

## **Issue Paper: Entry to Respiratory Therapy Practice 2025**

### **Introduction**

Respiratory Therapy practice and the profession have evolved from the days of oxygen therapy, arterial blood gas interpretation, and nebulizer therapy. Today's practice requires respiratory therapists to have extensive assessment abilities and practice competencies required to initiate and provide cardiopulmonary interventions for their patients across a broad scope of practice and in a variety of patient care venues. Many respiratory therapists currently practice at this higher capacity and competency-level and are considered expert consultants in their workplace. Unfortunately, it is the minority that practice at this higher level, resulting in a vast variability in practice around the country, making it difficult to establish a baseline standard of practice for the profession, and impeding the ability to provide research and evidence to justify and improve the science of respiratory care.

The adequacy of the associate degree as the minimum educational preparation for respiratory therapists and entry to practice has been questioned for many years.<sup>1</sup> Since 2003 a growing body of knowledge in respiratory therapy related to preferences for educational level, essential competencies, and promoting baccalaureate degree completion has developed. An attached table provides a summary of published evidence for baccalaureate education. (See Appendix 1)

Since 2010, many have called for changes needed to meet the goals recommended by the Respiratory Care in 2015 and Beyond conferences. Many have wanted, and asked, the American Association for Respiratory Care (AARC) to take the lead in making the changes necessary to reach the potential of the respiratory therapist described in these conferences. Moreover, at times, a small subset of the profession have advocated for no changes to occur in education or credentialing of respiratory therapists despite the recommendations of expert thought leaders. In 2018 the Board of Directors of the AARC made a decision to implement the recommendations needed to achieve the outcomes endorsed by the Respiratory Care in 2015 and Beyond conferences. The AARC believes that a baccalaureate degree in respiratory therapy, or health sciences with a concentration in respiratory therapy, is essential to meet minimum competency requirements to enter professional practice. The AARC is committed to ensuring that all respiratory therapists entering practice in the year 2025 have a baccalaureate degree and the Registered Respiratory Therapist (RRT) credential. This is important, not only to meet the increasing challenges of current professional practice, but also to ensure patient safety and the efficient delivery of effective patient care.

The purpose of this document is to demonstrate the need to advance the minimum education of a respiratory therapist from an associate degree to a baccalaureate degree and to advance the licensure of practitioners to the RRT credential.

### **Background**

The respiratory therapy profession emerged due to a need for the delivery of specialty care for patients in hospitals. Since the initial stages of oxygen therapy administration, the profession has continued to evolve to fill the unmet needs for individuals with cardiopulmonary impairment or disease. This evolution has included a change in name from oxygen technician to respiratory therapist over the years, and the name change has been accompanied by the

requirement for an increased level of education and training. Starting with on-the-job training, the requirements for respiratory therapy educational programs designed for entry to practice evolved to hospital-based certificate programs, community college-based associate degree programs, and now includes baccalaureate and master's degree educational programs and internships at colleges and universities. Professional practice has also advanced and now requires respiratory therapists to achieve national credentialing and licensure to practice in forty-nine states, the District of Columbia and Puerto Rico. Meeting patients' needs and providing safe and effective care have served as the driving-forces behind these advances.

We now face another transition point in the profession. A brief review of the process used to determine the competencies required for entry to respiratory therapy practice in the current health care system is presented below. In 2007, the AARC brought all the stakeholders to the table to determine if there were evolving needs in cardiopulmonary care that were not being addressed. Patient advocacy and provider groups spoke to their needs and asked respiratory therapists to step up and close the identified gaps in the efficient provision of safe and effective patient care. Kacmarek et al, reported on the series of meetings (consensus conferences), the background on the issues, and the process used to develop the characteristics of the respiratory therapist of the future.<sup>2</sup>

From 2008 to 2010 as part of the strategic planning process, the AARC conducted three conferences (which became known as Respiratory Care in 2015 and Beyond) to envision and discern the future practice of respiratory therapy. Thought leaders asked three questions: (1) What will the US health care system look like beyond 2015?; (2) What roles and competencies are required for respiratory therapists to succeed and prosper?; and (3) How must the profession transition to meet the demand for safe and efficient patient care in the future? A brief review of the recommendations endorsed by the three conferences appearing below will serve as a conceptual framework for changes needed by 2025 and a justification of mandating the baccalaureate degree and RRT credential for licensure as requirements for entry to practice for respiratory therapists beginning in 2025.

In March 2008, the focus of the first conference was to create a foundation and vision for the profession by examining expected changes in health care and how this may affect the respiratory therapist in the year 2015 and beyond. It was determined that in order to remain relevant as the United States adjusted to population increase, and the need to decrease the cost of health care while maintaining or improving quality, respiratory therapists must be conversant about disease management, biomedical innovation, and human resource issues. The second conference, in April 2009, focused on the competencies needed by graduate respiratory therapists, and the existing workforce, as the profession adjusts to the projected changes in health care. These competencies are now published (see link: [Competencies for Entry to Respiratory Therapy Practice](#)) and are separated into those competencies that are needed by graduates to enter practice and those competencies needed to be acquired after entry to practice. Lastly, the third conference held in July 2010 sought to determine how the respiratory therapy education system (both before and after degree conferral) needed to change in order for the competencies required of the future respiratory therapy workforce would be accomplished with minimal impact on current personnel.

Together with the AARC, the stakeholders developed an outline of the characteristics for the respiratory therapist for 2015 and beyond (Appendix 2). The competencies identified often

exceeded the then current baseline practice within the profession. As a result, new educational competencies were incorporated into an educational matrix to ensure the baseline knowledge of every new respiratory therapy program graduate would be at the level needed to achieve the identified characteristics.<sup>3</sup>

In present day practice, we have seen the fruition of the non-traditional roles for respiratory therapists foreseen by those participating in the consensus conferences. We also see the need for all health care providers to do more with less and continue to challenge the status quo. All of us must work smarter and move the needle on improving patient safety and the efficiency of providing effective patient care. The competencies required to do this are not only relegated to the theoretical and technical aspects of the profession presented in the curriculum of the educational programs, or tested by credentialing exams, but also include a broad set of competencies that are best learned through the social sciences. These competencies include: (1) integrating our practice into that of an interprofessional team, while simultaneously playing the role of a team member and a team leader, (2) empathizing with patients, caregivers, family members, and colleagues of different cultures to help mediate communication and assist in moving a therapeutic plan forward, (3) working within an established system to positively foster change while challenging the same system to morph to accommodate the ever evolving health care system, and (4) critiquing, participating with, and leading research to develop new therapeutic options for diseases and determine how they are related to growing lists of comorbidities and environmental challenges. Working in health care today requires respiratory therapists to critically think and analyze situations, and make critical decisions quickly and efficiently. Respiratory therapists must be committed to lifelong learning and this commitment exceeds the former focus on specific diseases and the task of delivering therapies that were not grounded in evidence.

### **Justification for Baccalaureate Degree for Entry to Practice**

Respiratory therapy education programs have two distinct components designed to meet the needs of their students as they prepare for entry to the profession. Predominantly classroom lecture serves to provide didactic theory and lab/clinical time is designated for the practice and application of theory. Though the lecture format provides new information and concepts, it is a passive learning style and students are left to organize and analyze their new knowledge for application. This teaching style does not incorporate critical thinking and critical decision making for the application of didactic theory. The clinical laboratory classes and clinical hospital rotations are essential and meant to assist with the practical application of the didactic knowledge.

Critical thinking in daily respiratory therapy practice involves the ability to prioritize the expected and the unexpected, anticipate problems and quickly resolve them, troubleshoot technical problems, and communicate effectively with patients, families, and clinical team members.<sup>4</sup> To develop these skills, lab and clinical time is needed in order to learn and refine the application of knowledge with a problem based learning methodology.<sup>5-10</sup>

Assessment of critical thinking and decision-making skills has been performed in respiratory therapy students with both associate and baccalaureate degrees. With the use of validated assessment tools such as the Watson-Glaser Critical Thinking Appraisal and the Health Sciences Reasoning Test, studies have shown that students with baccalaureate preparation have a higher level of critical thinking skills than their associate degree-prepared counterparts.<sup>11, 12</sup>

Additionally, there is a growing body of evidence that nurses with a baccalaureate degree in nursing (BSN) provide an improved quality and safe care with a direct correlation to a reduction in mortality as compared to those with an associate degree.<sup>13-21</sup>

Much of this is attributed to the liberal arts course work of the degree, and the extended lab and clinical time used to expand critical thinking and critical decision-making skills. As the two professions – respiratory therapy and nursing – are very similar in job responsibilities and educational backgrounds, this evidence may serve as a window to the improvements in patient care that are anticipated with advancement to the baccalaureate from the associate degree for preparation of respiratory therapists.

With expanding expectations to serve as cardiopulmonary care managers, work as members of interprofessional clinical teams, make decisions based on changing data-driven evidence, and be competent across multiple health care venues, it is essential for respiratory therapists to enhance their critical thinking and problem-solving aptitudes in order to safely and efficiently provide patient care. As such, there is a need for respiratory therapy students to exceed the associate degree, the degree the majority of respiratory therapy educational programs currently bestow.

The 2015 and Beyond Task Force identified the competencies that are expected for the safe, effective, and efficient practice of a respiratory therapist in the current health care system and recommended that those competencies can best be obtained through the completion of a baccalaureate degree.<sup>23</sup> In order to provide quality patient care, improve health care outcomes, eliminate unnecessary care, and improve patient safety we must meet these expectations.

According to a study conducted by Varekojis, 70.6% of Respiratory Therapy Department hiring officials indicated they prefer to employ respiratory therapists with a baccalaureate degree.<sup>24</sup> These hiring officials specified that a respiratory therapist with a baccalaureate degree added value to their department in a number of ways including being prepared: (1) to work effectively with the health care team, (2) to complete orientation in a timely and cost-effective manner, (3) to provide evidence-based respiratory therapy services, (4) to provide safe and effective patient care, and (5) for professional advancement.

Another study conducted by The Pennsylvania Respiratory Research Collaborative (PRRC) surveyed 188 hospitals.<sup>25</sup> Of the 101 respondents, 50% of the hospitals preferred the baccalaureate prepared respiratory therapist upon employment.

Continuous changes in clinical practice and in the health care environment will necessitate the need for higher education standards for respiratory therapists. In order to advance into roles in leadership, disease management, post-acute care, and the specialty care areas, the respiratory therapist must possess education and training specific to these roles. Due to the limited hours available in the curriculum of an associate degree program, developing proficiency for these new roles will be difficult to achieve.

### **Justification for Registered Respiratory Therapy (RRT) Credential for Entry to Practice**

The assessment of critical thinking and decision making is already incorporated into the two-part registry exam with the addition of the clinical simulation exam. All Commission on Accreditation for Respiratory Care (CoARC) approved respiratory therapy educational programs must incorporate the minimum competencies for Registered Respiratory Therapist (RRT)

credential eligibility in their didactic and clinical curriculum. Thus, in order to ensure valid assessment of the critical thinking and decision-making skills required of a respiratory therapist, all program graduates should be required to achieve the RRT credential. Therefore, moving forward the option to enter practice based on achieving the National Board for Respiratory Care's (NBRC) Certified Respiratory Therapist (CRT) credential must be eliminated for all future program graduates.

### **Justification for Registered Respiratory Therapist Credential for Licensure**

The purpose of licensure in each state is two-fold -- protecting the citizens (consumers) of the state and establishing a scope of practice for the profession. Protecting the consumer is established through the licensure process which typically includes background checks, fingerprinting, as well as educational and credentialing requirements. The scope of practice on the other hand establishes the minimum standards and areas of competency a licensee is expected to demonstrate in order to safely practice.

Today, because of the extensive efforts of the CoARC and the NBRC, education standards and credentialing requirements for respiratory therapists are essentially standardized throughout the country. Laws have been changed to reflect these established standardized requirements and forty-nine states, the District of Columbia and Puerto Rico currently require some form of licensure for practice. However, market demands and changes in the health care environment have forced some states to move faster than the profession in making the changes necessary to accommodate the rapid expansion of the practice of respiratory therapists. As a result, within the last few years, some state regulatory boards have begun the process of raising their credentialing requirements to ensure the health and welfare of their citizens. Making this change may, or may not, require states to modify their practice acts. However, states that have already completed the process, or are examining methods to transition to the RRT credential, can provide guidance, or serve as models, for transitioning to the RRT credential for licensure. (See list of Additional Resources Link to Document: [RRT Entry to Licensure](#)).

### **References**

1. Effects from Education Program Type on RRT Candidate Outcomes: A study conducted by the NBRC. 2010. [https://www.aarc.org/wp-content/uploads/2013/07/nbrc\\_program\\_study.pdf](https://www.aarc.org/wp-content/uploads/2013/07/nbrc_program_study.pdf). (Accessed January 3, 2019).
2. Kacmarek RM, Durbin CG, Barnes TA, Kageler WV, Walton JR, O'Neil EH. Creating a vision for respiratory care in 2015 and beyond. *Respir Care* 2009;54(3):375-389.
3. Barnes TA, Gale DD, Kacmarek RM, Kageler WV. Competencies needed by graduate respiratory therapists in 2015 and beyond. *Respir Care* 2010;55(5):601-616.
4. Mishoe, SC. Critical thinking in respiratory care practice: A qualitative research study. *Respir Care* 2003;48(5):500-516.
5. Neufeld VR, Barrows HS. The "McMaster Philosophy": an approach to medical education. *J Medical Education* 1974;49(11):1040-1050.
6. Mishoe SC. Critical Thinking, Educational preparation and development of respiratory care practitioners. *Distinguished Papers Monograph* 1993;2(1):29-43.

7. Mishoe SC, MacIntyre NR. Expanding professional roles for respiratory care practitioners. *Respir Care* 1997;42(1):71-91.
8. Mishoe SC, Hernlen K. Teaching and evaluating critical thinking. *Respir Care Clin N Am* 2005;11(3):477-488.
9. Hay PJ, Katsikitis M. The expert in problem-based and case-based learning: necessary or not? *Med Educ* 2001;35(1):22-26.
10. Beachey W. A comparison of problem-based learning and traditional curricula in baccalaureate respiratory therapy education. *Respir Care* 2007;52(11):1497-1506.
11. Hill TV. The relationship between critical thinking and decision-making in respiratory care students. *Respiratory Care* 2002;47(5):571-577.
12. Clark M. Critical thinking in respiratory therapy students: comparing baccalaureate and associate degree students, 2012 ProQuest LLC, Ph.D. Dissertation, Capella University 135 pp.
13. Aiken LH, Clarke SP, Cheung RB, Sloane DN, Silber JH. Education levels of hospital nurses and surgical patient mortality. *JAMA* 2003;290(12):1617-1623.
14. Estabrooks CA, Midodzi WK, Cummings GC, Ricker KL, Giovanetti P. The impact of hospital nursing characteristics on 30-day mortality. *Nursing Research* 2005;54(2):72-84.
15. Tourangeau AE, Doran DM, McGillis Hall L, O'Brien Pallas L, Pringle D, Tu JV, Cranley LA. Impact of hospital nursing care on 30-day mortality for acute medical patients. *Journal of Advanced Nursing* 2007;57(1):32-41.
16. Aiken LH, Clarke SP, Sloane DM, Lake ET, Cheney T. Effects of hospital care environment on patient mortality and nursing outcomes. *Journal of Nursing Administration* 2008;38(5):223-229.
17. Friese CR, Lake ET, Aiken LH, Silber JH, Sochalski J. Hospital nurse practice environments and outcomes for surgical oncology patients. *Health Sciences Research* 2008;43(4):1145-1163.
18. Blegen MA, Goode CJ, Park SH, Vaughn T, Spetz J. Baccalaureate education in nursing and patient outcomes. *Journal of Nursing Administration* 2013;43(2):89-94.
19. Kutney-Lee A, Sloane DM, Aiken L. An increase in the number of nurses with baccalaureate degrees is linked to lower rates of post-surgery mortality. *Health Affairs* 2013;32(3):579-586.
20. McHugh MD, Kelly LA, Smith HL, Wu ES, Vanak JM, Aiken LH. Lower mortality in magnet hospitals. *Medical Care* 2013;51(5):382-388.
21. Yakusheva O, Lindrooth R, Weiss M. economic evaluation of the 80% baccalaureate nurse workforce recommendation: A patient-level analysis. *Medical Care* 2014;52(10):864-869.
22. American Association for Respiratory Care. New HCFA regulation calls RTs "Professionals". AARC Report Mar 2001.
23. Barnes TA, Gale DD, Kacmarek RM, Kageler WV, Morris MJ, Durbin CG. Transitioning the respiratory therapy workforce for 2015 and beyond. *Respir Care* 2011;56(5):681-690.
24. Varekojis, SM. Respiratory therapy department directors' preferences regarding the educational background of new graduate staff respiratory therapists. *Respiratory Care Educational Annual* 2018;27:16-21.

25. Armaghan R, Greesey B, Juby J, Amador-Castaneda J, Bollinger A, Roberts K, et al. Description of the practice of respiratory therapy in the state of Pennsylvania. (abstract) *Respir Care* October 2018;63(Suppl 10) 3013629.

**Additional Resources Available:**

AARC Education Resources

- Competencies for Entry into Respiratory Therapy Practice  
Link to Document: [Competencies for Entry into Respiratory Therapy Practice](#)
- Transitioning from an Associate Degree Program to a Baccalaureate Degree Program -- includes PowerPoint presentation, transition checklist, and 2014 Human Resource survey information related to compensation  
Link to Document: [Transitioning from Associate to Baccalaureate Degree Program](#)

AARC Position Statements and Guidance Documents:

- Position Statement – “Respiratory Care Scope of Practice” (11/2018)  
Link to Document: [Respiratory Care Scope of Practice](#)
- Guidance Document – “RRT Entry to Licensure” (03/2017)  
Link to Document: [RRT Entry to Licensure](#)

CoARC Report

- Competency Based Education: A review of policies and implications for respiratory care accreditation. 2012.  
Link to Document: [Competency-Based-Accreditation-Standards-5-18-12](#)

## Appendix 1: Summary of Published Evidence for Baccalaureate Education

	Source/Citation	Author(s)	Title	Summary/Main Points
1	<i>Respiratory Therapy</i> . 1986, 16(2):7.	Farrell D	Are Two Years enough?...Respiratory Care Profession	Oldest citation referenced (see # 12). Journal no longer in print. Appears to be an editorial.
2	<i>Respir Care</i> . January 1992, 37(1): 65-78.	O'Daniel C, Cullen DL, Douce FH, Ellis GR, Mikles SP, Wiezalis CP, Johnson PL Jr., Lorange ND, Rinker R	The Future Educational Needs of Respiratory Care Practitioners: A Delphi Study	Consensus results of Delphi Study, which recommended minimal level of education at AS level and need for additional education is in the best interest of future RT workforce.
3	<i>AARC Distinguished Papers Monographs</i> . 1993, 2: 29-43.	Mishoe SC	Critical Thinking, Educational Preparation, and Development of Respiratory Care Practitioners	RTs empowered to work independently and to evaluate and make decisions regarding treatment and changes in care plan, need to be able to make appropriate decisions effectively and efficiently.
4	<i>Respir Care</i> . September 1993, 38(1): 1014-9.	Douce FH, Cullen DL	The Length of Educational Preparation and Academic Awards for Future Respiratory Care Practitioners: A Delphi Study	Delphi process, which reports that increasing program length, may be necessary if competency-based education becomes a reality.
5	<i>Respir Care</i> . November 1993, 38(11): 1219.	Pilbeam SP, Meredith RL, McCarthy K, Stoller JK	Proficiency in Applying Treatment Algorithms: Training at Clinical Sites Using Therapist-Driven Protocols (TDP) is Associated With Better Performance	Abstract: Staff who worked at hospitals with TDPs in use for more than one year scored higher (more correct answers) on 6 case studies when compared to staff in hospitals not using TDPs.
6	<i>Respir Care</i> . July 1994, 39(7): 709-11.	Meredith RL, Pilbeam SP, Stoller JK	Is Our Educational System Adequately Preparing Respiratory Care Practitioners for Therapist-Driven Protocols?	Editorial: Need for integration of CPGs and algorithms into educational curricula. The need to discuss the reasons for care plans to encourage critical thinking.
7	<i>JAH</i> , 2001 30(1): 20-25.	Goodfellow LT	A Self-Assessment by Respiratory Therapists of Their Own Critical Thinking Behaviors	Ranking of CT behaviors. Years of work experience significant for self-assessing these behaviors.

	<b>Source/Citation</b>	<b>Author(s)</b>	<b>Title</b>	<b>Summary/Main Points</b>
<b>8</b>	<i>Respir Care</i> . May 2002, 47 (5) 571-577.	Hill TV	The Relationship Between Critical Thinking and Decision Making in Respiratory Therapy Students	Critical thinking proficiency as part of a process is useful for evaluating potential students.
<b>9</b>	<i>Respir Care</i> . May 2002, 47 (5) 568-9.	Mishoe SC	Educating Respiratory Care Professionals: An Emphasis on Critical Thinking	Editorial: Supports evidence of relationship between critical thinking and decision-making.
<b>10</b>	<i>Respir Care</i> . May 2003, 48 (5) 500-516.	Mishoe SC	Critical Thinking in Respiratory Care: A Qualitative Research Study	Describes critical thinking in respiratory care. Findings suggest this involves the abilities to prioritize, anticipate, troubleshoot, communicate, negotiate, reflect, and make decisions.
<b>11</b>	<i>Respiratory Care Education Annual</i> . Vol. 12, Fall 2003: 11-19.	Becker E	Point of View: Promoting Baccalaureate Completion Among Respiratory Therapists	Review of literature for re-professionalization of education and proposes a 2-stage model for moving to BS entry.
<b>12</b>	<i>Respiratory Care Education Annual</i> . Vol. 12, Fall 2003: 29-39.	White Paper from the AARC Steering Committee of the Coalition for Baccalaureate and Graduate Respiratory Therapy Education	Development of Baccalaureate and Graduate Degrees in Respiratory Care	Rationale and need to increase number of RTs with advanced levels of training and education to meet demands for complex cognitive abilities and patient management skills.
<b>13</b>	<i>Respir Care</i> . September 2003, 48(9) 840-858.	Becker EA	Respiratory Care Managers' Preferences Regarding Baccalaureate and Master's Degree Education for Respiratory Therapists	Managers showed preference for hiring experienced BSRTs but did not prefer entry-level BSRTs degrees. Graduate degrees supported for managers, clinical specialists, educators, and supervisors. Most managers supported some use of distance learning for graduate degrees.
<b>14</b>	<i>Respiratory Therapy</i> . 2006; 1(5):29-36.	Clark K	Teaching Outside the Box: A Constructivist Approach to Facilitating Critical Thinking in	Constructivism: active view of learning in which learner constructs knowledge by connecting new information to previous knowledge and experience. Approaches include

	Source/Citation	Author(s)	Title	Summary/Main Points
			Respiratory Therapy Education	inquiry-based, problem-based, and research-based learning methods.
15	<i>Respir Care</i> . December 2007, 52 (12) 1680-1685.	Pierson DJ	Respiratory Care: A Decade of Challenge and Progress	Changes reviewed in the profession during Dr. Pierson's tenure as editor of <i>Respiratory Care</i> . Most notable is the globalization of <i>Respiratory Care</i> and that the profession has evolved from "respiratory care practitioners" to "respiratory therapists".
16	<i>Respir Care</i> . March 2009, 54 (3) 375-389.	Kacmarek RM, Durbin CG, Barnes TA, Kageler WV, Walton JR, O'Neil EH.	Creating a Vision for Respiratory Care in 2015 and Beyond	US healthcare system will change, driven by need to increase quality, while decreasing costs; emphasis will be on managing chronic care, wellness and prevention.
17	<i>Respir Care</i> . May 2010, 55 (5) 601-616.	Barnes TA, Gale DD, Kacmarek RM, Kageler WV	Competencies Needed by Graduate Respiratory Therapists in 2105 and Beyond	Identified skills, knowledge and competencies needed by graduate therapists to practice in 2015 and beyond.
18	<i>Respir Care</i> . May 2011, 56 (5) 681-690.	Barnes TA, Kacmarek RM, Kageler WV, Morris MJ, Durbin CG	Transitioning the Respiratory Therapy Workforce for 2015 and Beyond	Recommends that baccalaureate entry-level be phased in by year 2020, and the elimination of the NBRC CRT exam.
19	<i>Respir Care</i> . December 2011; 56(12):1906-15.	Kacmarek RM, Barnes TA, Durbin CG	Survey of Respiratory Therapy Program Directors in the United States	Results of survey indicate that there are important differences that exist between associate and baccalaureate degree programs in their ability to provide graduates with the competencies identified in reference # 17. In addition, directors agree that the RRT credential (instead of the CRT credential) should be required for entry to practice.
20	<i>Respir Care</i> . December 2011, 56 (12) 1977-1978.	Goodfellow LT	2015 and Beyond Usable and Unbiased Data	Editorial: Critique of survey results found in #19. Differences between AS and BS programs are that BS programs cover more competencies identified in conference two of 2015 and Beyond, which includes research, evidenced-based practice,

	Source/Citation	Author(s)	Title	Summary/Main Points
				healthcare policy, and advanced practice models.
21	<i>Respir Care</i> . May 2012, 57 (5) 710-720.	Kacmarek RM, Barnes TA, Durbin CG	Survey of Directors of Respiratory Therapy Departments Regarding the Future Education and Credentialing of Respiratory Care Students and Staff	Agreement that graduate and practicing therapists should obtain majority of the 66 competencies surveyed and that the entry-level credential should be the RRT. Similar numbers of managers favored an entry-level baccalaureate degree as favored an associate degree.
22	<i>Respiratory Care. Education Annual</i> . Vol. 21, Fall 2012: 1-3.	Beachy W	Baccalaureate Entry-Level Education in Respiratory Care	Editorial: uses the three 2015 publications as evidence of need for BS entry.
23	<i>Respiratory Care. Education Annual</i> Vol. 21, Fall 2012: 19-26.	Varekojis S, Douce HF	The Need for and Impact of Requiring the Registered Respiratory Therapist Credential for a License	Identified overutilization of CRTs to practice at RRT level; found positive impacts of requiring RRT and perceived impact of requiring RRT do not match actual experience of departments when RRT required in Ohio.
24	<i>J Res Pract</i> . March 2013, 37:5, 365-373.	Batts DL, Pagliari LR	Transforming the Terminal Associates of Applied Science into a Four-Year Degree: A Win-Win Situation for Students, Community Colleges, Universities, and Businesses, Community College	While personal goals, professional development, job advancement, and increased salaries all play a role in decisions made by possible transfer students, it is the employer overall who will benefit from the applied bachelor's degree because of the increase of knowledge and basic skills of the American workforce. Obtaining this type of degree is a win-win for all involved.
25	<i>Respir Care</i> . June 2013, 58 (6) 1087-1096.	Kacmarek RM	Mechanical Ventilation Competencies of the Respiratory Therapist in 2015 and Beyond	Conference Proceeding: Due to complexity of mechanical ventilation, education level must be at baccalaureate level with evidence of need to support this change.
26	<i>Respir Care</i> . August 2013; 58(8):1377-1385.	Myers TR	Thinking Outside the Box: Moving the Respiratory Care Profession Beyond the Hospital Walls	Editorial: Core competencies of technical proficiency, interprofessional practice, communication, critical thinking, and professionalism are vital

	Source/Citation	Author(s)	Title	Summary/Main Points
				elements of the foundational underpinning for the strategies that will move the profession forward.
27	<i>Respir Care</i> . December 2014, 59(12):1817-24.	Becker EA, Nguyen XT	The Current Impact of Entry-level Associate and Baccalaureate Degree Education on the Diversity of Respiratory Therapists	Current entry-level associate and baccalaureate degree graduates have similar gender and race proportions. This finding challenges concerns that an entry-level baccalaureate degree will decrease the diversity of the respiratory therapist workforce.
28	<i>Respir Care</i> . March 2017 62(3):279-287.	Smith SG, Endee LM, Benz Scott LA, Linden PL	The Future of Respiratory Care: Results of a New York State Survey of Respiratory Therapists	Findings emphasize that viability of the profession in current health-care environment calls for a more autonomous RT who can be reimbursed for services; and obtain salaries that are competitive with other health professions.
29	<i>Respir Care</i> . March 2017, 62 (3) 384-386.	Kacmarek RM, Walsh BK	The Respiratory Therapy Profession is at a Crossroads	Editorial: Supports findings of NY survey that baccalaureate entry-level education is essential.
30	<i>Respir Care</i> . May 2017, 62 (5) 636-638.	Jones TD	From Here to There: Vision, Value, and the Advancement of Respiratory Care	Editorial: Moving profession from here to there will require influential practitioners who can articulate the collective vision for respiratory care and demonstrate the value of our profession in whatever practice settings they encounter.
31	<i>Respiratory Care Education Annual</i> . Vol. 27, Fall 2018: 16-21.	Varekojis SM, Brownfield TJ, Gates RM, Schulte MJ, Maddison AD	Respiratory Therapy Department Directors' Preferences Regarding the Educational Background of New Graduate Staff Respiratory Therapists	Online survey: 28.6% response rate; Majority of managers prefer BSRT entry hires because of the added value in teamwork, communication, ability to advance and provide evidence-based RT. Belief that this trend will continue due to evolving RT practice and changing health care environment.
32	<i>Respir Care</i> . October 2018 63(10): 1207-1213.	Becker EA, Vargas J	Communication of Career Pathways Through Associate Degree Program Web	ASRT program websites often lacked reference to pursuing a baccalaureate degree, and information about transfer credits and articulations agreements. RTs

	Source/Citation	Author(s)	Title	Summary/Main Points
			Sites: A Baseline Assessment	need to know the differences in degree type (Bachelor of Science vs. Bachelor of Applied Science).
33	<i>Respir Care</i> . October 2018, 63 (10) 1316-1317.	Strickland S	Breaking Down Barriers to Professional Growth	Editorial: Logical process to transition from AS to BS is via degree advancement in support of #32.
34	<i>High Educ Policy</i> . September 2018, 31: 359-380.	Hu X, Ortagus JC, Kramer DA	The Community College Pathway: An Analysis of the Costs Associated with Enrolling Initially at a Community College Before Transferring to a 4-Year Institution.	Empirical evidence of potential trade-offs associated with direct savings in cumulative loan debt and indirect costs of community college enrollment related to decreases in the likelihood of baccalaureate degree attainment and increases in time-to-degree.
35	<i>Respir Care</i> . October 2018, 63 (10).	Whitten S, Brewer S, Dziodzio J, Igo D, Reed K, McGrath S, Holcomb B, Chambers C, Denton E, Parent E, Kessler R, McNally M, Kannewurff P	Advanced Degrees and Professional Development: Assessing the attitudes and Beliefs of Respiratory Therapists at Three Academic Medical Centers	Abstract: results suggest without a greater understanding and communication on the value and benefit of obtaining an advanced degree, progress on this goal may be slower than anticipated.

**Additional Source –**

1. Unpublished dissertation – Clark, MC (2012) Critical Thinking in Respiratory Therapy Students: Comparing Baccalaureate and Associate degree Students. The Health Science Reasoning Test (HSRT – which measures reasoning and decision making processes) was administered to four RT programs in PA (3 Associate and 1 baccalaureate). Results indicate BS students had significant differences in the mean HSRT total scores but no differences seen between BS and AS for HSRT subscale scores.

## **Appendix 2: Comparison of current Commission on Accreditation for Respiratory Care (CoARC) guidelines to competencies from 2015**

The 2017 CoARC Accreditation Standards for Entry into Respiratory Care Professional Practice manual provides a broad range of patient care competencies for entry-level respiratory therapists and four “core competencies”.<sup>1</sup> Also included are “core competencies,” first defined by Prahalad and Hamel (1990) as the collective learning of an organization or a profession to distinguish differences or competitive advantages.<sup>2</sup>

CoARC has determined the following as core competencies for the respiratory therapy profession: (1) ability to perform all diagnostic and therapeutic procedures required of a respiratory therapist entering the profession, (2) graduates must function within inter-professional teams, communicate effectively with diverse populations (various ages, abilities, ethnicities, etc.), (3) be competent in the application of problem solving strategies, and (4) the application of ethical decision-making and professional responsibility.

In 2010, competencies needed by graduate respiratory therapists in 2015 and beyond were published.<sup>3</sup> These competencies were categorized into seven areas to include: diagnostics, disease management, evidence-based medicine and respiratory therapy protocols, patient assessment, leadership, emergency and critical care, and therapeutics. CoARC recommended that the AARC conduct a follow-up survey to determine when these competencies are to be acquired. Three timelines were established: (1) competencies expected upon graduation from an entry into profession program, (2) competencies expected after a defined period of professional practice, and (3) competencies that are beyond the scope of current respiratory therapy practice and therefore, should be an advanced competency. In 2016, the “Taskforce on Competencies for Entry into Respiratory Therapy Practice”, with representation from the AARC, CoARC and the NBRC, analyzed 202 competencies which were generated from the seven areas of practice.<sup>4</sup> All taskforce members provided their expert professional opinion as to when a competency should be acquired. The published results showed that of the 202 competencies reviewed, 153 competencies should be acquired before entry to professional practice and 49 competencies should be attained after entry into professional practice.<sup>4</sup> The report concludes that new graduates of respiratory therapy educational programs have many competencies needed prior to entry into professional practice. Another finding is that practicing respiratory therapists must continue their development post-graduation to attain additional competencies. One limitation was that not all competencies needed for respiratory therapy practice may have been captured with this analysis. It is reasonable to believe that respiratory therapy practice has continued to advance and change and therefore not all competencies were captured in 2010. Another limitation is that there has been no examination of practicing respiratory therapists to determine if the 49 additional competencies necessitated after entry to practice have been achieved.

In an effort to determine if there are any gaps from the published competencies of 2010 to the 2017 CoARC accreditation standards, there is no way to determine how graduates from an associate degree program compare to graduates from a baccalaureate program other than by NBRC scores. Nonetheless, it is known that baccalaureate graduates score higher on NBRC RRT exams.<sup>5</sup> The 2016 Taskforce executive summary concludes that failure to obtain these competencies directs the profession to identify that, there are gaps in meeting the demands of delivering patient care safely in critical care areas and for disease management, thereby patients will not be receiving the respiratory therapy that they expect and deserve.<sup>5</sup>

## References for Appendix 2

1. Accreditation Standards for Entry into Respiratory Care Professional Practice <https://coarc.com/Accreditation/Entry-into-Practice-Standards.aspx> (Accessed January 3, 2019).
2. Prahalad, CK, Hamel, G. The core competence of an organization. *Harvard Business Review* 1990;68 (3):79–91.
3. Barnes TA, Gale DD, Kacmarek RM, Kageler WV. Competencies needed by graduate respiratory therapists in 2015 and beyond. *Respir Care* 2010;55(5):601-616.
4. Executive Summary: Competencies for Entry into Respiratory Care Practice. <https://www.aarc.org/wp-content/uploads/2017/02/respiratory-care-competencies.pdf> (Accessed October 31, 2018).
5. Effects from Education Program Type on RRT Candidate Outcomes: A study conducted by the NBRC. 2010.