

OSTEOPOROSIS 2014

New Standards for BMD Reporting

Fracture Risk Determination



PROVIDING IMAGING EXCELLENCE



The Canadian Association of Radiologists (CAR) sets the standards for reporting bone densitometry. Previously, reporting has been based on CAR BMD Standards of 2010. CAR has recently established a new set of standards (CAR Technical Standards for Bone Mineral Densitometry Reporting 2013) that incorporate principles set out in new guidelines from Osteoporosis Canada (Papaioannou et al.; Can Med Ass J; 2010; 182:1864-1873 and Lentle et al.; Can Assoc Radiol J; 2011;62:166-175). The new standards incorporate substantial changes to how BMD is to be reported and this will affect the reports you receive on your patients.

Medical Imaging Consultants is committed to optimizing the transition to the new reporting approach. This newsletter is intended to provide information on the contents of the BMD reports you will receive from Medical Imaging Consultants and to provide guidance about how the new reporting standards impact on your patients.

The way in which fracture risk is determined for an individual has changed substantially under the new standards

Changes to Fracture Risk Determination

In 2005, CAR and Osteoporosis Canada introduced absolute risk determination for patients 50 years of age or older. There have been three fracture risk categories, indicating fracture risk over the subsequent 10 years: Low risk (<10%), Moderate risk (10-20%), and High risk (>20%). These risk categories remain in effect, but the way in which the risk is determined for an individual has changed substantially under the new standards. This approach is based on risk determination guidelines suggested by OC.



New Fracture Risk Curves/Tables

The risk curves/tables previously used were referred to as CAROC. These have been replaced by a new set of tables and are called CAROC 2010 or CAROC2. There is a curve/table for women and a curve/table for men.

How The Risk Curves/Tables Are Used

CAROC 2010 is applied in the same general way as was done in the past with CAROC. An individual's T-score, age, and sex is used to determine the fracture risk category. If fragility fracture history is positive or if glucocorticoid history is positive, the fracture risk category is increased to the next highest level.

FRAX

An alternate system for determining fracture risk is called FRAX. Both CAR and OC have declared that FRAX is not to be used to determine fracture risk. The fracture risk reported by Medical Imaging Consultants will be derived using CAROC 2010.



Changes in Skeletal Sites Used to Determine Fracture Risk

The most marked change is that only the femoral neck T-score is used in the CAROC 2010 system, whereas previously, multiple skeletal sites were used with CAROC. Further, the femoral neck T-score used for determining fracture risk in men is derived on a *female* database, not a male database as in the past. This means you will see two T-score values for the femoral neck on reports for your male patients, one derived from the male reference database (for the diagnostic category) and one from the female reference database (for fracture risk determination). All other skeletal site data on a male report will be from a male database only.

Other Skeletal Sites

There is one circumstance in which the spine BMD is used. If risk is determined to be Low after using the femoral neck and clinical factors, then the spine T-score is examined. If it is ≤ -2.5 , then the risk category is increased to Moderate. The T-score for the spine is derived from a male database for men.



Automatic High Fracture Risk History

Another change is that there are several circumstances that lead to High risk designation regardless of the BMD value. Previously, the only circumstance where this occurred was when both fragility fracture history and glucocorticoid history were positive. The new standards provide for High risk in the following additional circumstances:

- ◆ Fragility hip fracture
- ◆ Fragility vertebral fracture
- ◆ More than one fragility fracture at other sites

This makes the history that you provide on the requisition particularly important. Your assessment of whether your patient's fractures should be regarded as fragility fractures will have a pivotal influence on the risk category we assign.



Definition of Positive Glucocorticoid History

The new standards have changed the definition of positive glucocorticoid history that is used to increase the fracture risk category. The previous definition was > 7.5 mg/d of prednisone for the 3 months leading up to the day of the DXA scan. The new definition is ≥ 7.5 mg/d for 90 cumulative days in the prior 12 months. The patient no longer needs to be on steroids on the day of BMD testing for history to be considered positive, and patients on exactly 7.5 mg/d are considered positive whereas they were not in the past. An exception has been introduced, which is that hypoadrenal patients on replacement are not considered positive regardless of steroid dosage. It should be noted that this dosing applies to risk determination only, not to the indication for BMD testing of patients on chronic steroids. Those taking as little as 2.5 mg/d of prednisone (or equivalent) for a number of months, those receiving intermittent high dose steroids, those on high doses of inhaled steroids, and patients receiving more than four large-joint injections per year may benefit from BMD testing.



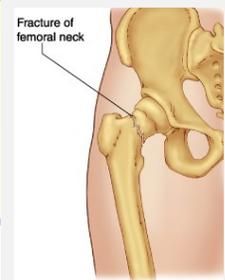
UNDEFINED FRACTURE RISK SCENARIOS

Under the new system, fracture risk cannot be defined in certain patients:

- ◆ Femoral neck and spine not available (as occurs in OA affecting both sites, surgery or prostheses to both sites, or in the obese who exceed the table weight limit and can only have forearm scans)
- ◆ Femoral neck unavailable and spine T-score > -2.5

UNDERESTIMATED FRACTURE RISK SCENARIOS

Additionally under the new system, risk is underestimated when the femoral neck T-score is much greater than one or more other skeletal sites. It is well-documented that the lowest site provides the most accurate estimation of fracture risk, particularly for that site, but this is not considered in the OC-based system.



Key Messages

1. The new approach to determining fracture risk differs from the old approach in several fundamental ways
2. Some of your patients who have been tested under the old system may be assigned a different fracture risk category with their first scan under the new system
3. Fracture risk cannot be assigned for some patients under the new system
4. Fracture risk will be underestimated for some patients under the new system
5. There are certain clinical fracture histories that now lead to High Risk regardless of the BMD T-score



CAROC 2010 Ten-Year Fracture Risk for Women

Femoral Neck T-score			
Age (years)	Low risk (<10%)	Moderate risk (10% to 20%)	High risk (> 20%)
50	Greater than -2.5	-2.5 to -3.8	Less than -3.8
55	Greater than -2.5	-2.5 to -3.8	Less than -3.8
60	Greater than -2.3	-2.3 to -3.7	Less than -3.7
65	Greater than -1.9	-1.9 to -3.5	Less than -3.5
70	Greater than -1.7	-1.7 to -3.2	Less than -3.2
75	Greater than -1.2	-1.2 to -2.9	Less than -2.9
80	Greater than -0.5	-0.5 to -2.6	Less than -2.6
85	Greater than +0.1	+0.1 to -2.2	Less than -2.2

CAROC 2010 Ten-Year Fracture Risk for Men

Femoral Neck T-score			
Age (years)	Low risk (<10%)	Moderate risk (10% to 20%)	High risk (> 20%)
50	Greater than -2.5	-2.5 to -3.9	Less than -3.9
55	Greater than -2.5	-2.5 to -3.9	Less than -3.9
60	Greater than -2.5	-2.5 to -3.7	Less than -3.7
65	Greater than -2.4	-2.4 to -3.7	Less than -3.7
70	Greater than -2.3	-2.3 to -3.7	Less than -3.7
75	Greater than -2.3	-2.3 to -3.8	Less than -3.8
80	Greater than -2.1	-2.1 to -3.8	Less than -3.8
85	Greater than -2.0	-2.0 to -3.8	Less than -3.8

Values in the tables are taken from Lentle et al.; Can Assoc Radiol J 2011;62:166-175.

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