

# Frequency of Certified Clinical Densitometrist (CCD) Reclassification of Fracture Risk Based on Lowest T-score: A Multi-Specialty Clinic's Experience

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## Background

We have developed semi-automated reporting software to facilitate DXA reporting for our medical center. Middletown Medical offers bone densitometry mostly utilized by the clinic's 20 primary care and specialty providers. The purpose of this study was to quantify the extent to which the clinic endocrinologist (a CCD) modified the referral recommendations generated by the T-score driven computer algorithm.

## Methods: Fracture risk assessment

Spine and hip DXA was performed by a certified radiology technologist (RT) on a Hologic QDR-1000. Fracture risk estimates were derived from lowest T-score (L1-L4, Total hip, Femur Neck, Femur Trochanter) and the resulting 10-year fracture risk was categorized as Low or Moderate/High (>10%) [Can Assoc Radiol J 2005; 56: 178-188]. The CCD then either accepted or altered the fracture risk estimate after review of the DXA scan images, prior scan results, osteoporosis questionnaire, and diagnosis and medication lists.

## Methods: Comparison of T-score with CCD risk assessment

We retrospectively studied reports over 8 months of 466 consecutive patients referred for DXA. Each record was scored for concordance of T-score generated and CCD recommendations and for osteoporosis diagnosis, family history, past fractures, thinness, smoking and corticosteroid use. Demographic and clinical predictors of reclassification by CCD were tested for significance using the two-sided probability from the Fisher exact test, available online at <http://www.quantitativeskills.com/sisa/statistics/fisher.htm>.

## Main results

**36/248 (15%) of patients with low fracture risk by T-score were reclassified as medium/high risk by a CCD.**

**36/218 (17%) of patients with medium/high fracture risk by T-score were reclassified as low risk.**

## Reclassification by patient subgroup

Patient demographics:

- mean age: 61 years
- 416/466 (89%) female
- 238/466 (51%) no previous scan
- 306/465 (66%) White, 63 (14%) Black, 89 (19%) Hispanic, 5 (1%) Asian, 2 (<1%) other

Demographics associated with reclassification:

- age
- male gender
- previous scan history

Clinical factors associated with reclassification:

- previously diagnosed with osteoporosis
- non-thin BMI
- nonsmoker
- family history

*Fraction of cases with low T-score risk reclassified high by CCD:*

- age < 65: 6/190 vs. 30/56 for age >=65 (p = 0.000000000)
- male: 1/26 vs. 35/222 for female (p = 0.14)
- no previous scan: 15/150 vs. 21/98 previously scanned (p = 0.016)
- Hispanic: 6/46 vs. 26/158 White (p = 0.65)
- Black: 4/40 vs. 26/158 White (p = 0.46)
- osteoporosis Rx: 6/11 with, 30/237 w/o (p = 0.002)
- fracture history: 3/31 with, 33/217 w/o (p = 0.59)
- thinness: 0/7 with, 36/241 w/o (p = 0.60)
- smoking: 4/65 with, 32/183 w/o (p = 0.02)
- corticosteroid use: 0/11 with, 36/237 w/o (p = 0.37)
- family history: 2/28 with, 34/220 w/o (p = 0.39)

*Fraction of cases with high T-score risk reclassified low by CCD:*

- age < 65: 33/122 vs. 3/96 age >=65 (p = 0.0000007)
- male: 14/24 vs. 22/194 female (p = 0.0000006)
- no previous scan: 21/88 vs. 15/130 previously scanned (p = 0.025)
- Hispanic: 4/43 vs. 30/148 White (p = 0.12)
- Black: 2/23 vs. 30/148 White (p = 0.26)
- osteoporosis Rx: 1/43 with, 35/175 w/o (p = 0.003)
- fracture hx: 10/47 with, 26/171 w/o (p = 0.37)
- thinness: 1/38 with, 35/180 w/o (p = 0.008)
- smoking: 13/56 with, 23/162 w/o (p = 0.14)
- corticosteroid use: 6/26 with, 30/192 w/o (p = 0.40)
- family history: 9/27 with, 27/191 w/o (p = 0.02)

## Conclusions

The relatively high rate of reclassification we found supports the value of specialist review of densitometry scans.