

# Osteopenia Screening Utilizing a Novel CT based DEXA Equivalent Algorithm

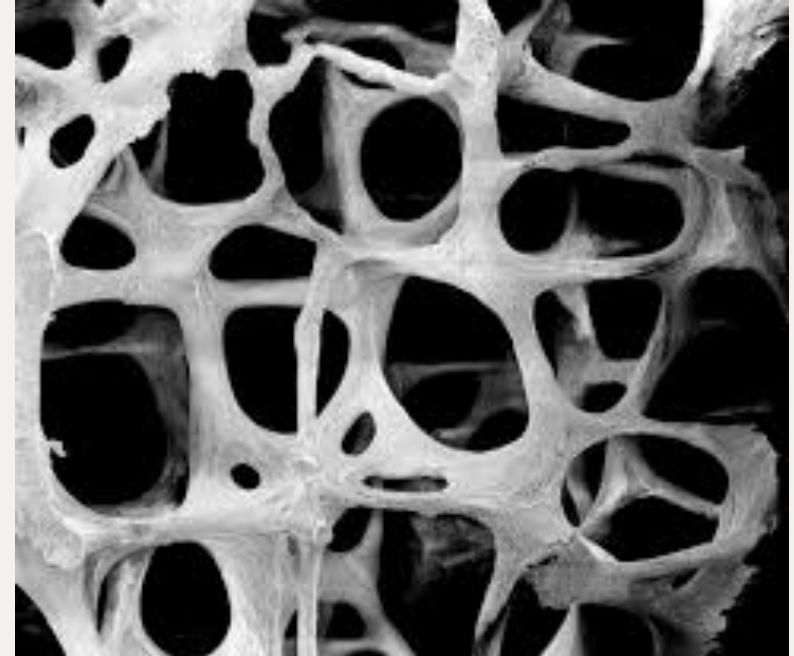
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# Disclosures

- The algorithm tested was developed by and is owned by Zebra Medical Vision, LTD.
- Orna Amitai-Bregman and Dr. Eldad Elnekave are employees of Zebra Medical Vision, LTD.
- The other authors have no relevant disclosures

# Background

- Osteoporosis affects 17% of the population in the United States
- Fragility fractures in women cost the US 17 billion dollars annually
- Patients are often undiagnosed and untreated
- Fewer than 50% of eligible Medicare recipients undergo bone mineral density screening



# Background

- Approximately 50% of fragility fractures occur in patients with osteopenia
- Quantitative Computed Tomography used as a screening method for osteoporosis has been described
- CT is widely used



# Purpose

- To determine if an automated T-score CT based algorithm (Zebra Medical Vision™) is an accurate, DEXA equivalent screening tool, for identifying osteoporosis in patients older than 55 years old

# Methods

- Randomized retrospective review consisting of 157 patients
- CT studies of the chest, abdomen and lumbar spine (T12-L5) and corresponding DEXA scans performed within 12 months of one another were evaluated
- Outcomes
  - DEXA derived T-Score
  - CT based algorithm derived T-Score

# CT Algorithm

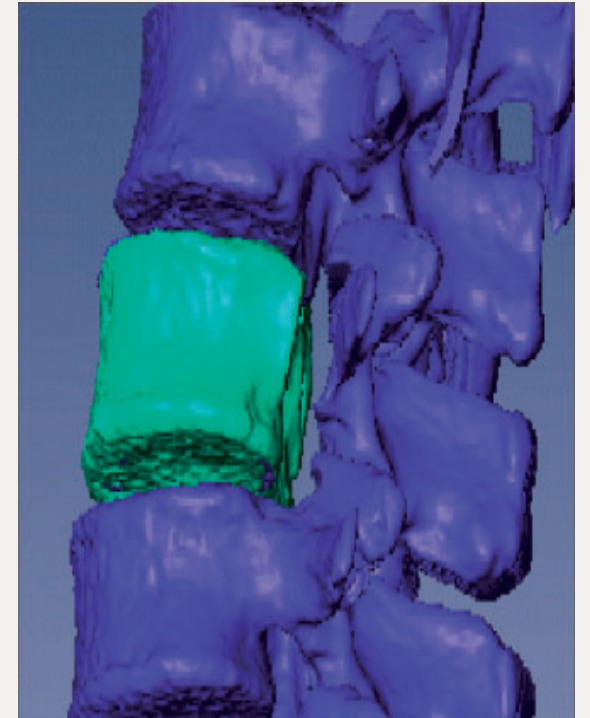
- Fully automated
- No radiologist necessary
- Uses existing CTs as screening studies
- Outputs T-score, similar to DXA





# Results

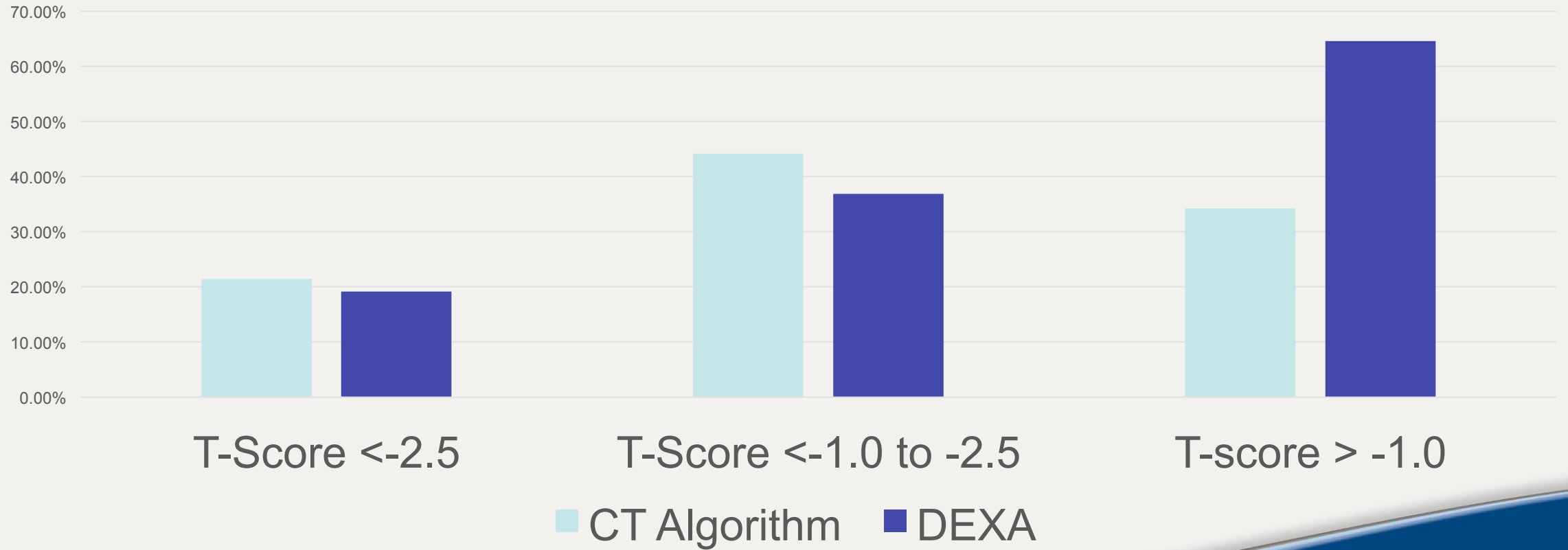
- CT based group (N=172)
  - 37 patients osteoporotic (T-Score < -2.5)
  - 76 patients osteopenic (T-Score < -1 to -2.5)
  - 59 patients normal (T-Score > -1.0)
- DEXA group (N=130)
  - 25 patients osteoporotic (T-Score < -2.5)
  - 48 patients osteopenic (T-Score < -1 to -2.5)
  - 84 patients normal (T-Score > -1.0)





# Results

## CT Algorithm versus DEXA Screening for Osteoporosis



# Results

- Significant association between being identified as osteopenic with DEXA screening and via the CT algorithm based screening method ( $p < 0.001$ )
- CT algorithm based screening method had a sensitivity of 0.93 and a specificity of 0.46

# Results

- On average, Lumbar DEXA scores were higher than CT based scores ( $p < 0.001$ )
- Intra-class Correlation Coefficient (ICC) was 0.55 (CI 0.43, 0.65)
  - Moderate agreement (Landis and Koch, 1977)

# Conclusion

- Identified a significant association between Lumbar DEXA and CT based screening methods
- The CT based algorithm was sensitive for detection of osteoporosis but demonstrated low specificity
- This represents a possible tool for screening
- Additional study will be needed to determine cost effectiveness and the full impact of mass screening

# References

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Thank you

