene procedures
 - b. treatment of pneumothorax
 - c. sedation and/or use of muscle relaxant(s)
 - d. adjustment of fluid balance
 - e. adjustment of electrolyte therapy
 - f. insertion or change of artificial airway
 - g. weaning from mechanical ventilation
 - h. extubation
 - i. discontinuing treatment based on patient response
2. Recommend changes in
 - a. patient position
 - b. inhaled drug dosage or concentration
 - c. F_iO_2 and oxygen flow
3. Recommend changes in mechanical ventilation to
 - a. improve patient synchrony
 - b. enhance oxygenation
 - c. improve alveolar ventilation
 - d. adjust I : E settings
 - e. modify ventilator techniques
 - f. adjust noninvasive positive pressure ventilation
 - g. monitor and adjust alarm settings
 - h. adjust ventilator settings based on ventilator graphics
 - i. change type of ventilator
 - j. change patient breathing circuitry
 - k. alter mechanical dead space
 - l. reduce auto-PEEP
 - m. reduce plateau pressure



Clinical Simulation Examination Detailed Content Outline

4. Recommend pharmacologic interventions including use of
a. bronchodilators
b. antiinflammatory drugs e.g.,
• leukotriene modifiers • cromolyn sodium
• corticosteroids
c. mucolytics and proteolytics e.g.,
• acetylcysteine • hypertonic saline
• RhDNase
d. cardiovascular drugs e.g., ACLS protocol agents
e. antimicrobials e.g., antibiotics
f. sedatives
g. analgesics
h. paralytic agents
i. diuretics
j. surfactants
k. vaccines e.g., pneumovax, influenza
H. Determine the Appropriateness of the Prescribed Respiratory Care Plan and Recommend Modifications When Indicated by Data
1. Analyze available information to determine the pathophysiological state
2. Review
a. planned therapy to establish therapeutic plan
b. interdisciplinary patient and family plan
3. Determine appropriateness of prescribed therapy and goals for identified pathophysiological state
4. Recommend changes in therapeutic plan when indicated
5. Perform respiratory care quality assurance
6. Develop
a. quality improvement program
b. respiratory care protocols
7. Monitor outcomes of
a. quality improvement programs
b. respiratory care protocols
8. Apply respiratory care protocols
9. Conduct health management education
I. Initiate, Conduct, or Modify Respiratory Care Techniques in an Emergency Setting
1. Treat cardiopulmonary emergencies according to
a. BCLS
b. ACLS
c. Pediatric Advanced Life Support (PALS)
d. Neonatal Resuscitation Program (NRP)
2. Treat a tension pneumothorax



Clinical Simulation Examination Detailed Content Outline

3. Participate in
a. land / air patient transport
b. intra-hospital patient transport
c. disaster management
d. medical emergency team (MET) (e.g., rapid response team)
J. Act as an Assistant to the Physician Performing Special Procedures
1. Intubation
2. Bronchoscopy
3. Thoracentesis
4. Tracheostomy
5. Chest tube insertion
6. Insertion of venous or arterial catheters
7. Moderate (conscious) sedation
8. Cardioversion
9. Ultrasound
K. Initiate and Conduct Pulmonary Rehabilitation and Home Care
1. Monitor and maintain home respiratory care equipment
2. Initiate and adjust apnea monitors
3. Explain planned therapy and goals to a patient in understandable terms to achieve optimal therapeutic outcome
4. Educate a patient and family in health management
5. Interact with a case manager
6. Counsel a patient and family concerning smoking cessation
7. Instruct patient and family to assure safety and infection control
8. Modify respiratory care procedures for use in home
9. Initiate treatment for sleep disorders e.g., CPAP

APPENDIX I

CLES-T Instrument.

(1/3)

CLINICAL LEARNING ENVIRONMENT, SUPERVISION AND NURSE TEACHER (CLES+T) evaluation scale

(Saarikoski & Leino-Kilpi 2008)

The following statements concerning the learning environment, supervision and the role of nurse teacher are grounded into main areas, each with their own title.

For each statement, please choose the option that best describes your own opinion.

Evaluation scale:

- 1 = fully disagree
- 2 = disagree to some extent
- 3 = neither agree nor disagree
- 4 = agree to some extent
- 5 = fully agree

The learning environment

Pedagogical atmosphere:

The staffs were easy to approach	1	2	3	4	5
I felt comfortable going to the ward at the start of my shift	1	2	3	4	5
During staff meetings (e.g. before shifts) I felt comfortable taking part in the discussions	1	2	3	4	5
There was a positive atmosphere on the ward	1	2	3	4	5
The staffs were generally interested in student supervision	1	2	3	4	5
The staff learned to know the student by their personal name	1	2	3	4	5
There were sufficient meaningful learning situations on the ward	1	2	3	4	5
The learning situations were multi-dimensional in terms of content	1	2	3	4	5
The ward can be regarded as a good learning environment	1	2	3	4	5

Leadership style of the ward manager (WM):

The WM regarded the staff on her/his ward as a key resource	1	2	3	4	5
The WM was a team member	1	2	3	4	5
Feedback from the WM could easily be considered as a learning situation	1	2	3	4	5
The effort of individual employees was appreciated	1	2	3	4	5

Nursing care on the ward:

The wards nursing philosophy was clearly defined	1	2	3	4	5
Patients received individual nursing care	1	2	3	4	5
There were no problems in the information flow related to patients' care	1	2	3	4	5
Documentation of nursing (e.g. nursing plans, daily recording of nursing procedures etc.) was clear	1	2	3	4	5

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The supervisory relationship

In this form, the concept of supervision refers guiding, supporting and assessing of student nurses made by clinical staff nurses. Supervision can occur as individual supervision, or as group (or team) supervision.

The concept of mentor means a named personal supervisor.

Occupational title of supervisor:	nurse	1
	nurse specialist	2
	assistant ward manager	3
	sister/ ward manager	4
	other, what? _____	

Occurrence of supervision: (circle one alternative only)

I did not have a supervisor at all	1
A personal supervisor was named, but the relationship with this person did not work during the placement	2
The supervisor changed during the placement, even though no change had been planned	3
Supervisor varied according to shift or place of work	4
Same supervisor had several students and was a group supervisor rather than an individual supervisor	5
A personal supervisor was named and our relationship worked during this placement	6
Other method of supervision, please specify?	

How often did you have separate private unscheduled supervision with the supervisor (without nurse teacher):	not at all	1
	once or twice during the course	2
	less than once a week	3
	about once a week	4
	more often	5

The content of supervisory relationship:

The following statements concerning the supervisory relationship.

For each statement, please choose the option that best describes your own opinion.

Evaluation scale:

1 = fully disagree
2 = disagree to some extent
3 = neither agree nor disagree
4 = agree to some extent
5 = fully agree

My supervisor showed a positive attitude towards supervision	1	2	3	4	5
I felt that I received individual supervision	1	2	3	4	5
I continuously received feedback from my supervisor	1	2	3	4	5
Overall I am satisfied with the supervision I received	1	2	3	4	5
The supervision was based on a relationship of equality and promoted my learning	1	2	3	4	5
There was a mutual interaction in the supervisory relationship	1	2	3	4	5
Mutual respect and approval prevailed in the supervisory relationship	1	2	3	4	5
The supervisory relationship was characterized by a sense of trust	1	2	3	4	5

Role of the nurse teacher

Nurse teacher is a lecturer (employed by University or Polytechnic) who is responding the clinical placement. The following statements concerning the linking nurse teacher are grounded into main areas, each with their own title.

Evaluation scale:

- 1 = fully disagree
 2 = disagree to some extent
 3 = neither agree nor disagree
 4 = agree to some extent
 5 = fully agree

For each statement, please choose the option that best describes your own opinion.

Nurse teacher as enabling the integration of theory and practice:

In my opinion, the nurse teacher was capable to integrate theoretical knowledge and everyday practice of nursing	1	2	3	4	5
The teacher was capable to operationalise the learning goals of this clinical placement	1	2	3	4	5
The nurse teacher helped me to reduce the theory-practice gap	1	2	3	4	5

Cooperation between placement staff and nurse teacher:

Nurse teacher was like a member of the nursing team	1	2	3	4	5
Nurse teacher was capable to give his or her pedagogical expertise to the clinical team	1	2	3	4	5
The nurse teacher and the clinical team worked together in supporting my learning	1	2	3	4	5

Relationship among student, mentor and nurse teacher:

The common meetings between myself, mentor and nurse teacher were comfortable experience	1	2	3	4	5
In our common meetings I felt that we are colleagues	1	2	3	4	5
Focus of the meetings was in my learning needs	1	2	3	4	5

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Thank you for your time and help!

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