



# Entry to Respiratory Therapy Practice 2030

## Introduction

The practice of respiratory therapy has evolved from the days of oxygen therapy, arterial blood gas interpretation, and nebulizer therapy. Current practice requires respiratory therapists to have extensive assessment abilities and practice competencies to initiate and provide cardiopulmonary interventions for their patients across a broad scope of practice and in a variety of patient care venues. Ultimately, the goal of the respiratory therapy educational system and state licensure process is to prepare competent respiratory therapists to provide safe and effective patient care in an increasingly complex health care environment.

The adequacy of the associate degree as the minimum educational preparation for respiratory therapists and entry to practice has been questioned for many years. 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.<sup>1</sup> An attached table provides a summary of published evidence supporting the implementation of baccalaureate education. (See Appendix 1)

Since 2010, there have been calls for needed changes to meet the goals recommended by the Respiratory Care in 2015 and Beyond conferences.<sup>2,4</sup> (See link: [AACRC 2015 and Beyond](#).) Stakeholders 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. In 2018 the AARC Board of Directors decided to act upon the recommendations needed to achieve the outcomes endorsed by the Respiratory Care in 2015 and Beyond conferences. The AARC asserts that a minimum of a baccalaureate degree in respiratory therapy, or health sciences with a concentration in respiratory therapy, is essential to meet minimum competency requirements to enter practice.

The AARC has engaged relevant stakeholders in an effort to embark on a collaborative initiative to mandate that all respiratory therapists entering practice in the year 2030 and thereafter have the minimum of a baccalaureate degree and

the National Board for Respiratory Care's (NBRC) Registered Respiratory Therapist (RRT) credential. This is important, not only to meet the increasing level of expertise required for current practice, but also to ensure patient safety and the efficient delivery of effective patient care as the scope of practice continues to evolve to meet future needs.

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 for entry to practice.

## Background

Respiratory therapy emerged in the 1950's and 60's due to a need for the delivery of specialty care for hospitalized patients. Since the early stages of oxygen therapy administration, the field has continued to evolve and fill the unmet and increasingly complex therapeutic needs of individuals with cardiopulmonary impairment. This evolution

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has included a change in name from oxygen technician to respiratory therapist, and the education requirements changed from on-the-job training to hospital-based certificate programs, and then to college-based associate degree programs. Baccalaureate and master's degree educational programs and internships are now available and provide additional opportunities for entry to practice and degree advancement. Professional practice has also advanced and now requires respiratory therapists to achieve national credentialing and licensure to practice in 49 states, the District of Columbia and Puerto Rico. (See link: [State](#)

[Licensure Information.](#)) Meeting patients' needs and providing safe and effective care have served as the driving-forces behind these advances.

In 2007, the AARC convened a meeting of stakeholders to identify evolving needs of patients with cardiopulmonary diseases. Patient advocacy and provider groups spoke to their needs and asked respiratory therapists to step up and close the identified gaps in the efficient delivery of safe and effective patient care. From this meeting Kacmarek, et al, summarized the background on the issues, and the process used to develop the characteristics of the respiratory therapist of the future, which became known as Respiratory Care in 2015 and Beyond.<sup>2</sup>

From 2008 to 2010 the AARC conducted two additional conferences to envision and discern the future practice of respiratory therapy. Conference participants 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 2030 and a justification of mandating these changes.

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 increases, 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 (See link: [Competencies for Entry to Respiratory Therapy Practice](#)) are separated into two categories -- 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>

Today, the profession has seen the fruition of the non-traditional roles for respiratory therapists foreseen by those participating in the consensus conferences. The profession recognizes the need for cost-containment and challenging the status quo. Respiratory Therapists must progress in improving patient safety and the efficacy of 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 in baccalaureate level programs that include general education as well as the basic and 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 in health care, and (4) critiquing, participating in, and leading research to develop new therapeutic options for diseases and determine how they are related to growing lists of co-morbidities and environmental challenges. Working in health care today requires respiratory therapists to critically think and analyze situations, and make critical decisions quickly and efficiency. Respiratory therapists must be committed to lifelong learning and delivering therapies that are grounded in evidence-based practice.

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

Critical thinking in daily respiratory therapy practice involves the ability to prioritize, appropriately respond to both 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>4,5</sup> To develop these skills, structured laboratory time (including simulation) and clinical time is needed in order to learn and refine the application of knowledge with a problem based learning methodology.<sup>6-11</sup>

Respiratory therapy education programs have three distinct components – didactic, laboratory, and clinical – that must be sufficient for students to acquire the knowledge and competencies as they prepare for entry to the profession. The lecture format predominantly provides new information and concepts, and is a passive learning style where the student is often left to independently analyze and synthesize this new knowledge. The laboratory classes and clinical hospital rotations are essential to develop skills in the practical application of the didactic knowledge as well as with development of critical thinking and decision-making skills.

The complexity, volume, and depth of knowledge and skills needed to deliver high quality, safe and effective respiratory therapy has grown exponentially in the last two decades. Respiratory therapy educational programs are under constant pressure to increase the content provided to their students to prepare them for safe and effective practice in the modern health care environment. Over the years, respiratory therapy educational programs have increased the number of required credit hours in an attempt to address the need for more in-depth training. However, institutional accreditors and governmental rules and regulations have limited to the maximum number of credits which may be awarded for a given degree.

The 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>12,13</sup> Additionally, there is a growing body of evidence that nurses with a baccalaureate degree in nursing (BSN) provide an improved quality and safer care with a direct correlation to a reduction in mortality as compared to those with an associate degree.<sup>14,23</sup>

The improvement in critical thinking skills is attributed to the broad general education, liberal arts and basic science course work required for the baccalaureate or graduate degree, and the extended laboratory and clinical time used to expand critical thinking and critical decisionmaking 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 effectively provide patient care. These aptitudes are assessed by the NBRC's RRT exams (Therapist Multiple Choice and Clinical Simulation) and respiratory therapy baccalaureate degree programs have consistently demonstrated a higher mean RRT credentialing success rate when compared with their associate degree program counterparts over the past several years. The CoARC's 2018 report on accreditation identified a 87.6% mean RRT credentialing success rate for baccalaureate degree programs compared to a 78.9% mean for associate degree programs.<sup>24</sup> This demonstrates the need to advance the education requirement for respiratory therapy students to a minimum baccalaureate degree.

According to a study conducted by Varekojis, 70.6% (total n = 70) of Respiratory Therapy Department hiring officials responding indicated they prefer to employ respiratory therapists with a baccalaureate degree. 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.<sup>25</sup> This is consistent with the 2015 and Beyond Task Force findings which identified the competencies that were expected for the safe, effective, and efficient practice of a respiratory therapist. The task force found that in the then current health care environment certain competencies could best be obtained through the completion of a baccalaureate degree.<sup>4</sup> In order to provide quality patient care, improve health care outcomes, eliminate unnecessary care and improve patient safety, the proposed changes must be implemented.

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 and others yet to arise will be difficult to achieve. Fortunately, data reported by the CoARC indicates that approximately 45% of the currently accredited associate degree respiratory therapy educational programs are either qualified to offer both the entry into practice associate degree and the baccalaureate degree, or may be able to transition to a baccalaureate degree program at their current institution. The remaining associate degree programs may be capable of articulating with baccalaureate degree granting institutions.<sup>26</sup>

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

The assessment of critical thinking and decision making is already incorporated into the RT examination. All CoARC approved respiratory therapy educational programs must incorporate the minimum competencies for NBRC's RRT credential eligibility in their curriculum. Accordingly, achievement of the RRT credential will confirm that program graduates have attained the critical thinking and decision making skills required of a respiratory therapist. Therefore, moving forward, the option to enter practice based on achieving the NBRC's Certified Respiratory Therapist (CRT) credential will not be sufficient and therefore obsolete.

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

The purpose of licensure in each state is two-fold -- protecting the health care consumer (citizens 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, and fingerprinting, as well as educational and credentialing requirements. The scope of practice, established in state licensure laws, identifies the minimum standards and areas of competency a licensee is expected to demonstrate in order to safely practice.

Due to the extensive efforts of the CoARC and the NBRC, education standards and credentialing requirements for respiratory therapists are standardized throughout the country. Laws have been amended to reflect these established standardized requirements and 49 states, the District of Columbia and Puerto Rico currently require some form of licensure. 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, since 2015 some states have transitioned their licensure requirements to the NBRC's RRT credential to ensure the health and welfare of the consumer. (See link: [States with RRT Entry for Licensure](#).) 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](#)) An organized effort is necessary to convert to the RRT licensure requirement in practice and perhaps facilitate reciprocity among the states for licensure.

## CONCLUSION

A coordinated initiative by stakeholders is needed to attain the proposed requirements of a minimum of a baccalaureate degree in respiratory therapy, or health sciences with a concentration in respiratory therapy, and the RRT credential for entry to practice as a Respiratory Therapist. These two requirements are needed to achieve consistency in practice and the provision of safe, efficient, and effective care to individuals with cardiopulmonary impairment or disease requiring respiratory therapy services.

The AARC Board of Directors intends these proposed requirements for entry to practice to be implemented for Respiratory Therapists newly entering active practice beginning in 2030 and thereafter. Grandfather clauses to accommodate practitioners credentialed, and having an active license in good standing to practice, prior to the implementation of the proposed requirements will be encouraged and supported by the AARC. However the licensure process will be dependent on state regulations.

## References

1. Effects from Education Program Type on RRT Candidate Outcomes: A study conducted by the NBRC. 2010. [https://www.aarc.org/wpcontent/uploads/2013/07/nbrc\\_program\\_study.pdf](https://www.aarc.org/wpcontent/uploads/2013/07/nbrc_program_study.pdf). (Accessed October 31, 2018).
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. Barnes TA, Kacmarek RM, Kageler WV, Morris MJ, Durbin CG. Transitioning the respiratory therapy workforce for 2015 and beyond. *Respir Care* 2011;56(5) 681-690.
5. Mishoe, SC. Critical thinking in respiratory care practice: A qualitative research study. *Respir Care* 2003;48(5):500-516.
6. Neufeld VR, Barrows HS. The "McMaster Philosophy": an approach to medical education. *J Medical Education* 1974;49(11):1040-1050.
7. Mishoe SC. Critical Thinking, Educational preparation and development of respiratory care practitioners. *Distinguished Papers Monograph* 1993;2(1):29-43.
8. Mishoe SC, MacIntyre NR. Expanding professional roles for respiratory care practitioners. *Respir Care* 1997;42(1):71-91.
9. Mishoe SC, Hernlen K. Teaching and evaluating critical thinking. *Respir Care Clin N Am* 2005;11(3):477-488.
10. Hay PJ, Katsikitis M. The expert in problem-based and case-based learning: necessary or not? *Med Educ* 2001;35(1):22-26.
11. Beachey W. A comparison of problem-based learning and traditional curricula in baccalaureate respiratory therapy education. *Respir Care* 2007;52(11):1497-1506.
12. Hill TV. The relationship between critical thinking and decision-making in respiratory care students. *Respiratory Care* 2002;47(5):571-577.
13. Clark M. Critical thinking in respiratory therapy students: comparing baccalaureate and associate degree students, 2012 ProQuest LLC, Ph.D. Dissertation, Capella University 135
14. 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.
15. 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.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. McHugh MD, Kelly LA, Smith HL, Wu ES, Vanak JM, Aiken LH. Lower mortality in magnet hospitals. *Medical Care* 2013;51(5):382-388.
22. 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.
23. Djukic M, Stimpfel AW, Koyner C. Bachelor's degree nurse graduates report better quality and safety educational preparedness than associate degree graduates. *It Comm J Qual Patient Saf* 2018 Oct 15 (E-pub ahead of print)
24. Commission on Accreditation for Respiratory Care. 2018 Report on Accreditation in Respiratory Care Education. June 1, 2019:80. (link: [2018 Report on Accreditation](#). Accessed August 9, 2019)
25. 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.
26. Commission on Accreditation for Respiratory Care. 2018 Report on Accreditation in Respiratory Care Education. June 1, 2019:86. (link: [2018 Report on Accreditation](#). Accessed August 9, 2019)

### **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 Therapy 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](#)

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## APPENDIX 1: SUMMARY OF PUBLISHED EVIDENCE FOR BACCALAUREATE EDUCATION

Bibliography Appendix				
	Source/Citation	Author(s)	Title	Summary/Main Points
1	Respiratory Therapy 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	Respiratory Care 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	Distinguished Papers Monographs 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	Respiratory Care September 1993, 38(1): 1014-9.	Douce FH, Cullen DL	The Length of Educational Preparation and Academic Awards for Future Respiratory Care Practitioners:	Delphi process, which reports that increasing program length, may be necessary if competencybased education becomes a reality.
5	Respiratory Care 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	Respiratory Care 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	Journal of Allied Health, 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.

8	Respiratory Care 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.
9	Respiratory Care 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.
10	Respiratory Care, 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.
11	Respiratory Care Education Annual, Vol. 12, Fall 2003: 11-19.	Becker E.	Point of View: Promoting Baccalaureate Completion Among Respiratory Therapists	Review of literature for reprofessional- ization of education and proposes a 2-stage model for moving to BS entry.
12	Respiratory Care Education Annual, 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.
13	Respiratory Care 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.
14	Respiratory Therapy 2006;1(5):29-36]	Clark K	Teaching Outside the Box: A Constructivist Approach to Facilitating Critical Thinking in Respiratory Therapy Education	Constructivism: active view of learning in which learner constructs knowledge by connecting new information to previous knowledge and experience. Approaches include inquiry-based, problem-based, and research-based learning methods.

15	Respiratory Care 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 Respiratory Care and that the profession has evolved from "respiratory care practitioners" to "respiratory therapists."
16	Respiratory Care 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	Respiratory Care 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	Respiratory Care 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	Respiratory Care. December 2011; 56(12):1906-15.	Kacmarek RM, Barnes TA, Durbin CG Jr.	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	Respiratory Care 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, healthcare policy, and advanced practice models.



21	Respiratory Care 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</i> Annual, 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	Respiratory Care Education Annual 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	Journal of Research and Practice, 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	Respiratory Care 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	Respir Care 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 elements of the foundational underpinning for the strategies that will move the profession forward.
27	Respiratory Care. 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 entrylevel baccalaureate degree will decrease the diversity of the respiratory therapist workforce.

28	<i>Respiratory 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>Respiratory 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>Respiratory 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</i> Annual 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 evidencebased RT. Belief that this trend will continue due to evolving RT practice and changing health care environment.
32	<i>Respiratory Care</i> . October 2018 63(10): 1207-1213.	Becker EA, Vargas J.	Communication of Career Pathways Through Associate Degree Program Web Sites: A Baseline Assessment	ASRT program websites often lacked reference to pursuing a baccalaureate degree, and information about transfer credits and articulations agreements. RTs need to know the differences in degree type (Bachelor of Science vs. Bachelor of Applied Science).
33	<i>Respiratory 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>Higher Education Policy</i> , September 2018, 31: 359-380.	Hu X., Ortagus J.C. Kramer D.A	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	Respiratory Care 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, Kanneurff 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.
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**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 Health Sciences Reasoning Test (HSRT) total scores but no differences seen between BS and AS for HSRT subscale scores.

## APPENDIX 2: COMPARISON OF CURRENT THE COMMISSION ON ACCREDITATION FOR RESPIRATORY CARE (COARC) GUIDELINES TO COMPETENCIES FROM THE 2015 AND BEYOND CONFERENCES

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>

The 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 interprofessional 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. The 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, the 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<sup>3</sup> 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/CoARC/media/Documents/CoARC-Entry-Standards-1-1-18.pdf>. (Accessed November 4, 2018).
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.