



Education

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American Association for Respiratory Care

Notes from the Chair

by David W. Chang, EdD, RRT

Students tend to perform up to the level that we expect them to achieve. If we expect them to recall facts, they will.

When my children were still young enough to ask for help, they often asked me to help them prepare for their exams. In some cases their teachers prepared a study guide for the exam (a good thing). On one occasion, however, I was dismayed to see that almost all of the items in the study guide were written to drill the student's ability to recall facts (a not-so-good thing). It's unfortunate that knowledge is sometimes equated to how much one remembers.

In a few more months, our graduates will be tested under the new NBRC exam matrices. As you are well aware, the major change in the new matrices involves the distribution of the cognitive knowledge levels that the examinees are required to achieve. In the written RRT exam, less emphasis will be placed on the recall (12%) and application (15%) levels and much more emphasis will be placed on the analysis level (73%).

While we should not "teach the test," a little "conditioning" can help our students prepare for the new NBRC exams. Depending on the levels of cognitive learning, test items that contain terms such as "list, name, or state" usually require a person to recall certain simple or basic facts, while test items that contain words such as "describe, compare, explain, or differ" usually require a person to use the facts to apply the knowledge and analyze the problem.

The first of the three examples below is from a test bank. The other two questions have been revised from the first one to show how a simple concept can be used to test a student at three cognitive levels. The first question is a recall item on the Henderson-Hasselbalch equation. The student can answer this question correctly if he/she remembers that this equation is a pH equation or if he/she can write out the equation by recall. Correct answers are marked with an *.

- (1) The Henderson-Hasselbalch equation can be used to calculate the:
- A. pH *
 - B. carbonate acid
 - C. Na⁺ concentration
 - D. base excess

This question can be changed to the application level, as seen in No. 2. Unless the student has a superb memory of all the facts in a concept, he/she can answer this question correctly only if he/she can recall the equation *and* understand the relationship between PaCO₂, H₂CO₃, and pH in the equation.

- (2) In the Henderson-Hasselbalch equation, an elevated PaCO₂ would lead to a _____ pH.
- A. higher, higher
 - B. higher, lower *
 - C. lower, higher
 - D. lower, lower

1999 Calendar Deadline

Summer Forum (Phoenix, AZ).....July 16-18
 Respiratory Care Educational Annual: Paper deadline.....December 1

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This question can then be modified to the analytical level, as seen in No. 3. This question requires an understanding of the relationship between the three variables in the equation and the ability to correlate hypoventilation with an elevated PaCO2.

(3) A patient who is suffering from moderate hypoventilation would

cause a _____ H2CO3 and a _____ pH in the Henderson-Hasselbalch equation.

- A. higher, higher
B. higher, lower *
C. lower, higher
D. lower, lower

Most students tend to perform up to the level that we expect them to achieve. If we expect them to recall

facts, they will. And if we do that frequently enough, they will end up being a "walking fact book." It is time-consuming to come up with challenging questions in the classroom, as well as on exams, but it is time well spent. After all, good student outcome requires an investment of time and effort on our part as well as theirs. ■

Notes from the Editor

In a recent Education Digest message, I made a plea for contributions to the Bulletin. I also asked our readers to suggest topics for future Bulletin articles. Due to an interesting turn of

events (rather than my pleas) a request will be answered in this issue.

Among the messages that appeared on the Digest was one from Ray Sibberson, from Akron University, who recognized the instructional needs generated by the new NBRC entry-level examination matrix. Ray identified the new topics on the exam that require instructional adjustment, then finished his message as follows: "Could anyone help in providing resources for some of the above areas? Rather than each educator trying to re-invent the wheel, I thought I could compile some of the information I receive, and send it back out to the list."

Now comes the interesting part. Anticipating that this would be a topic on the minds of many educators, Dr. Tim Opt Holt presented a session on exam resources at our International Congress in November and graciously agreed to share some of that content with the section through an article in this issue of the Bulletin. Therefore,

Tim's foresight and diligence is providing timely information, not only for Ray Sibberson, but for the rest of us RC educators as well.

Another request came from Steve Bishop, RRT, who is the respiratory care program director at Ozarks Technical Community College in Springfield, MO. Steve would like to read about strategies to stimulate active involvement and thinking on the part of students. Also, he would like the readership to share particular instructional activities and mnemonic devices.

Assuredly, problem-based instruction is one strategy to develop active learning and inquiry among students. But some of our readers may have other specific strategies that also encourage learner activity. If you are one of them, please share your ideas. Also, anyone who has novel, innovative mnemonics, please share those as well. ■

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Resources and Curricular Implications of the New NBRC Examinations

by Tim Opt Holt, EdD, RRT, cardiorespiratory care program, University of South Alabama

Editor's Note: This article is based on a presentation at the 1998 AARC International Congress.

Beginning with the Entry Level Examination in July and the Advanced Practitioner Examination in December, we will be faced with the latest revisions of the NBRC's examination matrices, which include tasks not previously included on these examinations. At the AARC meeting in Atlanta, I presented this list of new tasks, information sources for these new tasks, and

some curricular implications or ways of incorporating these new tasks into the respiratory therapy curriculum. This article summarizes my presentation.

The following new tasks are included in the new examination matrices effective in 1999:

- A. Assess patients' learning needs
B. Develop quality improvement programs
C. Review interdisciplinary patient and family care plan

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- D. New airways: laryngeal mask and esophageal tracheal combitube
- E. CO, He, O₂, and specialty gas analyzers
- F. Flutter valve and SPAG devices
- G. Application of computer technology to patient management
- H. Communication of results of therapy per patient care protocols
- I. Use of newer bronchial hygiene techniques, including IPV and chest wall oscillation
- J. Independent lung ventilation
- K. Assisting physicians with percutaneous needle biopsy, chest tube insertion, line insertion, conscious sedation, and patient education and disease management programs.

Assessing patients' learning needs

Resources include:

- Training the healthcare professional for the role of patient and caregiver educator, AARC CPG 45
- Providing patient and caregiver training, AARC CPG 46
- Nicotine dependency evaluation and treatment, AARC IISP SC1
- Bedside counseling of the hospitalized smoker, AARC IISP SC2
- Dunlevy, CL. Patient education and health promotion. In: Scanlan CL, Wilkins RL, and Stoller JK, eds. *Egans Fundamentals of Respiratory Care*, 7th ed. St. Louis, Mosby, 1998: 1049-1059.

Curriculum implications: These issues may be placed in a caregiver education course and/or made a part of each case in a problem based learning (PBL) curriculum. Students may be placed with therapists responsible for nicotine dependency education or asthma education. These topics may also be included in a rehabilitation course.

Developing quality assurance programs

There were not any readily-available references or discussions of this topic in available respiratory therapy textbooks. I suspect that this topic will be treated in future editions. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) uses the ICARE acronym: *Identify* the problem, *Clarify* the problem (specifically), *Analyze* the problem (determine the cause of

problem; *Revise* existing policy, issue, or procedure), and *Evaluate* and educate. During my presentation, I suggested that the following elements, which follow along the same general lines as the JCAHO acronym, are essential to a quality assurance program:

- State the title of the service you are to provide
- List the goals of that service
- Determine how the outcomes of that service will be measured
- Inservice the service providers
- Perform the service
- Measure the outcomes
- Determine if the goals were met
- Determine how the service should be modified to better meet the goals

Examples of QA programs include:

- Quality Counts Computerized quality assurance tracking, AARC BK 36
- Lab Counts Integrated system for compliance with laboratory regulations, AARC BK 35

Curriculum implications: These issues may be placed in a management course. Have students assist affiliate department personnel in their QA documentation activities. Have students attend an affiliate hospital's QA committee meeting. Have students design a QA program in their management course modeled after their own experience in the clinical affiliate.

Interdisciplinary care plans

This was another area where readily-available resources were not available in respiratory therapy texts. However, the clinical pathways used in most hospitals provide an excellent framework for interdisciplinary care.

Resources include:

- Clinical pathways from clinical affiliates
- Determine and perform the roles of the therapist in each clinical pathway
- Discharge planning for the respiratory care patient, AARC CPG 38

Curriculum implications: This issue may be included in subacute care and education courses, and in each case of a PBL curriculum. Place students with discharge planners or case managers in clinical rotations, and consider inclusion of case management as part of the curriculum. Have students complete pathway forms and interdisciplinary education summaries as they initiate and continue therapy for patients on clinical pathways.

Laryngeal mask airway (LMA) and esophageal tracheal combitube (ETC)

Although the LMA and ETC are airways that have been in use for some time, this is the first time they have been included in the matrices. I found both in the hospital's anesthesiology department work room.

Resources include:

- An instruction book and video on the LMA are available free of charge from:
Gensia Inc.
9360 Towne Ctr. Dr.
San Diego, CA 91212
(800) 788-7999
- A free training video and training device for the ETC (manufactured by Sheridan) is available from:
Armstrong Medical
PO Box 700
575 Knightsbridge Parkway
Lincolnshire, IL 60069
(800) 323-4220
(The tube is \$50, and the training device is \$75 according to a recent catalog.)

Curriculum implications: Include these airways in an airway care course along with EOA and EGTA. Ask an anesthesiologist to demonstrate the use of the LMA. Include the combitube in a PBL case involving an emergency airway insertion. Consult with your local emergency medical technician program.

CO, He, O₂, and specialty gas analyzers

These analyzers have specific and specialized applications. There are numerous listings in the *AARC Times Buyer's Guide*, published annually in July. For example, I found a wealth of information on clinical application of CO, H, NO, and NO₂ monitors from:
Bedfont Scientific
30 Jackson Rd., Ste B-3
Medford, NJ 08055
800-457-5804
bedfont@bedfont-usa.com

Curriculum implications: Place CO analyzers with instruction on nicotine intervention. Use of NO is placed in a course on specialized ventilatory techniques. Hydrogen analysis is perhaps out of the respiratory therapist's role, as it is used for diagnosing gastrointestinal disorder.

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"Curricular Implications" continued from page 3

ers. Helium analyzer function is included in pulmonary function equipment courses.

Flutter valve

The Flutter is a device used to assist the patient with bronchopulmonary hygiene. An instructional video and clinical research articles are available on:

Scandipharm, Inc.
22 Inverness Center Parkway
Birmingham, AL 35242
(800) 950-8085

Curriculum implications: This information may be placed in a course on bronchial hygiene/basic therapy. Place in PBL case on cystic fibrosis. Have students teach the use of the flutter to patients during clinical rotations. Each Flutter comes with a video-tape. I have found this to be useful for both patient and caregiver education.

Small particle aerosol generator (SPAG)

Information on the SPAG may be found in:

Hess DR, Branson RD. Humidification: Humidifiers and nebulizers. In: Branson RD, Hess DR, and Chatburn RL. *Respiratory Care Equipment*. Philadelphia, Lippincott, 1995: 108-111.

Curriculum implication: This information may be placed in course on aerosol and humidity therapy/basic therapy. Place in PBL case on SV/bronchiolitis. Have students assemble the SPAG in laboratory session and in the clinical site when indicated.

Application of computer technology in patient care

Information on this issue may be found in:

Maxwell CI, Silage DA. Computers and respiratory care equipment. In: Branson RD, Hess DR, and Chatburn RL. *Respiratory Care Equipment*. Philadelphia, Lippincott, 1995: 501-518.

Curriculum implication: Place in management course. Place students in clinicals where they will use computers, such as computerized charting settings and pulmonary function labs. Acquaint the students with email, computerized literature searches, use of the

World Wide Web, word processing, and database/data analysis software.

Protocols

Information on this issue may be found in:

- Des Jardins T, Burton GG, Tietsort J. *Respiratory Care Case Studies: A therapist-driven protocol approach*. St. Louis, Mosby, 1997.
- Numerous articles in *Respiratory Care and AARC Times*.

Curriculum implications: The best way to have students learn about protocols is to have them actually work in a clinical setting where protocols are used. Have students become actively involved in patient assessment and reassessment. Protocols can be an important part of PBL cases.

Intrapulmonary percussive ventilation (IPV), chest wall oscillation

IPV and chest wall oscillation are relatively new therapies. Information on the theory and use of these techniques and devices are available from:

- Hess DR, Branson RD. Devices for chest physiotherapy, incentive spirometry, and intermittent positive pressure breathing. In: Branson RD, Hess DR, and Chatburn RL. *Respiratory Care Equipment*. Philadelphia, Lippincott, 1995: 259-260.
- A Clinical Manual Covering the Use of the Family of Intrapulmonary Percussionators, Percussionaire Corp. Sandpoint ID., 1997 (208) 263-2549. The complete manual for IPV procedure. Phil Fish, customer service.
- The Family of Intrapulmonary Percussionators, Percussionaire Corp. Form P75-93. A manual for the IPV (P-132-1A) and instructional video (VHS-1000) are available.
- Hyperinflation Therapy. In: White GC. *Basic Clinical Lab Competencies for Respiratory Care* 3rd ed. Albany, Delmar, 1998: 205-206, 211, 219-220.

Curriculum implications: These therapies are placed in a course on bronchial hygiene. Place in a PBL case on chronic bronchitis, cystic fibrosis, or atelectasis. Place students in cystic fibrosis clinic or on floors where CF children are cared for. Determine the use of these methods in clinical affiliates and utilize laboratory sessions. Since these procedures are relatively new, encourage senior students to

include these therapies in clinical research studies.

Independent lung ventilation

While this therapy is seldom used, information is available from the following sources:

- Hess DR, Kacmarek RM. *Essentials of Mechanical Ventilation*. New York, McGraw-Hill, 1996, 249-250.
- Ost D, Corbridge TC. Independent lung ventilation, *Clin Chest Med* 117:591-601, 1996.
- Independent Lung Ventilation, Siemens Videotape #90-80-98, 1986.

Curriculum implications: Information may be placed in a mechanical ventilation course. Place in a PBL case on unilateral lung disease.

Physician assisting: percutaneous needle biopsy, chest tube insertion, line insertion, conscious sedation

I discussed these issues with my medical director. While most of these procedures are likely to be performed by the physician without assistance, the therapist might assist by performing some of the following:

- Patient education as to the purpose of the procedure
- Proper positioning of the patient
- Setup of the equipment used for the procedure
- Disinfection of the site of the procedure
- Disposal of used equipment following the procedure
- Monitoring the patient following the procedure
- Labeling and transport of tissue or fluid samples to the laboratory
- Reporting adverse reactions to the physician

Curriculum implications: I recommend consulting with your medical director for specific needs in your clinical affiliates. Include students in working rounds with the local pulmonologists or others who consent to have student assistance.

Patient education and disease management

I was unable to find specific guidelines for age appropriateness in respiratory therapy textbooks. However, I know that JCAHO is interested in this area, and they may have resources available. I found asthma education

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"Curricular Implications" continued from page 4

materials from the American Lung Association that are targeted to children and adults. Those for children included comics and storybooks. Adult information is usually written at the late grade school level. Other considerations include:

- Visual impairment – use large text versions
- Educational/literary impairment – use lots of pictures
- Avoid jargon
- Make compliance fun/a game; this works well with kids

In addition, the following may be helpful in this area:

- Training the healthcare professional for the role of patient and caregiver educator, AARC CPG 45
- Providing patient and caregiver train-

ing, AARC CPG 46

- Guidelines for the Diagnosis and Management of Asthma, expert panel report 2. National Institutes of Health pub. 97-4051. Component 4: Education for a partnership in Asthma care: 123-137
- Practical Guide for the Diagnosis and Management of Asthma. NIH publication No. 97-4053, October 1997, (sent out with the September 1998 AARC Times)
- Captain America: Return of the Asthma Monster, Allen and Hanburys
- Childhood Asthma, A Matter of Control, ALA
- I'm a Meter Reader, by Sander. Allergy and Asthma Network/Mothers of Asthmatics, 3554 Chain Bridge Rd., Suite 220, Fairfax, VA 22030-2709, (800) 878-4403

Curriculum implications: Include this

material in a pediatrics course, in both classroom and clinical settings. See if students can work in an asthma clinic where children and adults are taught about asthma or smoking cessation.

Disease management

The same materials for protocols, clinical pathways, case management, an interdisciplinary patient care are applicable here.

Send in your own ideas

I hope this information is helpful to you. Perhaps this Bulletin can serve as a forum for educators who wish to submit their ideas on implementation of new matrix items. ■

Favorite Web Sites

by David W. Chang, EdD, RRT

For work: <http://www.healthy.net/library/search/medline.htm>

This web site searches medical and allied health journals by keywords, title, author, journal, year, ID, or a combination of these parameters. Once your parameters are found, it displays a listing of recent journals that contain them. You may then read the abstract of any article by clicking on the title. This web site is useful because it allows you to read the abstracts online. But you still need to go to the library if you want to look at the complete article. Because of its usefulness, it is one of

my favorite web sites for searching medical topics of my interest. (Final Grade: A)

For fun: <http://www.spinner.com>

This web site allows you to download a free program that enables you to play music via the sound board and speakers on your computer. It works like a jukebox, but the major advantages of Spinner are the choices (100+ channels) and number of songs (150,000) it offers. The 100+ channels provide a wide range of music categories to choose from, including tradi-

tional music (blues, big band, Christian, country, folk, jazz, rock etc.) and nontraditional music (8-trax, remember this monster tape? – boy crooners, El Nino, Fusion, Gumb etc.). Besides music and songs, it also offers musical scores, nature sound, operas, and laugh tracks. Spinner works best if you have a dedicated line for your Internet connection. So, if you like to listen to music while you are working on or near your computer, give it a try. You'll love it. (Final Grade: A) ■

Patient Assessment Course: Back By Popular Demand

Earn 16 hours of CRCE credit and learn how to:

- Function as a member of an interdisciplinary care team.
- Determine the patient's physical condition, assess the patient's needs, monitor and evaluate services and outcomes, and document services and activities.
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Live Videoconference: June 22, 11:30 AM - 1:00 PM CT
 - The Latest Word in the Treatment of COPD
Live Videoconference: August 24, 11:30 AM - 1:00 PM CT
 - PEEP: The State of the Art
Live Videoconference: September 28, 11:30 AM - 1:00 PM CT
 - New Developments in Respiratory Drugs,
Medications, and Delivery Devices
Live Videoconference: October 19, 11:30 AM - 1:00 PM CT
- For more information contact the AARC at 972/243-2272.*

Respiratory Care Education Annual: Call for Papers

The Education Section of the AARC will publish Volume 9 of the *Respiratory Care Education Annual* in the spring of 2000. The annual is a refereed journal committed to providing a forum for research and theory in respiratory care education and is listed in the *Cumulative Index to Nursing and Allied Health Literature*.

The section invites educators to submit papers for consideration. Preference will be given to papers that

emphasize original research, applied research, or evaluation of an educational method. Other topics that may be considered include interpretative reviews of literature, educational case studies, and point of view essays. Submissions will be reviewed based on originality, significance and contribution, soundness of scholarship (design, instrumentation, data analysis), generalizability to the education community, and overall quality of the paper.

Deadline for submission is December 1. Papers should be approximately six to ten pages in length and should follow the guidelines in the *Publication Manual of the American Psychological Association, 4th Edition*. Abstracts should not exceed 120 words. Submissions should be mailed to AARC Education Annual, 11030 Ables Lane, Dallas, TX 75229-4593. ■

Specialty Practitioner of the Year

Don't forget to make your nomination for the 1999 Education *Specialty Practitioner of the Year*. This honor is given to an outstanding practitioner from this section each year at the AARC's International Congress.

The recipient of this award will be determined by a selection committee

appointed by the chair. Each nominee must be a member of the AARC and a member of the Education Section.

Mail or FAX a short paragraph outlining why you think your nominee is deserving of this award, along with his/her name and contact information and your name and contact informa-

tion, to: Terry S. LeGrand, PhD, RRT, director of clinical education, department of respiratory care, The University of Texas Health Science Center at San Antonio, 7703 Floyd Curl Drive, San Antonio, TX 78284, FAX (210) 567-8852. ■

Review of CPGs

The AARC Clinical Practice Guidelines Steering Committee would like your help in revising the Clinical Practice Guidelines (CPGs). We need the respiratory community to identify specific areas of the CPGs for revision. Note that the CPGs are evidence based; therefore, please identify areas for revision, provide suggestions for revision, and cite peer-reviewed literature to support those suggestions.

Please e-mail your specific comments to the chair of the Steering Committee, Dean Hess, PhD, RRT, FAARC, at dhess@partners.org or fax them to 617/724-4495.

You will find copies of all the CPGs published by the AARC at: http://www.rcjournal.com/online_resources/cpgs/cpg_index.html