ST VINCENTS / OPTIMAL IMAGING DEXA GUIDELINES

PURPOSE

- To standardize the performance of and reporting of dual energy x-ray absorptiometry (DEXA) examinations based on ACR, International Society of Clinical Densitometry (ISCD) and Bone Health and Osteoporosis Foundation (BHOF) recommendations/guidelines.

GENERAL COMMENTS

- Appropriate and billable indications for DEXA examinations include: age-related osteoporosis, asymptomatic menopausal state, unspecified menopausal or perimenopausal disorder, menopausal and female climacteric states, primary ovarian failure, asymptomatic or symptomatic premature menopause, disorders of bone density or structure, hyperparathyroidism, Cushing's syndrome, fatigue/insufficiency of spine, vertebral collapse, personal history of osteoporotic fracture, long-term current use of systemic or inhaled steroids, long-term current use of other agents affecting estrogen receptors and estrogen levels, and long-term current use of bisphosphonates.
- Patient examinations should be performed on the same unit as the most recent examination (if possible). Patient examinations are not comparable across different DEXA units unless the units have been cross-calibrated.

DEXA REPORTING (FOR RADIOLOGISTS)

- A lumbar vertebral level should be excluded from BMD determination if its T-score is different by >1.0 from an adjacent level or if the evaluation of a level is degraded by extensive degenerative changes, surgical hardware, mass lesions or artifacts.
- The lumbar spine BMD should only be reported if at least two vertebral levels are included in the BMD determination.
- The patient should receive only one overall assessment categorization for the exam impression using only the lowest T-score or Z-score from lumbar spine, unilateral total hip (not mean), unilateral femoral neck (not mean) or proximal third (33%) forearm. An assessment category should not be provided for each anatomic site. The mean of both hips, mean of both femoral necks and total forearm are not used for overall assessment categorization.
- T-scores are reported in postmenopausal/perimenopausal females and in men ≥50 years of age. T-scores are referenced to a young white female population.

WHO Category	T-Score
normal	≥ -1.0
osteopenic	< -1.0 to > -2.5
Osteoporosis	≤ -2.5

- Z-scores are reported in premenopausal females, in men <50 years of age and children and adolescents. Z-scores are referenced to population-specific age-matched populations.

Category	Z-Score
BMD within the expected range for age	> -2.0
BMD below the expected range for age	≤ -2.0

- FRAX scores should only be reported in patients who meet all of the following conditions (per ISCD/BHOF guidelines):
  1) Are osteopenic (e.g. not normal or osteoporotic).
  2) Are perimenopausal/postmenopausal females or men ≥50 years of age (i.e. a T-score is reported rather than a Z-score).
  3) Have no history of treatment of osteoporosis with prescription medications (e.g. bisphosphonates, estrogens, hormone replacement, selective estrogen receptor modifiers SERMs, calcitonin, parathyroid hormone, denosumab, etc). Treatment with calcium or vitamin D does not exclude FRAX use.
  4) Have no history of vertebral or hip fracture.
- Normal FRAX scores <20% for global fracture and <3% for hip fracture.
- TBS should only be reported in patients of either sex age ≥40 years with BMI 15-37 kg/m^2.

Category	TBS Score
normal bone microarchitecture	> 1.31
partially degraded bone microarchitecture	1.23-1.31
degraded bone microarchitecture	< 1.23

DEXA PERFORMANCE (FOR TECHNOLOGISTS)

- Have the patient complete the DEXA Patient Questionnaire. The most current version is available on the svrads references website.
- The patient must be positioned properly, and the correct ROIs for BMD measurement must be used. Positioning devices (pillows/cushions) cannot be within the imaging FOV.
- Standard anatomic sites for imaging include the PA lumbar spine and one or both hips. Additional anatomic sites of imaging include the forearm or whole body.
- For evaluation of the lumbar spine:
  1) Standard imaging includes vertebral levels L1 through L4.
  2) A vertebral level should be excluded from BMD determination if its T-score is different by >1.0 from an adjacent level or if the evaluation of the level is degraded by extensive degenerative changes, surgical hardware, mass lesions or artifacts.
- For evaluation of one or both hips:
  1) Standard imaging includes total hip and femoral neck.

2) One or both hips should be excluded from BMD determination if the evaluation is degraded by extensive degenerative changes, surgical hardware, mass lesions or artifacts.

- For evaluation of the forearm:
  1) Imaging of the nondominant forearm is preferred over the dominant forearm.
  2) Evaluation of the forearm should be included if requested by the ordering provider or in patients whose spine and/or hips cannot be evaluated, patients with hyperparathyroidism and obese patients over the imaging unit's weight limit.
  3) A forearm should be excluded from evaluation if evaluation is degraded by extensive degenerative changes, surgical hardware, mass lesions or artifacts.

HOLOGIC SOFTWARE SETTINGS (FOR TECHNOLOGISTS)

- FRAX scores should not be reported in the following patients: premenopausal women, men <50 years of age, patients with BMD ≥ -1.0 (normal) or ≤ -2.5 (osteoporotic), patients with history of treatment for osteoporosis with prescription medications (calcium & vitamin D are allowed) and patients with history of prior hip or spine fractures.
- FRAX scores should only be calculated using the BMD of the femoral neck.