



The Jimmy A. Young Memorial Lecture

June 27, 2017
8:00 am to 9:30 am
Tucson, AZ



The NBRC has honored Jimmy's memory and the contributions he made to respiratory care through this program since 1978

Jimmy Albert Young, MS, RRT
1935 –1975



Jimmy Albert Young, MS, RRT was one of the profession's most outstanding and dedicated leaders

In a 15-year career, Jimmy

- achieved the RRT
- directed an education program
- directed a hospital department
- served as AARC President
- served as an NBRC trustee
- 1935 – born in South Carolina
- 1960 – 1966 – served as Chief Inhalation Therapist at the Peter Bent Brigham Hospital, Boston
- 1965 – earned the RRT credential, Registry #263
- 1966 – 1970 – served in several roles including director of the education program at Northeastern University, Boston
- 1970 – became director of the Respiratory Therapy Department at Massachusetts General Hospital, Boston
- 1973 – became the 22nd President of the American Association of Respiratory Care
- 1975 – was serving as an NBRC Trustee and member of the Executive Committee when he passed away unexpectedly



2017 Session

- Specialists Reveal Details about their Practices in Adult Critical Care and Neonatal / Pediatric Care
 - Results from two 2016 job analysis studies



Presenters

- Robert L. Joyner Jr., PhD, RRT, RRT-ACCS, FAARC
 - NBRC President
- Robert C. Shaw Jr., PhD, RRT, FAARC
 - NBRC Assistant Executive Director, Examinations Director and Psychometrician



Conflict of interest disclosures

- We have no real or perceived conflicts of interest related to this presentation.
- Uses of brand names are not meant to endorse a product, but rather to illustrate a general point.
- Robert Shaw is employed by the NBRC.



Learning objectives

- Outline methods deployed during job analysis studies for the adult critical care and neonatal / pediatric specialties.
- Describe results from each study including the new set of design specifications for each examination.
- Highlight content changes expected for each examination.



Organization of the presentation

- **Why** do these studies?
- **Who** guided these studies?
- **When** did study milestones occur during 2016?
- **What** methods were used to reach respondents?
- **What** results were observed during these studies . . .?
- **How** were critical tasks identified?
- **Did** a committee add content?
- **When** will examination changes occur?



Why do these studies?

- Systematically maintain examination content that relates to the role of a specialist by studying practice every several years
- Satisfy external expectations because an occupational credential is at stake
 - Standards for accreditation by the National Commission of Certifying Agencies 2016
 - Standards for Educational and Psychological Testing *by the AERA, APA, NCME 2014*
 - Guidelines in the Code of Federal Regulations, title 29 Department of Labor (Equal Employment Opportunity Commission) Part 1607 – Uniform Guidelines on Employee Selection Procedures 1978
 - Legal precedents as in results from the supreme court case called Griggs v Duke Power Company 1970
 - Law as in the Civil Rights Act 1964



Who guided these studies?

ACCS Advisory Committee

Board members

- May, OH, Chair
- Balk, IL, Vice-Chair
- George, IA
- Johnson, NJ
- Kaplan, MO
- Nicholau, CA
- Prough, TX
- Siobal, CA

Consultants appointed by NBRC

- Brooks, TN
- Robinson, CO

Consultant appointed by AARC

- Roberts, CA

NPS Advisory Committee

Board members

- Napoli, NJ, Chair
- Fedor, OH, Vice-Chair
- Barnhart Stadter, AR
- Sinkin, VA
- Stayer, TX

Consultants appointed by NBRC

- Berlinksj, AR
- Ellis, SC
- Evans, IL
- Evey, TX

Consultant appointed by AARC

- Kuch, PA



When did study milestones occur - 2016?

- Spring meetings to make sampling plans and draft content of surveys
 - ACCS, April 13
 - NPS, April 14
- Pilot survey phase
 - ACCS, May
 - NPS, May
- Survey windows
 - NPS, opened June 24, reminders August 1 and August 8, closed August 15
 - ACCS, opened July 8, reminders August 29 and September 5, closed September 12
- Fall meetings to evaluate respondents' demographics and quality of task ratings, followed by decisions about examination content and design
 - ACCS, November 16
 - NPS, November 17



What methods were used to reach respondents?

- **ACCS – N = 5,847**
 - Direct email to populations
 - 1,910 credential holders who had a valid address in database
 - 815 PDs and DCEs from CoARC accredited education programs
 - Email blast
 - 1,620 members of AARC Adult Acute Care section
 - 1,450 members of AARC Management section
 - Direct email to 52 identified by another survey respondent
- **NPS – N = 14,516**
 - Direct email to population (11,164) of credential holders who had a valid address in database
 - Email blast
 - 133 members of the Children’s Hospital Association
 - 1,722 members of AARC Neonatal-Pediatrics section
 - 1,450 members of AARC Management section
 - Direct email to 47 identified by another survey respondent



What results were observed during these studies about the number of responses and response rate?

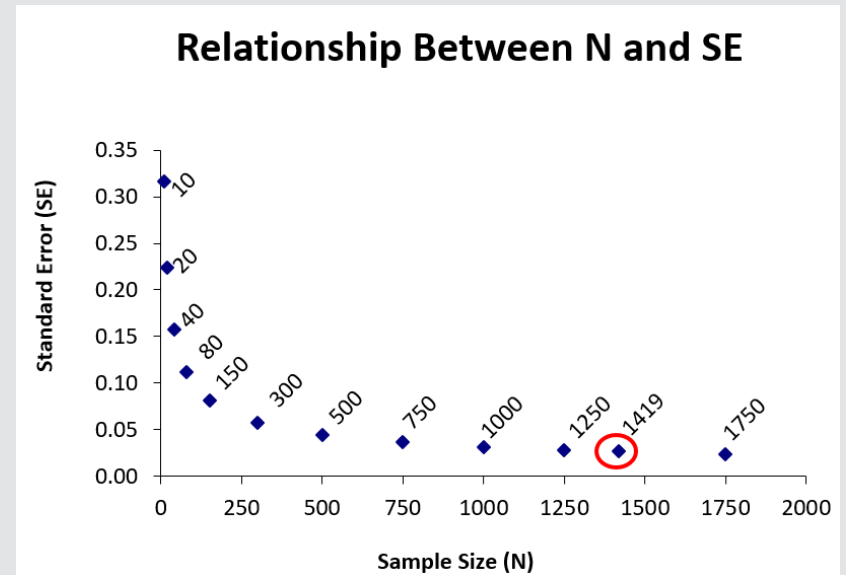
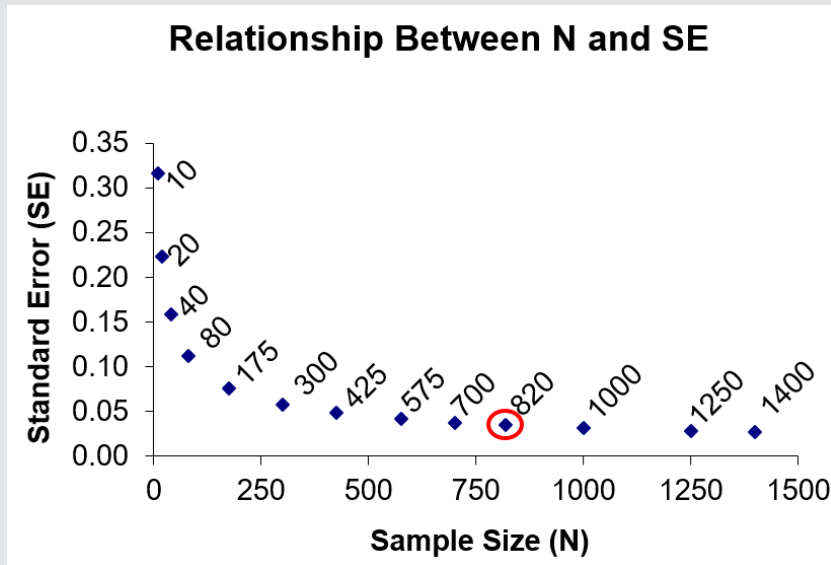
- Number of completed survey response sets
 - ACCS, 820
 - NPS, 1,419
- Percentage of potential respondents who participated
 - ACCS, 14.3
 - NPS, 11.5



What results were observed during these studies about the relationship between sample size and measurement error?

ACCS

NPS



What results were observed during these studies about the reliability of observations?

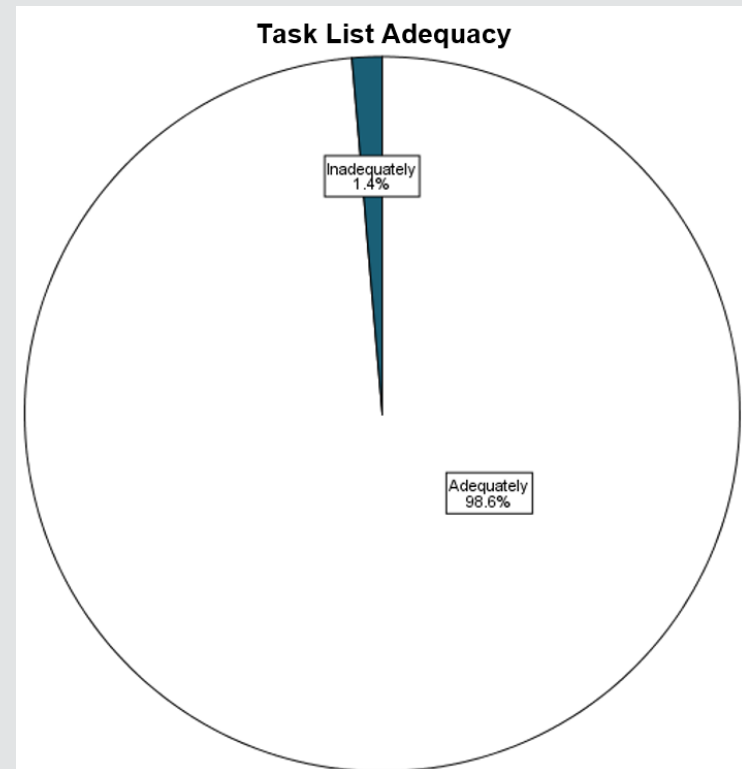
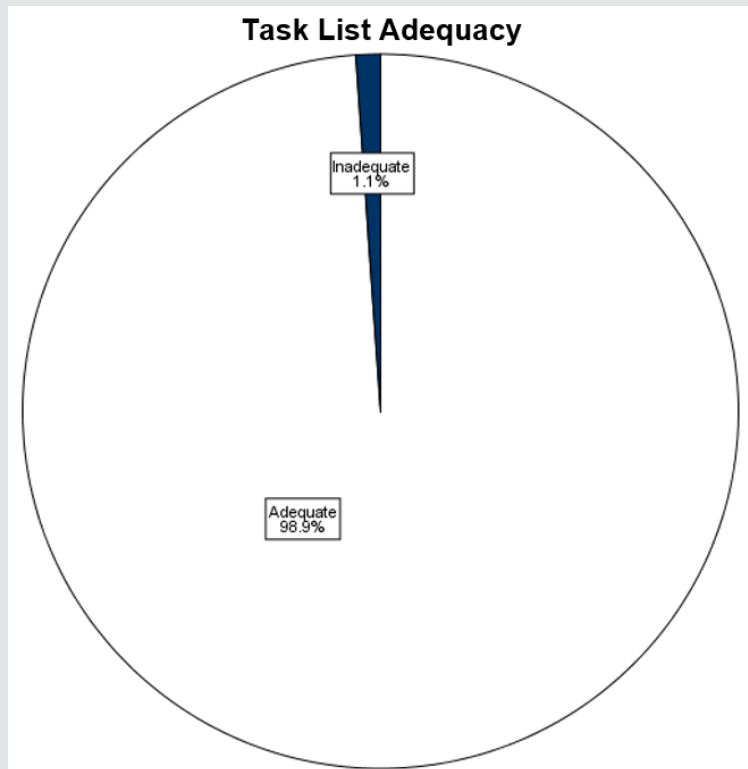
Survey Sections	Number of Tasks	Reliability between tasks	Reliability between respondents
ACCS N=820			
I. RESPIRATORY CRITICAL CARE	29	.902	.997
II. GENERAL CRITICAL CARE	91	.977	.996
Total	120		
NPS N=1,419			
I. COMPETENCIES SHARED BETWEEN CRITICAL AND GENERAL CARE	55	.954	.998
II. COMPETENCIES SPECIFIC TO CRITICAL CARE	49	.942	.998
Total	104		



What results were observed during these studies about the adequacy of each task list in covering each role?

ACCS

NPS



What results were observed during these studies about respondents' demographics?

- ACCS
 - 59% had achieved the RRT-ACCS
 - 67% worked at a tertiary referral center
 - 59% worked at a metropolitan urban or suburban hospital
 - 57% were female
 - 36% worked in a facility containing at least 60 ICU beds
 - On average,
 - respondents had 11 years of experience in adult critical care



What results were observed during these studies about respondents' demographics?

- NPS
 - 91% had achieved the CRT-NPS or RRT-NPS
 - 80% worked where therapists attend high-risk deliveries
 - 73% worked in a teaching or university facility
 - 65% were female
 - 37% worked in a free-standing children's hospital while 31% worked in a children's division of a general hospital
 - On average
 - respondents had 15 years of experience in neonatal or pediatric patient care
 - facilities had 134 beds



What results were observed during these studies about the confidence of each advisory committee in using survey responses?

- Each committee expressed high confidence in using survey responses as guides while deciding what content to assess and how to design examinations in the future
 - Quality of data was high
 - sample size
 - reliability
 - task list adequacy
 - No surprising demographics



How were critical tasks identified?

- A credentialing examination should focus on critical content, not trivial or peripheral content
 - In truth, there is a criticality continuum, but the method forces a dichotomous (in or out) decision necessary to protect the public
- Criticality criteria
 - Extent in the practices of the whole sample
 - % of respondents who affirmed a task was done in his or her facility
 - Importance to practices within the whole sample
 - mean value on a 4-point scale
 - Means of importance ratings for sample subsets
 - 2, 3, 4, 5, or 6 subgroups depending on the subset



How were critical tasks identified?

- Task exclusion rules

Study	Extent in whole sample	Mean importance in whole sample	Mean importance across subgroups (n of subgroup sets)
ACCS	50%	2.50	2.50 (11)
NPS	50%	2.50	2.50 (12)

Examples of subgroup sets

Regions	Number of beds
Work settings	Highest academic degree
Hospital type	Primary job
Specialty credential holder	Experience



What results were observed during these studies about the quantity of critical tasks to which future items will be linked?

Study	Tasks in the list	Excluded tasks	Critical tasks
ACCS	120	0	120
NPS	104	1	103



- I. COMPETENCIES SHARED BETWEEN CRITICAL AND GENERAL CARE
 - I. Manage Care Based on Nutritional Status
 3. Metabolic study (for example, caloric requirements, exhaled gas analysis)

Did either committee write a task out of the list during the first meeting when survey content was drafted?

- No, but some task statements were rewritten before survey responses were collected



Did the ACCS committee add content that was subsequently observed to be critical?

- Manage specialty endotracheal tubes, for example subglottic suction, wire-reinforced, double lumen
- Manage ventilation/oxygenation during
 - rescue with extracorporeal life support
 - exercise and rehabilitation while receiving ventilatory support
 - PEEP management, for example mild hypoxemia, severe hypoxemia
- Optimize aerosol delivery, for example during mechanical ventilation, NPPV, high flow nasal cannula
- Assess patient during therapeutic hypothermia, for example targeted temperature management, methods, indications and contraindications, complications



Did the ACCS committee add content that was subsequently observed to be critical?

- Anticipate care based on lab results
 - Albumin
 - Non-cardiac biomarkers
 - Endocrine assessment
 - Liver function
- Prevent ventilator-associated events by assessing endotracheal / tracheostomy cuff integrity and pressure
- Perform procedures with an esophageal probe, for example transpulmonary pressure, NAVA



Did the NPS committee add content that was subsequently observed to be critical?

- Anticipate care based on toxicology, for example drug overdose, neonatal abstinence syndromes
- Manage ventilation and oxygenation through alternative modes, for example volume-targeted, APRV, NAVA
- Monitor
 - ventilator waveforms, for example NAVA catheter positioning
 - cerebral oximetry, for example near infrared spectroscopy
- Facilitate therapeutic hypothermia, for example total body / head cooling, passive / active cooling
- Prevent device-related pressure ulcers



Content & Cognitive Level Specifications

Items can be linked to open cells



ACCS Content Area	Items				Totals
	Ethics	Cognitive Level			
		Recall	Application	Analysis	
I. RESPIRATORY CRITICAL CARE		3	17	39	59
A. Manage Airways		1	4	5	10
B. Administer Specialty Gases		1	1	1	3
C. Manage Ventilation/Oxygenation		0	8	28	36
D. Deliver Pharmacologic Agents		1	4	5	10
II. GENERAL CRITICAL CARE		6	31	54	91
A. Assess Patient Status and Changes in Status		0	7	24	31
B. Anticipate Care Based on Laboratory Results		1	2	5	8
C. Anticipate Care Based on Imaging and/or Reports of Imaging		1	2	5	8
D. Anticipate Effects of Pharmacologic Agents		1	4	7	12
E. Anticipate Care Based on Nutritional Status		1	1	2	4
F. Prevent Ventilator-Associated Events		1	4	1	6
G. Recognize and Manage Patients with Infections and/or Sepsis		0	3	3	6
H. Manage End-of-Life Care		0	2	2	4
I. Prepare for Disaster and Mass Casualty Events		1	1	1	3
J. Interact with Members of an Interdisciplinary Team		0	1	1	2
K. Perform Procedures		0	2	1	3
L. Troubleshoot Systems		0	2	2	4
Total	5	9	48	93	150

58

92

current 5 12 45 93

Content & Cognitive Level Specifications

Items can be linked to open cells



NPS Content Area	Items				Totals
	Ethics	Cognitive Level			
		Recall	Application	Analysis	
Current GENERAL CARE					
I. COMPETENCIES SHARED BETWEEN CRITICAL AND GENERAL CARE		10	32	17	59
A. Assess Patient Information		1	5	7	13
B. Evaluate Pulmonary Status		0	1	1	2
C. Assess and Manage Airways		1	2	0	3
D. Select and Manage Equipment		1	6	0	7
E. Facilitate Procedures and Evaluate Efficacy		1	2	0	3
F. Manage and/or Anticipate Effects of Medication Administration		1	5	4	10
G. Anticipate Care Based on Laboratory Results		1	3	2	6
H. Anticipate Care Based on Imaging and/or Reports of Imaging		0	1	2	3
I. Manage Care Based on Nutritional Status		1	1	0	2
J. Assist With or Perform Resuscitation		1	1	0	2
K. Prepare for Disaster and Mass Casualty Events		1	2	0	3
L. Interact with Members of an Interdisciplinary Team		0	1	1	2
M. Evaluate Patient and Family Understanding of Education		1	2	0	3
II. COMPETENCIES SPECIFIC TO CRITICAL CARE		4	29	28	61
A. Evaluate Pertinent Information		1	2	1	4
B. Assess and Manage Airways		0	6	2	8
C. Manage Specialty Gas Administration		0	2	2	4
D. Manage Ventilation and Oxygenation		1	7	16	24
E. Facilitate Procedures and Evaluate Efficacy		1	4	4	9
F. Manage and/or Anticipate Effects of Medication Administration		0	2	1	3
G. Prevent Hospital-Acquired Conditions		1	4	1	6
H. Manage End-of-Life Care		0	2	1	3
Totals	3	14	61	45	120

45

75

current 3 9 61 50

What results were observed during these studies about the prevalence of patient's conditions

- Survey questions
 - ACCS – How often do respiratory therapists in your institution provide care to adults with conditions or disorders in the following categories?
 - ARDS
 - Bariatric
 - Cardiac
 - .
 - .
 - NPS – In the past year, how often did respiratory therapists in your institution provide care to neonatal or pediatric patients with conditions or disorders in the following categories?
 - Asthma
 - Bronchiolitis
 - Congenital defects that require surgical correction
 - .
 - .



What results were observed during these studies about the prevalence of patient's conditions

- Conditions observed to be linked to (1) larger percentages of respondents' practices, which occurred with (2) greater frequency in a year were considered to be higher in **prevalence**.
 - Conditions observed to be higher in prevalence will be emphasized more among items on these examinations



ACCS Patients' Conditions Specifications

Conditions or Disorders	Item Counts Across the Examination		
	Target	Acceptable Range for Each Test Form	
		Minimum	Maximum
General (No specific condition or disorder)	32	26	38
ARDS	15	11	19
COPD	13	10	16
Cardiac	12	9	15
Post-Surgical	11	8	14
Asthma	11	8	14
Trauma	9	6	12
Infection / Sepsis	8	6	10
Pulmonary Embolism	7	5	9
Shock	6	4	8
Bariatric	5	3	7
Neurologic / Neuromuscular	5	3	7
Pulmonary Hypertension	4	2	6
Geriatric	3	2	4
Immunocompromised	3	2	4
Psychiatric	2	1	3
Massive Hemoptysis	1	1	2
Burn / Inhalation Injury	1	0	2
Cystic Fibrosis	1	0	1
Transplantation	1	0	1
Total	150		



NPS Patients' Conditions Specifications

Condition or Disorder	Item Counts Across the Examination		
	Target	Acceptable Range for Each Test Form	
	120	Minimum	Maximum
GENERAL – No specific condition or disorder	29	24	34
NEO PULMONARY (Neonatal pulmonary, for example, meconium aspiration, pneumonia, PPHN)	9	7	11
INFECT DISEASE (Infectious disease, for example, pneumonia, croup)	9	7	11
CHRONIC LUNG (Chronic lung disease of prematurity)	9	7	11
ASTHMA	9	7	11
PREMATURITY (Prematurity acute phase, for example, surfactant deficiency apnea)	9	7	11
BRONCHIOLITIS	7	6	8
CON DEFECTS (Congenital defects that require surgical correction)	5	3	7
CON HRT DISEASE (Congenital heart disease)	5	3	7
NEUROLOGIC (for example, seizures, brain tumors, hydrocephalus)	5	3	7
PED AIRWAY (Pediatric airway, for example, tracheomalacia, vocal cord paralysis, vascular ring)	3	2	4
IMMUNOCOMPROMISED	3	2	4
SHOCK	3	2	4
TRAUMA	3	2	4
HEART FAILURE	3	2	4
CYSTIC FIBROSIS	3	2	4
NEUROMUSCULAR (for example, spinal muscle atrophy, muscular dystrophy)	3	2	4
SLEEP RELATED (sleep related disorders, for example, obstructive sleep apnea, central hypoventilation)	2	1	3
INHALATION (Inhalation injuries)	1	0	1
Total	120		



When will examination changes occur?

- ACCS
 - June 27, 2018
- NPS
 - October 10, 2018
- Transitions are expected to occur **WITHOUT** a disruption in the delivery of instant results to candidates.





Study Summaries



Summary

- These studies were done because they were the right thing to do, so external agencies expect them to be done.
- Committees of therapists and physicians who were board members and consultants to committees guided these studies.
- Surveys were created during the early months of 2016; data were collected during the summer months; decisions about the content and designs of examinations were made in the fall
- NBRC, CoARC, and AARC worked together to reach potential respondents.
- Samples were sufficiently large to expect minimal error in mean and percentage calculations.



Summary

- Each tasks list adequately covered each role and task ratings were sufficiently reliable.
- Demographic results presented no surprises.
- The confidence of each committee was high in using survey results to guide decisions about examination content and design.
- Some new content will appear on each examination.
- Examination design specifications have been revised.





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