Radiography

The purpose of the examination requirement is to assess whether individuals have obtained the knowledge and cognitive skills underlying the intelligent performance of the tasks typically required in radiography for practice at entry level.

ARRT determined the tasks that entry-level radiographers typically perform by administering a comprehensive practice analysis survey to a nationwide sample of radiographers.[1] The *Task Inventory for Radiography* is on ARRT's website (www.arrt.org).

The *Examination Content Specifications for Radiography* and attached content outline identify the knowledge areas underlying performance of the tasks on the *Task Inventory for Radiography*. Every content category links to one or more tasks on the task inventory.

ARRT avoids content when there are multiple resources with conflicting perspectives. Educational programs accredited by a mechanism acceptable to ARRT offer education and experience beyond the minimum requirements specified in the content specifications and clinical requirements documents.

This document is not intended to serve as a curriculum guide. Although ARRT programs for certification and registration and educational programs may have related purposes, their functions are clearly different. Educational programs are generally broader in scope and address the subject matter that is included in the content outline, but do not limit themselves to only this content. ARRT administers this examination on a computer at a standardized testing center.

The table below presents the major content categories and subcategories that the examination covers. The table lists the number of test questions in each category in bold and the number of test questions in each subcategory in parentheses. The content outline, which makes up the remaining pages of this document, addresses specific topics within each category.

Content Category	Number of Scored Questions[2]
Patient Care	**31**
Patient Interactions and Management (31)	
Safety	**46**
Radiation Physics and Radiobiology[3] (21)	
Radiation Protection (25)	
Image Production	**51**
Image Acquisition and Evaluation (26)	
Equipment Operation and Quality Assurance (25)	
Procedures	**72**
Head, Spine, and Pelvis Procedures (20)	
Thorax and Abdomen Procedures (22)	
Extremity Procedures (30)	
Total	**200**

[1] A special debt of gratitude is due to the hundreds of professionals participating in this project as committee members, survey respondents, and reviewers.
[2] The exam includes an additional 30 unscored (pilot) questions.
[3] SI units are the primary (principle) units of radiation measurement used on the radiography examination.

Patient Care

1. Patient Interactions and Management

A. Ethical and Legal Aspects
   1. patients' rights
      a. consent (e.g.,* informed, oral, implied)
      b. confidentiality (HIPAA)
      c. American Hospital Association (AHA) Patient Care Partnership
         1. privacy
         2. extent of care (e.g., DNR)
         3. access to information
         4. living will, health care proxy, advanced directives
         5. research participation
   2. legal issues
      a. verification (e.g., patient identification, comparison of order to clinical indication, exam coding)
      b. common terminology (e.g., battery, negligence, malpractice, beneficence)
      c. legal doctrines (e.g., respondeat superior, res ipsa loquitur)
      d. restraints versus positioning aids used to eliminate motion artifact
      e. manipulation of electronic data (e.g., exposure indicator, processing algorithm, brightness and contrast, cropping or masking off anatomy)
      f. documentation (e.g., changes to order, medical event)
   3. ARRT Standards of Ethics

B. Interpersonal Communication
   1. modes of communication
      a. verbal or written
      b. nonverbal (e.g., eye contact, touching)
   2. challenges in communication
      a. interactions with others
         1. language barriers
         2. cultural and social factors
         3. physical, sensory, or cognitive impairments
         4. age
         5. emotional status, acceptance of condition (e.g., mental health state)
      b. explanation of medical terms
      c. strategies to improve understanding
   3. patient education
      a. explanation of current procedure (e.g., purpose, length of time, radiation dose)
      b. patient scheduling (e.g., length of procedure, patient's condition, age, preparation for the procedure)
      c. pre- and post-examination instructions (e.g., need for medical interpreter, preparation, diet, medications, discharge instructions)
      d. respond to inquiries about other imaging modalities (e.g., differences, types of radiation, patient preps)

C. Physical Assistance and Monitoring
   1. body ergonomics (e.g., balance, alignment, movement)
      a. patient transfer techniques
      b. safe patient handling devices (e.g., transfer board, Hoyer lift, gait belt)
   2. assisting patients with medical equipment
      a. infusion catheters and pumps
      b. oxygen delivery systems
      c. other (e.g., nasogastric tubes, urinary catheters, tracheostomy tubes)
   3. patient monitoring and documentation
      a. vital signs (e.g., blood pressure, pulse, respiration rate)
      b. physical signs and symptoms (e.g., motor control, severity of injury)
      c. fall prevention
      d. patient comfort and modesty

D. Medical Emergencies
   1. non-contrast allergic reactions (e.g., latex)
   2. cardiac or respiratory arrest (e.g., CPR, AED)
   3. physical injury or trauma
   4. other medical disorders (e.g., seizures, diabetic reactions)
   5. communication of critical findings to health care team

*"e.g." indicates examples of the topics covered but is not a complete list.

Patient Care (continued)

E. Infection Control
   1. chain of infection (cycle of infection)
      a. pathogen
      b. reservoir
      c. portal of exit
      d. mode of transmission
         1. direct
            a. droplet
            b. direct contact
         2. indirect
            a. airborne
            b. vehicle-borne (fomite)
            c. vector-borne (mechanical or biological)
      e. portal of entry
      f. susceptible host
   2. asepsis
      a. equipment disinfection
      b. equipment sterilization
      c. medical aseptic technique
      d. sterile technique
   3. CDC Standard Precautions
      a. hand hygiene
      b. use of personal protective equipment (PPE) (e.g., gloves, gowns, masks)
      c. safe handling of contaminated equipment and surfaces
      d. disposal of contaminated materials
         1. linens
         2. needles
         3. patient supplies
         4. blood and body fluids
         5. IV supplies (e.g., tubing, bags)
      e. safe injection practices
   4. transmission-based precautions
      a. contact
      b. droplet
      c. airborne
   5. additional precautions
      a. neutropenic precautions (reverse isolation)
      b. healthcare-associated (nosocomial) infections

F. Handling and Disposal of Toxic or Hazardous Material
   1. types of materials
      a. chemicals
      b. chemotherapy
      c. disinfectants
   2. safety data sheet

G. Pharmacology
   1. patient history
      a. medication reconciliation (current medications)
      b. premedications
      c. contraindications (e.g., allergies)
      d. scheduling and sequencing examinations
   2. administration
      a. routes (e.g., IV, oral)
      b. supplies (e.g., enema kits, needles)
      c. procedural technique (e.g., venipuncture)
      d. contrast media dose calculation
   3. contrast media types and properties (e.g., iodinated, water soluble, barium, ionic versus non-ionic)
   4. appropriateness of contrast media to examination
      a. patient condition (e.g., perforated bowel)
      b. patient age and weight
      c. laboratory values (e.g., BUN, creatinine, eGFR)
   5. complications and reactions
      a. local effects (e.g., extravasation, infiltration, phlebitis)
      b. systemic effects
         1. mild
         2. moderate
         3. severe
      c. emergency medications
      d. radiographer's response and documentation

Safety

1. Radiation Physics and Radiobiology

A. Principles of Radiation Physics
   1. X-ray production
      a. source of free electrons (e.g., thermionic emission)
      b. acceleration of electrons
      c. focusing of electrons
      d. deceleration of electrons
   2. target interactions
      a. bremsstrahlung
      b. characteristic
   3. X-ray beam
      a. frequency and wavelength
      b. beam characteristics
         1. quality
         2. quantity
         3. primary versus remnant (exit)
      c. inverse square law
      d. fundamental properties (e.g., travel in straight lines, ionize matter)
   4. photon interactions with matter
      a. photoelectric
      b. Compton
      c. coherent (classical)
      d. attenuation by various tissues
         1. thickness of body part
         2. type of tissue (atomic number)

B. Biological Effects of Radiation
   1. SI units of measurement (NCRP #184)
      a. absorbed dose (Gy)
      b. dose equivalent (Sv)
      c. exposure (C/kg)
      d. effective dose (Sv)
      e. air kerma (Gy)
   2. radiosensitivity
      a. dose-response relationships (e.g., LET, RBE)
      b. relative tissue radiosensitivities
      c. cell survival and recovery (LD_{50})
      d. oxygen effect
   3. somatic effects
      a. cells
      b. tissue (e.g., eye, thyroid, breast, skin, marrow, gonad)
      c. embryo and fetus
      d. carcinogenesis
      e. early versus late or acute versus chronic
      f. deterministic (tissue reactions) versus stochastic
      g. short-term versus long-term exposure
      h. acute radiation syndromes
         1. hemopoietic
         2. gastrointestinal (GI)
         3. central nervous system (CNS)

Safety (continued)

2. Radiation Protection

A. Minimizing Patient Exposure and Repeats
   1. exposure factors
      a. kVp
      b. mAs
      c. automatic exposure control (AEC)
   2. beam restriction
      a. purpose of primary beam restriction
      b. types (e.g., collimators)
   3. patient considerations
      a. positioning
      b. communication
      c. pediatric
      d. body habitus
      e. pregnancy
   4. filtration
      a. effect on skin and organ exposure
      b. effect on average beam energy
      c. NCRP recommendations (NCRP #102, minimum filtration in useful beam)
   5. radiographic dose documentation
   6. digital detector (e.g., DQE, exposure latitude)
   7. grids
   8. fluoroscopy
      a. pulsed
      b. exposure factors
      c. grids
      d. positioning
         1. patient positioning
         2. vary beam angulation
      e. fluoroscopy time
      f. automatic brightness control (ABC) or automatic exposure rate control (AERC)
      g. receptor positioning
      h. magnification mode
      i. last image hold
      j. minimum source-to-skin distance (21 CFR)
      k. dose monitoring equipment
         1. cumulative air kerma
         2. dose rate display
         3. time documentation
   9. dose area product (DAP) meter
   10. resources (e.g., Image Wisely®, Image Gently®)

B. Personnel Protection (ALARA)*
   1. sources of radiation exposure
      a. primary X-ray beam
      b. secondary radiation
         1. scatter
         2. leakage
      c. patient as source
   2. basic methods of protection
      a. time
      b. distance
      c. shielding (e.g., need and appropriate use)
   3. protective devices
      a. types (e.g., aprons, barriers)
      b. attenuation properties
      c. minimum lead equivalent (e.g., apron, accessories) (NCRP #102)
   4. special considerations
      a. mobile units
      b. fluoroscopy
         1. protective drapes
         2. protective Bucky slot cover
         3. cumulative timer
         4. remote-controlled fluoroscopy
      c. guidelines for fluoroscopy and mobile units (NCRP #102, 21 CFR)
         1. fluoroscopy exposure rates (normal and high-level control)
         2. exposure switch guidelines
   5. radiation exposure and monitoring
      a. dosimeters
         1. types (e.g., TLD, OSL, DIS)
         2. proper use
      b. recommendations and regulations for personnel monitoring (NCRP #180, 21 CFR)
         1. occupational exposure
         2. public exposure
         3. embryo and fetus exposure
         4. dose equivalent limits
         5. evaluation and maintenance of personnel dosimetry records
   6. handling and disposal of radioactive material

*(August 24, 2016) Note: Although it is the radiographer's responsibility to apply radiation protection principles to minimize bioeffects for both patients and personnel, the ALARA concept is specific to personnel protection and is listed only for that section.

Image Production

1. Image Acquisition and Evaluation

A. Factors Affecting Radiographic Quality
(X indicates topics covered on the examination.)

	1. Receptor Exposure	2. Image Contrast	3. Subject Contrast	4. Spatial Resolution	5. Distortion
a. mAs	X				
b. kVp	X	X	X		
c. OID		X		X	X
d. SID	X			X	X
e. focal spot size				X	
f. grids*	X	X			
g. tube filtration	X	X	X		
h. beam restriction	X	X			
i. motion				X	
j. anode heel effect	X				
k. patient factors (size, pathology)	X	X	X		X
l. angle (tube, part, or receptor)	X			X	X

* Includes conversion factors for grids

B. Technique Charts
   1. anatomically programmed technique
   2. fixed versus variable kVp
   3. special considerations
      a. casts
      b. pathologic factors
      c. age (e.g., pediatric, geriatric)
      d. body mass index (BMI)
      e. contrast media
      f. grids
      g. OID

C. Automatic Exposure Control (AEC)
   1. effects of changing exposure factors on radiographic quality
   2. detector selection
   3. anatomic alignment
   4. exposure adjustment (e.g., density, +1 or −1)

D. Digital Imaging Characteristics
   1. spatial resolution
      a. pixel characteristics (e.g., size, pitch)
      b. detector element (DEL) (e.g., size, pitch, fill factor) CCD, CMOS (e.g., size, pitch)
      c. Nyquist frequency
      d. matrix size
      e. modulation transfer function (MTF)
   2. contrast resolution
      a. bit depth
      b. detective quantum efficiency (DQE)
      c. grids (e.g., focused, virtual)
   3. image signal
      a. dynamic range
      b. quantum noise (quantum mottle)
      c. signal-to-noise ratio (SNR)

E. Image Identification
   1. methods (e.g., radiographic, electronic)
   2. legal considerations (e.g., patient data, examination data)

F. Criteria for Image Evaluation
   1. exposure indicator
   2. quantum noise (quantum mottle)
   3. gross exposure error (e.g., loss of contrast, saturation)
   4. contrast (e.g., subject, image)
   5. spatial resolution
   6. distortion (e.g., size, shape)
   7. identification markers (e.g., anatomical side, patient, date)
   8. image artifacts

Image Production (continued)

2. Equipment Operation and Quality Assurance

A. Imaging Equipment
   1. X-ray generator, transformers, and rectification system
      a. basic principles
      b. phase, pulse, and frequency
      c. tube loading
   2. components of radiographic unit (fixed or mobile)
      a. operating console
      b. X-ray tube construction
         1. electron source
         2. target materials
         3. induction motor
         4. filtration
      c. automatic exposure control (AEC)
         1. radiation detectors
         2. back-up timer
         3. exposure adjustment (e.g., density, +1 or -1)
         4. minimum response time
      d. manual exposure controls
      e. digital detector
         1. direct conversion (e.g., a-Se)
         2. indirect conversion (e.g., a-SI, CCD)
      f. beam restriction
   3. components of fluoroscopic unit (fixed or mobile)
      a. image receptors
         1. image intensifier
         2. flat panel
      b. viewing systems
      c. recording systems
      d. automatic brightness control (ABC) or automatic exposure rate control (AERC)
      e. magnification mode
      f. table
   4. accessories
      a. stationary grids
      b. virtual grids
      c. Bucky assembly

B. Image Processing and Display
   1. raw data (preprocessing)
      a. analog-to-digital converter (ADC)
      b. quantization
      c. corrections (e.g., rescaling, flat fielding, dead pixel correction)
      d. histogram
   2. corrected data for processing
      a. grayscale
      b. edge enhancement
      c. equalization
      d. smoothing
   3. data for display
      a. values of interest (VOI)
      b. look-up table (LUT)
   4. postprocessing
      a. brightness (e.g., window level)
      b. contrast (e.g., window width)
      c. region of interest (ROI)
      d. electronic cropping or masking
      e. stitching
   5. display monitors
      a. viewing conditions (e.g., viewing angle, ambient lighting)
      b. spatial resolution (e.g., pixel size, pixel pitch)
      c. brightness and contrast resolution
   6. informatics
      a. information systems (e.g., HIS, RIS, EMR, EHR)
      b. networking
         1. PACS/MIMPS
         2. DICOM
         3. security and confidentiality
         4. teleradiology (e.g., third party coverage)
      c. downtime procedures

C. Quality Control of Imaging Equipment and Accessories
   1. beam restriction
      a. light field to radiation field alignment
      b. central ray alignment
   2. recognition and reporting of malfunctions
   3. digital imaging receptor systems
      a. maintenance (e.g., detector calibration, plate calibration)
      b. QC tests (e.g., plate uniformity, spatial resolution)
      c. display monitor quality assurance (e.g., grayscale standard display function, luminance)
   4. shielding accessories (e.g., testing lead apron, gloves)

Procedures

This section addresses imaging procedures for the anatomic regions listed below. Questions will cover the following topics:

1. Positioning (e.g., topographic landmarks, planes, anatomical alignment, body positions, path of central ray, positioning aids, respiration).
2. Anatomy (e.g., including physiology, basic pathology, related medical terminology).
3. Procedure adaptation (e.g., body habitus, body mass index, trauma, pathology, age, limited mobility).
4. Evaluation of displayed anatomical structures (e.g., patient positioning, tube-part-image receptor alignment).

1. Head, Spine, and Pelvis Procedures

A. Head
   1. skull
   2. facial bones
   3. mandible
   4. temporomandibular joints
   5. nasal bones
   6. orbits
   7. paranasal sinuses

B. Spine and Pelvis
   1. cervical spine
   2. thoracic spine
   3. scoliosis series
   4. lumbar spine
   5. sacrum and coccyx
   6. myelography, lumbar puncture, epidural injections
   7. sacroiliac joints
   8. pelvis and hip

2. Thorax and Abdomen Procedures

A. Thorax
   1. chest
   2. ribs
   3. sternum
   4. soft tissue neck
   5. foreign body, airway or ingested
   6. clavicle
   7. sternoclavicular joints
   8. line placement with C-arm (e.g., PICC)

B. Abdomen and GI Studies
   1. abdomen
   2. esophagram
   3. swallowing dysfunction study
   4. upper GI series, single or double contrast
   5. small bowel series
   6. contrast enema, single or double contrast
   7. surgical cholangiography
   8. ERCP
   9. foreign body, ingested
   10. nasogastric/enteric and orogastric/enteric tube placement (e.g., Dobbhoff; bedside, C-arm, fluoroscopy)

C. GU Studies
   1. cystography
   2. cystourethrography
   3. retrograde urography
   4. hysterosalpingography

3. Extremity Procedures

A. Upper Extremities
   1. fingers
   2. hand
   3. wrist
   4. forearm
   5. elbow
   6. humerus
   7. shoulder
   8. scapula
   9. acromioclavicular joints
   10. bone age

B. Lower Extremities
   1. toes
   2. foot
   3. calcaneus
   4. ankle
   5. tibia/fibula
   6. knee/patella
   7. femur
   8. long bone measurement

C. Other
   1. bone survey (e.g., metastatic, non-accidental trauma)
   2. arthrography, joint injection, aspiration

Attachment A

Radiographic Positions and Projections

1. Head, Spine, and Pelvis

A. Head

1. Skull
   a. AP axial (Towne)
   b. lateral
   c. PA axial (Caldwell)
   d. PA
   e. submentovertex (full basal)
   f. trauma cross-table (horizontal beam) lateral
   g. trauma AP
2. Facial Bones
   a. lateral
   b. parietoacanthial (Waters)
   c. PA axial (Caldwell)
   d. modified parietoacanthial (modified Waters)
3. Mandible
   a. axiolateral oblique
   b. PA
   c. AP axial (Towne)
   d. PA axial
4. Temporomandibular Joints
   a. axiolateral oblique (modified Law)
   b. AP axial (modified Towne)
5. Nasal Bones
   a. parietoacanthial (Waters)
   b. lateral
   c. PA axial (Caldwell)
6. Orbits
   a. parietoacanthial (Waters)
   b. lateral
   c. PA axial
   d. modified parietoacanthial (modified Waters)
7. Paranasal Sinuses
   a. lateral, horizontal beam
   b. PA axial (Caldwell), horizontal beam
   c. parietoacanthial (Waters), horizontal beam

B. Spine and Pelvis

1. Cervical Spine
   a. AP axial
   b. AP open mouth
   c. lateral
   d. cross-table (horizontal beam) lateral
   e. PA axial obliques
   f. AP axial obliques
   g. lateral swimmers
   h. lateral flexion and extension
   i. AP dens (Fuchs)
2. Thoracic Spine
   a. AP
   b. lateral, breathing
   c. lateral, expiration
3. AP or PA thoracolumbar
4. Scoliosis Series
   a. AP or PA
   b. lateral
5. Lumbar Spine
   a. AP
   b. PA
   c. lateral
   d. L5-S1 lateral spot
   e. posterior oblique (RPO/LPO)
   f. anterior oblique (RAO/LAO)
   g. AP axial L5-S1
   h. lateral flexion and extension
6. Sacrum and Coccyx
   a. AP axial sacrum
   b. AP axial coccyx
   c. lateral sacrum and coccyx, combined
7. Sacroiliac Joints
   a. AP axial
   b. posterior oblique
   c. anterior oblique
8. Pelvis and Hip
   a. AP hip only
   b. cross-table (horizontal beam) lateral hip (Danelius-Miller)
   c. unilateral frog-leg, non-trauma
   d. axiolateral inferosuperior, trauma (Clements-Nakayama)
   e. AP pelvis
   f. AP pelvis, bilateral frog-leg
   g. AP pelvis, axial anterior pelvic bones (inlet, outlet)
   h. posterior oblique pelvis, acetabulum (Judet)
   h. AP pelvis weightbearing

2. Thorax and Abdomen

A. Thorax

1. Chest
   a. PA or AP upright
   b. lateral upright
   c. AP lordotic
   d. AP supine
   e. lateral decubitus
2. Ribs
   a. AP and PA, above and below diaphragm
   b. anterior and posterior obliques
3. Sternum
   a. lateral
   b. RAO
4. Soft Tissue Neck
   a. AP upper airway
   b. lateral upper airway
5. Sternoclavicular Joints
   a. PA
   b. LAO and RAO
6. Clavicle
   a. AP or PA
   b. AP or PA axial

B. Abdomen and GI Studies

1. Abdomen
   a. AP supine
   b. AP upright
   c. lateral decubitus
   d. dorsal decubitus
2. Esophagus
   a. RAO
   b. left lateral
   c. AP
   d. PA
   e. LAO
3. Swallowing Dysfunction Study
4. Upper GI Series*
   a. AP or PA scout
   b. RAO
   c. PA
   d. right lateral
   e. LPO
   f. AP
5. Small Bowel Series
   a. PA scout
   b. PA (follow through)
   c. ileocecal spots
6. Contrast Enema*
   a. left lateral rectum
   b. left lateral decubitus
   c. right lateral decubitus
   d. LPO and RPO
   e. PA
   f. RAO and LAO
   g. AP axial (sigmoid)
   h. PA axial (sigmoid)
   i. PA or AP post-evacuation

C. GU Studies

1. Cystography
   a. AP (including scout)
2. Cystourethrography
   a. AP voiding cystourethrogram female
   b. RPO voiding cystourethrogram male
3. Retrograde Urography
   a. AP scout
   b. AP pyelogram
   c. AP ureterogram

*single or double contrast

3. Extremities

A. Upper Extremities

1. Fingers
   a. PA entire hand
   b. PA finger only
   c. lateral
   d. medial and/or lateral oblique
   e. AP thumb
   f. medial oblique thumb
   g. lateral thumb
2. Hand
   a. PA
   b. lateral
   c. lateral oblique
   d. Norgaard (ball catchers view)
3. Wrist
   a. PA
   b. lateral oblique
   c. lateral
   d. PA – ulnar deviation
   e. PA axial (Stecher)
   f. tangential carpal canal (Gaynor-Hart)
4. Bone Age
5. Forearm
   a. AP
   b. lateral
6. Elbow
   a. AP
   b. lateral
   c. lateral oblique
   d. medial oblique
   e. AP partial flexion
   f. trauma axial laterals (Coyle)
7. Humerus
   a. AP
   b. lateral
   c. neutral
   d. transthoracic lateral
8. Shoulder
   a. AP internal and external rotation
   b. inferosuperior axial (Lawrence)
   c. posterior oblique (Grashey)
   d. AP neutral
   e. PA oblique (scapular Y)
   f. supraspinatus outlet (Neer)
   g. superior-inferior axial lateral
9. Scapula
   a. AP
   b. lateral
10. Acromioclavicular Joints – AP bilateral with and without weights

B. Lower Extremities

1. Toes
   a. AP, entire forefoot
   b. AP or AP axial toe
   c. oblique toe
   d. lateral toe
2. Foot
   a. AP axial
   b. medial oblique
   c. lateral
   d. AP axial weight bearing
   e. lateral weight bearing
   f. oblique weight bearing
3. Calcaneus
   a. lateral
   b. plantodorsal, axial
   c. dorsoplantar, axial
4. Ankle
   a. AP
   b. mortise
   c. lateral
   d. medial oblique
   e. AP stress
   f. AP weight bearing
   g. lateral weight bearing
   h. mortise weight bearing
5. Tibia/Fibula
   a. AP
   b. lateral
6. Knee
   a. AP
   b. lateral
   c. AP weight bearing
   d. lateral oblique
   e. medial oblique
   f. PA axial – intercondylar fossa (Holmblad)
   g. PA axial – intercondylar fossa (Camp Coventry)
   h. PA axial – intercondylar fossa (Rosenburg)
   i. AP axial – intercondylar fossa (Béclère)
   j. tangential (Merchant)
   k. tangential (Settegast)
7. Patella
   a. PA patella
   b. Lateral patella
8. Femur
   a. AP
   b. lateral
9. Long Bone Measurement

C. Other

1. Bone Survey