

DXA Standards Survey Summary

ISCD-NIST DXA Survey: Preliminary Report^{*†}

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In February 2006 at the ISCD-NIST Workshop on Standards and Measurements for Assessing Bone Health, 55 attendees defined and discussed a list of standards and measurement needs to increase accuracy and cross-manufacturer comparability of dual-energy X-ray absorptiometry (DXA) measurements of bone mineral density (BMD).⁽¹⁾ We further refined the list appearing in (1) to minimize overlap and obtained the following standards and measurement needs:

- Development of phantoms that validate accuracy at all DXA scan sites and that establish measures of BMD in units of g/cm² and g/cm³ that are traceable to the International System of units (SI units). [Phan]
- Standardization of edge-finding algorithms and their performance with respect to different soft-tissue and density conditions. [Alg]
- Standardization of regions of interest (ROI) for all axial DXA scan sites. [ROI]
- Development of more complete reference databases for the purpose of consistent evaluations of T- and Z-scores. [DB]
- Standardization across manufacturers of quality assurance (QA) and quality control (QC) protocols for assessing drifts in calibrations. [QA/QC]
- Standardization of content and format for DXA reports to enable comparisons among equipment models and manufacturers. [Report]
- Standardization, ROIs, reference data, and the like for all peripheral densitometric scan sites. [Periph]

The quantities in square brackets [...] denote the abbreviations that we use for each of the seven action items. We used an online survey to determine the priority rankings of the above needs as assessed by a broad cross section of the bone health community.

The survey ran for six weeks from 10/23/07 through 12/04/07. The ISCD received 1,074 completed Survey responses from members of seven societies – ISCD, AACE, ACRheum, ASBMR, NAMS, NOF, and TES – several countries, and multiple medical specialties with an interest in DXA measurement of BMD.

Acknowledgments

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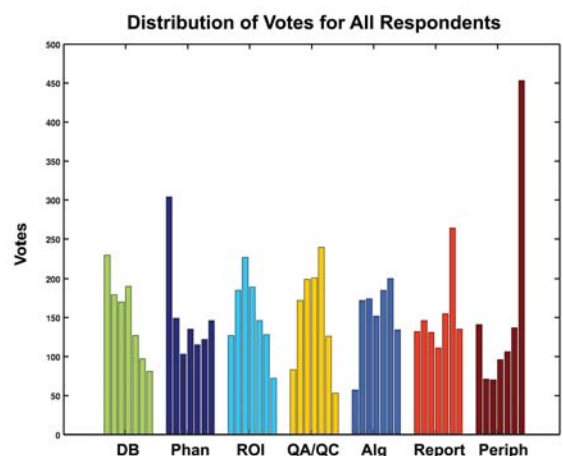


Fig. 1

Figure 1 shows histograms for the distribution of votes. Each of the seven action items in Figure 1 has 7 bars associated with it. The first bar on the left is the number of respondents who gave that action item a rank of 1. The next bar is the number of respondents who gave that action item a rank of 2 and so forth. A rank of 1 is the highest priority and a rank of 7 is the lowest priority.

We conclude from computing Kendall's coefficient of concordance that the null-hypothesis that all action items are equally preferred may be rejected with high confidence ($p < 0.005$). (2) We find that the median ranks of action items for all respondents are such that the 95% confidence intervals for the several action items do not overlap. This finding further supports the results of the concordance statistic. We sort the action items by median to determine the following prioritization:

- The development of standard phantoms, regions of interest, and reference databases all received median ranks of 3. As a group these are the top three most important action items.
- Algorithms and QA/QC both received median ranks of 4 and as a group are the second most important action items.
- Report and Peripheral received respectively median ranks of 5 and 6 and are respectively the third and fourth most important action items and so have low priority rankings.

The above prioritization by median score respects the ordinal nature of the preference data. We intend to publish a more complete analysis comparing the above results with results based on voting theories. Additionally, we will explore the data for possible correlations between priority rankings and demographic data such as geographic location and medical specialty.

equipment or materials are necessarily the best available for the intended purpose.

^{*}A contribution of the U. S. National Institute of Standards and Technology, not subject to copyright.

References

- 1 H. S. Bennett, A. Dienstfrey, L. Hudson, T. Oreskovic, T. Fuerst, and J. Shepherd. Standards and Measurements for Assessing Bone Health—Workshop Report Co-Sponsored by the International Society of Clinical Densitometry (ISCD) and the National Institute of Standards and Technology (NIST), *Journal of Clinical Densitometry*, October 2006 9(4): 399-405.
- 2 M. G. Kendall and B. B. Smith. The Problem of M Rankings. *The Annals of Mathematical Statistics*, September 1939 10(3): 275-287.



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2007 Official Positions

The 2007 ISCD Official Positions have received the endorsement of:

- the American Association of Clinical Endocrinologists (AACE)
- the American Society for Bone and Mineral Research (ASBMR)
- The Endocrine Society (TES)
- the North American Menopause Society (NAMS) (*endorsement of sections pertaining to the menopausal woman*).

Additional endorsements from other allied societies are forthcoming.

Translated Official Positions

Translations of the 2007 Official Positions have been posted online. We currently have translations into Chinese and Portuguese. Additional translations are in progress. Links to the translations can be found in the Official Positions section of our Web site as well as in the International section of the site.

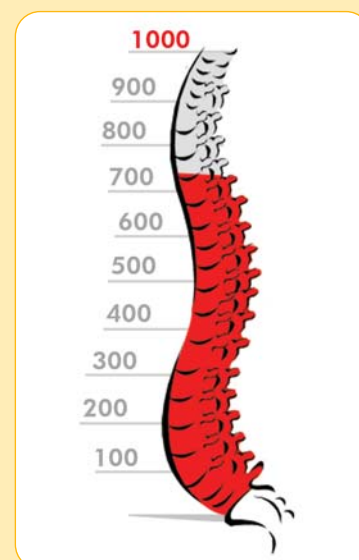
Official Positions Brochure

The 2007 Official Positions printed brochures will be available this month. All members will be mailed one copy of the brochure in May. Additional copies are available for purchase in the BoneYard section of the ISCD Web site.

2007 Updated Official Positions Slideshow

A 2007 updated ISCD Official Positions PowerPoint Slideshow is now posted on the Web site. Full text of the 2007 Official Positions is also posted online.

Membership Campaign Update



Keep Recruiting!

With your help we can reach our goal. We are currently at 73% with 730 new members so far in this campaign period.

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