OSTEOPOROSIS 2014
New Standards for BMD Reporting Diagnostic Categories

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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.

Adults 50 Years of Age and Older

WOMEN

- The term Osteopenia, which has been in use since 1996, is no longer used
- Women previously classified as having Osteopenia (T-score between -1 and -2.5) will now be called Low Bone Mass
- Normal (T-score ≥ -1) and Osteoporosis (≤ -2.5) continue in use

MEN

- Since the 2005 CAR/OC guidelines, men were given two classifications: Normal and Reduced
- Men over 50 years now have the same classifications as women
- The Normal category has now been subdivided
- Men with T-scores between -1 to -2.5 were previously included in the Normal category, but are now classified as having Low Bone Mass, while those with T-scores > -1.0 continue to be labelled as Normal
- Men with T-scores ≤ -2.5 were previously classified as Reduced Bone Density but are now classified as having Osteoporosis

Patient Group	Category Name	T-Score Value
50 Years and Older	Normal	≥ -1.0
	Low Bone Mass	Between –1 and –2.5
	Osteoporosis	≤ -2.5

Women and Men 18 to 50 Years of Age

There has been a complete change in the way this age group is assigned a diagnostic category.

- The main change: Instead of T-scores, diagnostic classification is now based on Z-scores
  - T-score definition: number of standard deviations above or below the mean peak density at that skeletal site for the same sex (i.e. the comparison is made to young adults)
  - Z-score definition: number of standard deviations above or below the mean density for an individual of that age and sex (i.e. compared to same age)
- Previously, categories based on T-scores were termed Normal and Reduced Bone Density
- Now categories based on Z-scores are termed Within Expected Age for Range (Z-score > -2.0) and Below Expected Range for Age (Z-score ≤ -2.0)
- Note that the threshold using Z-scores is -2.0 SD rather than -2.5 SD as previously applied to T-scores

> Changes in your patient's terminology should not be interpreted as improvement in skeletal status

- There will be a major effect on patient classification. The reasons for this are:

  - The normal profile with increasing age is declining BMD after age 16 years at the hip and after age 28 years at the spine
  - Since T-score compares to peak BMD, T-score falls in the same way BMD does
  - Since Z-scores compare to average for a person of the same age, the age-related decline is eliminated when Z-scores are used
  - The net effect is that in the 30s and 40s, an individual's Z-scores will be higher than their T-scores

- Some of your patients previously classified as Reduced BMD under the old system will now be Within Expected Range for Age even though there has been no change in BMD
- In addition, many patients who are classified as

Within Expected Age for Range under 50 years of age will be classified as Low Bone Mass or Osteoporosis when they come back for their first test after 50 years, even with no change in BMD

This change in diagnostic category terminology should not be interpreted as improvement in skeletal status.

Statistically significant change in absolute BMD continues to be the marker of improvement in status.

Changes to BMD Diagnostic Categories

There have been substantial changes to diagnostic categories assigned to individual patients, either in terms of how the categories are defined and derived or the names given to the categories.

As previously, diagnostic categories are assigned differently for adults 50 years of age or older and for adults under age 50. The greatest changes have occurred for adults in the age range of 18 to 50 years.

For all adults (18 years or older), the diagnostic category is assigned based on the lowest value from the spine, total hip, and femoral neck. The trochanteric region and Ward's area of the proximal femur are not used. If the spine is not available, both hips may be scanned. If either the spine or hip are not available, the forearm (the 1/3 radius sub-region) or total body values may be used instead. The reference database used is the white database for the same sex; race or ethnic-specific databases are not used. T-scores are used for men and women ≥ 50 years old while Z-scores are now used for those < 50 years.

Patient Group	Category Name	Z-Score Value
Under Age 50	Within expected range for age	>-2.0
	Below expected range for age	≤-2.0

Children Under 18 Years

- Z-scores are used, as previously
- Scanned sites are the spine and total body
- Names of categories have changed
- Normal is now called Within Expected Range for Age (Z-score > -2.0)
- Reduced Bone Density is now called Below Expected Range for Age (Z-score ≤ -2.0)

Key Messages

1. Do not use the diagnostic category to evaluate changes in your patient's status as the diagnostic category name changes could lead to misinterpretation.

2. Changing bone status is reflected in the changes in absolute BMD, which will be stated on the BMD report

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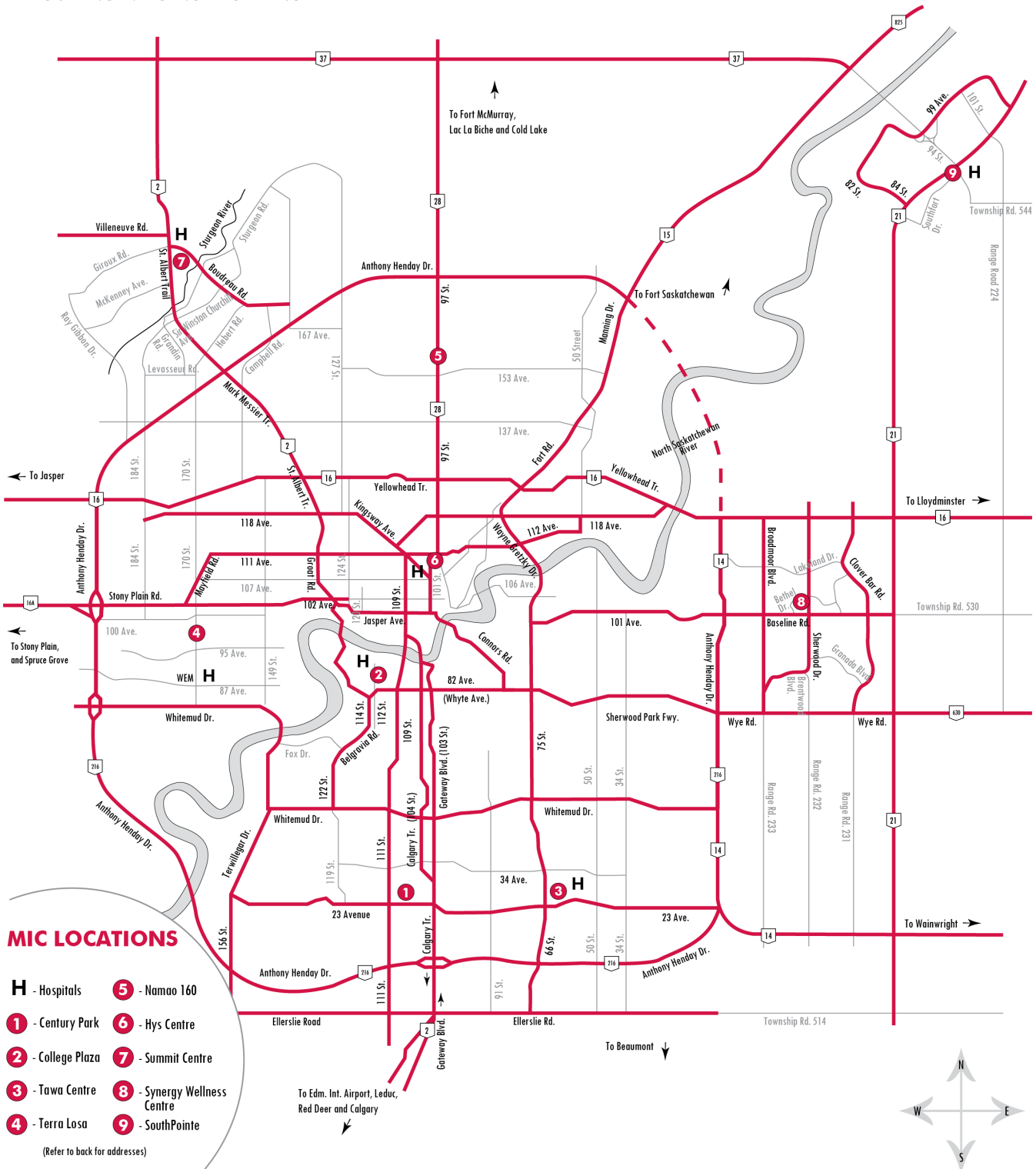PROVIDING IMAGING EXCELLENCE

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Revised 10/12