Interim policy announced for post-primary structured education requirement

*Interim policy ‘relaxes’ exam content outline requirement*

(November 12, 2015) — The ARRT announces an interim policy that modifies the post-primary certification and registration structured education requirement effective January 1, 2016.

In 2010, ARRT announced an additional requirement for individuals seeking post-primary credentials. Sixteen hours of structured education reflecting the content of the examination content outline with at least one credit from each major content category of the outline would be required beginning this January 1, 2016.

The structured education requirement will enhance post-primary certification and registration by providing additional documentation that candidates have mastered the knowledge determined through the practice analysis process to be part of being qualified.

“Relaxed” interim requirement takes effect

In November 2015, ARRT announced a two-year interim phase-in period for the requirement. During the phase-in candidates must report 16 structured education credits from activities whose content “pertains to the discipline” rather than the stricter criterion of “reflecting the content of the examination content outline.” The provision that candidates earn at least one credit from each of the exam content outline’s major categories will not be enforced during the 2-year period. The activities must still meet the same criteria as activities reported for compliance with ARRT’s biennial CE requirements (i.e., must be approved by a RCEEM, RCEEM+ or must meet ARRT’s definition of an Approved Academic Course as described in the ARRT Continuing Education Requirements).

Interim policy effective January 1, 2016, through December 31, 2017

The two-year interim policy will allow CE sponsors additional time to create more activity options and better align existing activities with the subject matter of the post-primary exam content outlines. This will increase access for candidates to the education necessary to comply with the requirement.

The interim policy will apply to activities completed prior to January 1, 2018.

Activities completed January 1, 2018 and thereafter must meet the full structured education requirement as originally announced.
Sonography

The purpose of structured education is to provide the opportunity for individuals to develop mastery of discipline-specific knowledge that, when coupled with selected clinical experiences, helps to document qualifications. The *Structured Education Requirements for Sonography* is provided to assist candidates with these requirements.

Candidates for sonography certification and registration must document at least 16 hours of structured education. The activities must be earned within the 24-month period immediately prior to submission of an application for certification and registration. Structured education activities may be academic courses from an institution accredited by a mechanism recognized by the ARRT, CE opportunities approved by a RCEEM or RCEEM+, or a combination of the two.

Structured education documentation must include at least one CE credit or its equivalent in each content category listed below (i.e., Patient Care, Safety, Image Production, and Procedures). The remaining hours may be earned from any one or more of the content areas. Specific topics within each category are addressed in the content outline, which makes up the remaining pages of this document.

### Content Category

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<th>Content Category</th>
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<tr>
<td><strong>Total</strong></td>
<td><strong>16</strong></td>
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### Acceptable Examples:

<table>
<thead>
<tr>
<th>Example 1</th>
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<tr>
<td>Patient Care – 3 hours</td>
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<td>Patient Care – 1 hour</td>
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<td>Image Production – 6 hours</td>
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<td>Procedures – 14 hours</td>
<td>Procedures – 5 hours</td>
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<tr>
<td><strong>TOTAL – 16 hours</strong></td>
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</tr>
</tbody>
</table>

1. If there is a structured education requirement document with a newer effective date, you may either use the new document or continue to use this document if you have completed at least one educational activity prior to the effective date of the new version. For more information access the online clinical experience tool, where structured education is also reported.

2. Activities meeting the definition of an approved academic course will be awarded credit at the rate of 12 CE credits for each academic quarter credit or 16 CE credits for each academic semester credit. See the ARRT *Continuing Education Requirements* document for additional information.
Patient Care

1. Patient Interactions and Management

   A. Confirmation of Exam Requisition
      1. verification of patient identification
      2. comparison of request to clinical indications
      3. verification of exam coding
   
   B. Legal Issues
      1. common terminology
         (*e.g., negligence, malpractice*)
      2. legal doctrines (e.g., respondeat superior, res ipsa loquitur)
   
   C. Patient’s Rights
      1. informed consent (written, oral, implied)
      2. confidentiality (HIPAA)
      3. Patient’s Bill of Rights
         (e.g., privacy, access to information, health care proxy, research participation)
   
   D. ARRT Standards of Ethics

   E. Interpersonal Communications
      1. modes of communication
         a. verbal, written
         b. nonverbal
            (e.g., eye contact, touching)
      2. challenges in communication
         a. patient characteristics
            (e.g., cultural factors, physical or emotional status)
         b. strategies to improve understanding
      3. patient education
         a. pre-procedural preparation
         b. explanation of procedure
            (e.g., risks, benefits)
         c. follow-up instructions
         d. referral to other services
      4. medical terminology

   F. Patient Monitoring and Safety
      1. ultrasound bioeffects and safety
         a. pressure and intensity measurement
            1. thermal index (soft tissue, cranium, bone)
            2. mechanical index
         b. research on biological effects
         c. AIUM recommendations
      2. routine monitoring
         a. fall prevention
         b. vital signs
         c. physical signs and symptoms
      3. interventional procedures
         a. patient preparation
         b. time-out
         c. informed consent
         d. sterile technique
         e. follow-up instructions
      4. patient transfer and movement
         a. operator ergonomics
         b. body mechanics (balance, alignment, movement)
         c. patient transfer
      5. assisting patients with medical equipment
         a. infusion catheters and pumps
         b. pacemakers
         c. oxygen delivery systems
         d. other (e.g., nasogastric tubes, urinary catheters)
      6. response to common emergencies
         a. allergic reactions
            (e.g., contrast, latex)
         b. cardiac/respiratory arrest
            (e.g., CPR)
         c. physical injury or trauma
         d. other medical disorders
            (e.g., seizures, diabetic reactions)

* The abbreviation “e.g.,” is used to indicate that examples are listed in parentheses, but that it is not a complete list of all possibilities.

(Patient Care continues on the following page.)
Patient Care (continued)

G. Infection Control
   1. terminology and basic concepts
      a. types of asepsis
      b. sterile technique
      c. pathogens
         (e.g., fomites, vehicles, vectors)
      d. nosocomial infections
   2. cycle of infection
      a. pathogen
      b. source or reservoir of infection
      c. susceptible host
      d. method of transmission (contact, droplet, airborne, common vehicle, vector-borne)
   3. CDC Standard Precautions (general patient contact)
      a. handwashing
      b. gloves, gowns
      c. masks
      d. medical asepsis/disinfection
   4. additional or transmission-based precautions (e.g., hepatitis B, HIV, MRSA, tuberculosis)
      a. blood borne
      b. airborne (e.g., negative ventilation)
      c. droplet (e.g., mask)
      d. contact (e.g., gloves, gown)
   5. reverse isolation
   6. disposal of contaminated materials
      a. linens
      b. needles
      c. patient supplies
      d. blood and body fluids
   7. equipment
      a. sterilization
      b. disinfection
Image Production

1. Basic Principles of Ultrasound and Equipment
   A. Generation of Signal
      1. transducers
         a. construction and properties
            1. crystal thickness, wavelength
            2. frequency spectrum, resonance
            3. damping
         b. operation
            1. focusing
            2. beam diameter
            3. piezoelectric effect
         c. types
      2. beam configuration
         a. near and far field
         b. focal zone
         c. beam profile
      3. pulse characteristics
         a. pulse repetition frequency
         b. pulse repetition period
         c. spatial pulse length
         d. duty factor
         e. frequency
         f. resolution
            1. axial
            2. lateral
            3. temporal
            4. elevational
            5. contrast
         g. transducer malfunctions
      4. technical factors
         a. frequency, bandwidth, Q factor
         b. power
         c. pressure
         d. intensity
         e. amplitude
      5. modes
         a. B-mode
         b. M-mode
         c. Doppler
            1. color
            2. spectral
            3. power/energy
   B. Image Formation
      A. Tissue Interactions
         1. beam interactions
            a. speed of sound in soft tissue
               1. density
               2. stiffness
            b. time and distance - range equation
            c. acoustic impedance
            d. normal and oblique incidence
            e. reflection
            f. transmitted/refracted waves
            g. intensity
            h. causes of artifacts
      2. attenuation of signal
         a. frequency dependence
         b. absorption
         c. scattering
      3. bioeffects
         a. thermal
         b. mechanical (e.g., cavitation)
      c. output measures
         (e.g., MI, TIS, TIC, TIB, SPTA)
      d. ALARA
      B. Technical Factors for Diagnostic Quality Images
         1. power
         2. focal zone
         3. depth
         4. gain
         5. compensation
         6. harmonics
         7. spatial compounding
      C. Detection and Display of Echoes
         1. transducer
         2. receiver
         3. amplitude
         4. dynamic range and compression
         5. analog-to-digital converter (ADC)
         6. digital-to-analog converter (DAC)
         7. brightness
         8. contrast
         9. write magnification
         10. post-processing
            (e.g., smoothing, edge enhancement, filtering, read magnification)
         11. emerging technologies
            (e.g., 3D imaging, panoramic imaging)

(Image Production continues on the following page.)
Image Production (continued)

3. Evaluation and Selection of Representative Images

A. Display Modes
   1. real-time imaging
      a. echogenicity of reflectors
      b. echotextures
      c. artifacts
   2. Doppler
      a. angle of incidence
      b. flow direction
      c. flow velocity
      d. spectral display (e.g., RI, PI, scale, wall filter)
      e. hemodynamics

B. Appearance and Causes of Artifacts
   1. gray scale (e.g., reverberation mirror imaging, shadowing, posterior enhancement, comet tail)
   2. Doppler (e.g., aliasing, twinkle, mirror image)

C. Improvement of Suboptimal Images

D. Image Archiving
Procedures

TYPE OF EXAM

1. Abdominal and Transplant Vasculature
   A. Aorta and Branches
   B. Inferior Vena Cava (IVC) and Confluences
   C. Portal Veins and Confluences
   D. Transplants (i.e., kidney, liver)
   E. Abdominal Organs
      1. biliary system
         a. gallbladder
         b. bile ducts
            (e.g., CBD, extra-hepatic)
      2. urinary tract
         a. kidneys
         b. ureters
         c. bladder
      3. spleen
      4. pancreas
      5. liver
      6. other
         a. lymph nodes
         b. adrenal glands
         c. gastrointestinal tract
         d. prostate
         e. peritoneal cavity

FOCUS OF QUESTIONS

1. Practice Guidelines (e.g., AIUM, ACR)
   • clinical indications
   • patient preparation
   • patient positioning
   • instrumentation (e.g., transducer, stand-off pads)
   • technical factors
   • evaluation and documentation of visualized anatomy
   • optimizing image quality

2. Anatomy and Physiology
   • normal
   • normal variant
   • abnormal
   • measurements

3. Abnormalities
   • pathology
   • congenital anomalies
   • lab values
   • differential diagnosis

4. Doppler Applications/Blood Flow Characteristics

(Procedures continue on the following page.)
### Procedures (continued)

#### TYPE OF EXAM

**2. First Trimester Obstetrics**

- A. Standard Measurements  
  (e.g., heart rate, CRL, MSD)
- B. Maternal Anatomy  
  (e.g., uterus, cervix, adnexa, corpus luteum)
- C. Embryonic Anatomy and Physiology  
  1. fetal number  
  2. gestational age  
  3. gestational sac  
  4. decidual layer  
  5. amnion  
  6. chorion  
  7. yolk sac  
  8. embryonic pole  
  9. cardiac activity  
  10. nuchal translucency
- D. Key Abnormalities  
  (e.g., anembryonic pregnancy, spontaneous abortion, ectopic pregnancy, embryonic demise)

**3. Second/Third Trimester and High Risk Obstetrics**

- A. Standard Measurements  
  (e.g., BPD, HC, AC, FL)
- B. Maternal Anatomy  
  (e.g., uterus, cervix, adnexa)
- C. Fetal Anatomy and Physiology  
  1. fetal number  
  2. position, presentation, and lie  
  3. gestational age and weight  
  4. amniotic fluid volume  
  5. cord  
  6. placenta  
  7. cardiac activity  
  8. anatomic systems visualized  
  (e.g., GI, CNS, cardiovascular)  
  9. nuchal fold
- D. Chromosomal Abnormalities  
  (e.g., trisomies, triploidy)
- E. Genetic Abnormalities  
  (e.g., polycystic kidney disease, skeletal dysplasia)
- F. Infection  
  (e.g., TORCH)

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(Procedures continue on the following page.)
Procedures (continued)

**TYPE OF EXAM**

G. Abnormal Growth and Development (e.g., club foot, atresia, anencephaly, renal agenesis, gastroschisis, VSD)

H. Neoplasm (e.g., teratoma)

I. Multiple Gestations (e.g., chorionicity, amnionicity, twin-to-twin transfusion syndrome, conjoined)

J. Assisted Reproduction/Implantation

K. Amniocentesis

L. Fetal Biophysical Profile

M. Placenta (e.g., trophoblastic disease, previa, accreta, insufficiency, abruption, hematoma)

N. Amniotic Fluid (e.g., polyhydramnios, oligohydramnios, PROM)

O. Hydrops (immune & non-immune)

P. Intrauterine Growth Restriction (symmetric and asymmetric)

Q. Umbilical Cord (e.g., 2-vessel cord, knots, vasa previa, prolapse)

R. Cervical Incompetence

S. Maternal Disease and Abnormality (e.g., diabetes, uterine anomaly)

4. Gynecologic Structures

A. Uterus
   1. myometrium
   2. endometrium
   3. cervix

B. Adnexa
   1. ovaries
   2. fallopian tubes
   3. para-ovarian structures

C. Cul-de-Sac

D. Vagina

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4. Doppler Applications/Blood Flow Characteristics

(Procedures continue on the following page.)
Procedures (continued)

**TYPE OF EXAM**

5. **Superficial Structures and Other Sonographic Procedures**
   A. Neck, Thyroid, and Parathyroid
   B. Scrotum and Testes
   C. Breasts
   D. Other Sonographic Procedures
      1. vascular exams
         a. venous extremity Doppler (lower and upper)
         b. carotid Doppler
         c. post catheterization complications
      2. pediatric exams
         a. neonatal (head, spine, hips)
         b. gastrointestinal tract (e.g., appendix, pylorus, intussusceptions)
         c. adrenal/renal
      3. ultrasound guided interventional procedures (e.g., fine needle aspiration, biopsy, catheter placement)
      4. miscellaneous
         a. musculoskeletal
         b. superficial masses
         c. noncardiac chest (e.g., pleural space)
         d. abdominal wall

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