Test Your Bone Density Knowledge

LECTURE 11

Osteoclasts are the cells responsible for the building of new bone or bone repair.

a.	True
b.	False

Answer: False

The proximal femur and the lumbar spine are preferred sites for central analysis for bone density.

a.	True
b.	False

Answer: True

Which of the following is NOT a possible risk factor for osteoporosis?

a.	Estrogen deficiency
b.	Alcohol abuse
c.	Excessive body weight
d.	Sedentary lifestyle

Answer: C

Which of the following is NOT a contraindication for a bone densitometry procedure?

a.	Bone mass that is too low
b.	Pregnancy
c.	Recent vertebral augmentation
d.	Childbearing age

Answer: D

The standard(s) being used with dual-energy x-ray absorptiometry to compare the patient's bone density measurements are:

a.	A-score.
b.	Z-score.
c.	T-score.
d.	both B and C.

Answer: D

Which of the following techniques or methods provides bone mineral density (BMD) measurements for both trabecular and cortical bone?

a.	Quantitative ultrasound
b.	Quantitative computed tomography
c.	Dual-energy x-ray absorptiometry
d.	All of the above

Answer: B

Which is the method of choice for evaluating trabecular bone?

a.	Quantitative computed tomography
b.	Dual-energy x-ray absorptiometry
c.	Quantitative ultrasound
d.	Dual-energy photon absorptiometry

Answer: A

A patient with a spine T-score of between –1 and –2.5 is classified according to the World Health Organization as:

a.	normal.
b.	osteopenic.
c.	osteoporotic.
d.	severely osteoporotic.

Answer: B

A patient with a spine T-score of less than or equal to –2.5 (but no fractures) is classified according to the World Health Organization as:

a.	normal.
b.	osteopenic.
c.	osteoporotic.
d.	severely osteoporotic.

Answer: C

A patient's Z-score given in a bone density report:

a.	compares the patient's BMD with that of the normal population.
b.	compares the patient's BMD with that of an age-matched normal population.
c.	compares the patient's BMD with an average individual of the same sex and age.
d.	is the same for all measurement sites.

Answer: C

BMD reporting in premenopausal females or males younger than 50 should be done in Z-scores rather than T-scores.

a.	True
b.	False

Answer: A

An existing vertebral fracture has been shown to double the risk of subsequent fracture.

a.	True
b.	False

Answer: A

The effective dose from a bone density examination of both spine and hip is typically greater than 10 µSv (microSievert).

a.	True
b.	False

Answer: B

Which region of the spine is scanned during a DXA procedure?

a. C7-T-5

b. Sacroiliac joints

c. T-12 to the iliac crest or L5

d. 1 to T-12

Answer: C

Parathyroid hormone when given to a patient will stimulate new bone formation.

a.	True
b.	False

Answer: A

Estrogen replacement therapy is given primarily to:

a.	stimulate new bone growth.
b.	reduce bone loss.
c.	promote healing of stress fractures of the hip.
d.	increase blood flow to bone.

Answer: B

Alendronate (Fosamax) is an example of a(n):

a.	bisphosphonate.
b.	selective estrogen receptor modulator (SERM).
c.	parathyroid hormone.
d.	estrogen.

Answer: A

Reproducibility as applied for DXA systems is also termed:

a.	quality assessment.
b.	system reliability.
c.	accuracy.
d.	precision.

Answer: D

Primary type I osteoporosis is classified as:

a.	premenopausal.
b.	postmenopausal.
c.	senile.
d.	rheumatoid.

Answer: B

Which of the following body parts are scanned when a central DXA is performed?

a.	Lumbar spine and proximal femur
b.	Knee and lumbar spine
c.	Proximal femur and forearm
d.	Forearm and lumbar spine

Answer: A

Which BMD testing method is considered the “gold standard” for diagnosis and monitoring osteoporosis?

a.	QUS
b.	RA
c.	SXA
d.	DXA

Answer: D

What does BMD stand for, as it relates to osteoporosis testing?

a.	Body mass determination
b.	Bone mineral density
c.	Bone muscle distribution
d.	Body mineral density

Answer: B

Which BMD measurement score indicates the number of SDs from the average BMD for the patient's respective age and sex group?

a.	T-score
b.	W-score
c.	V-score
d.	Z-score

Answer: D

Which prime factor of x-ray production controls the quality or penetrating property?

a.	mA
b.	mAs
c.	S
d.	kVP

Answer: D

Which prime factor of x-ray production controls the quantity or intensity property?

a.	mA
b.	S
c.	kVp
d.	Filtration

Answer: A

How many photon energy levels does DXA bone densitometry require?

a.	One
b.	Two
c.	Three
d.	Four

Answer: B

What object is imaged to detect shift or drift in scanner quality control?

a.	Phantom
b.	Filter
c.	Grid
d.	Patient

Answer: A

When, during the day, should daily scanner QC be performed on a normally functioning scanner?

a.	Before the first patient
b.	Between each patient
c.	Between every fifth patient
d.	After the last patient only

Answer: A

The FRAX algorithm gives the ____-year probability of fracture.

a.	5
b.	10
c.	15
d.	20

Answer: B

What is the purpose of vertebral fracture assessment (VFA)?

a.	Measures bone density
b.	Measures fatty tissue
c.	Detects vertebral fractures
d.	Detects hip fractures

Answer: C

What is one advantage of vertebral fracture assessment over conventional x-ray?

a.	Less radiation to patient
b.	Faster scan time to patient
c.	More comfortable for patient
d.	More convenient for patient

Answer: A

What is the most important performance measure in following a patient's BMD over time?

a.	Accuracy
b.	Precision
c.	T-score
d.	Z-score

Answer: B

What type of patients should be used in a precision assessment?

a.	Volunteers representative of the facility's patient population
b.	Volunteers representative of the facility's employees
c.	Volunteers representative of the facility's physicians
d.	Volunteers representative of the facility's ancillary services

Answer: A

What is the preferred region of interest when analyzing a forearm DXA scan?

a.	Ultra-distal ulna
b.	Ultra-distal radius
c.	One-third (33%) ulna
d.	One-third (33%) radius

Answer: D

What are the regions of interest for a lumbar spine DXA scan?

a.	T12 through L3
b.	L1 through L4
c.	L1 through L5
d.	L2 through L5

Answer: B

When scanning a lumbar spine, what is one of the external landmarks used for placement of the central ray?

a.	2 cm below the greater trochanter
b.	2 cm below the iliac crest
c.	2 cm above the xiphoid process
d.	2 cm below the xiphoid process

Answer: B

What positioning aid is typically used during lumbar spine DXA scanning?

a.	Positioning leg block
b.	Positioning spine block
c.	Gonad shielding
d.	Measuring calipers

Answer: A

Which of the following variant anatomy can result in falsely elevated BMD on lumbar spine DXA scans?

a.	50
b.	100
c.	150
d.	200

Answer: B

Which of the following variant anatomy can result in falsely elevated BMD on lumbar spine DXA scans?

a.	Scoliosis
b.	Kyphosis
c.	Lordosis
d.	Spina bifida

Answer: A

When positioning a proximal femur, the patient's feet should always be:

a.	straight.
b.	pointed inward.
c.	pointed outward.
d.	oblique.

Answer: B

Which of the following external landmarks are used for placement of the central ray of the proximal femur?

a.	7 to 8 cm below xiphoid process
b.	7 to 8 cm below greater trochanter
c.	7 to 8 cm above xiphoid process
d.	7 to 8 cm above greater trochanter

Answer: B

What is the chief benefit of using a high and low x-ray energy source with a DXA system?

Answer: C

a.	Reduces patient dose significantly
b.	Reduces wear and tear on the x-ray tube to change energies
c.	Demonstrates attenuation difference between bone and soft tissue
d.	Reduces post-processing time of bone for the digital image

Which vertebral region(s) is (are) analyzed during a DXA scan?

a.	T12
b.	T7 to L1
c.	L1 to L5
d.	L4 to S2

Answer: C

Which of the following is *not* a risk factor for osteoporosis?

a.	Daily physical activity
b.	Alcohol consumption
c.	Low body weight
d.	Low calcium intake

Answer: A

Bone-destroying cells are called:

a.	osteoblasts.
b.	osteoclasts.
c.	cancellous.
d.	cortical.

Answer: B

The most common osteoporotic fracture is found in the:

a.	hips.
b.	femurs.
c.	vertebrae.
d.	ankles.

Answer: C

Precision relates to the ability of the system to:

a.	measure the true value of an object.
b.	reproduce the same results in repeat measurements of the same object.
c.	reflect the bone measurement by the scanner software.
d.	measure the variability of the spread of data values around the mean.

Answer: B

A BMD measurement from a patient is most useful when it can be compared statistically to:

a.	the same patient age population.
b.	a population living in the same area.
c.	multiple scans on the same patient.
d.	an appropriate sex-matched reference population.

Answer: D

Risk factors for falling and causing fractures are:

1. antidepressants.
2. impaired muscle strength.
3. environmental hazards.

a.	1 and 2
b.	1 and 3
c.	2 and 3
d.	1, 2, and 3

Answer: D

Radiation dose for DXA scans is:

a.	twice as much as for a diagnostic lumbar x-ray.
b.	half as much as for a lumbar CT examination.
c.	similar to natural background radiation.
d.	similar to a diagnostic hand x-ray.

Answer: C

The T-score is used to assess:

a.	the reference population.
b.	fracture risk for the patient.
c.	if the measured BMD is reasonable.
d.	patient age and bone loss.

Answer: B

The Z-score is used to determine:

a.	the reference population.
b.	fracture risk for the patient.
c.	if the measured BMD is reasonable.
d.	patient age and bone loss.

Answer: C

Patient positioning should be exactly the same for all scans because:

a.	the images need to look the same over time.
b.	the results will be more precise, reflecting a true biologic change.
c.	that will allow scans from different manufacturers to be comparable.
d.	radiologists want the same positioning to read the images.

Answer: B

When obtaining patient history for a bone density exam the technologist should obtain the patient's:

1. history of fractures.
2. standing height and weight.
3. insurance information.

a.	1 and 2
b.	1 and 3
c.	2 and 3
d.	1, 2, and 3

Answer: D

The measurement of bone density uses two different beam energies, allowing the separation of soft tissue and bone due to:

a.	filtration differences in the beam.
b.	mass attenuation coefficient differences.
c.	BMD population calculations.
d.	the two-dimensional area.

Answer: B

Thank You