Imaging societies and members have a major stake in quantitative imaging and imaging biomarkers, because of what the future demands of us, and what we can do to help develop the field.

Imaging advances continue to heap increasing volumes of data on clinical imagers, creating pressure to improve workflow, accuracy of lesion detection and classification, and reporting and communication. Though some view the commoditization of medical imaging as inevitable, the new generation of imaging experts will add value to personalized medicine through quantitative imaging by sorting responders from non-responders before treatment, rapidly assessing response to therapy already initiated, verifying targeting of “theragnostics”, measuring response to therapy, and rendering prognostic information. Clinical trialists will provide image data that meets surrogacy criteria for therapeutic response, thereby helping to streamline approval of new drugs and biologics.

Much will be required to achieve the aforementioned, including: harmonized image acquisition protocols; validated software algorithms for detection, classification, and measurement of therapeutic response; hardware and software standards for diagnostic imaging and image-guided intervention; validated reference image databases for testing algorithms and benchmarking performance; a standardized ontology such as RadLex; and structured reporting. In addition, a massive culture shift in training and practice will be required, to leave behind the era of qualitative interpretation, pattern recognition, and apprenticeship in favor of standardized methods, quantitative analysis, and robust informatics. Only in this way will clinical imagers add value and contribute to personalized medical decision making.

Professional societies, only one of many stakeholders, can do a great deal to advance quantitative imaging and the qualification of imaging biomarkers. Society meetings can serve to convene the stakeholders for updates, dialogue and planning. Annual meetings can provide a forum for presentations on the latest science in imaging biomarkers. Efforts to reduce measurement uncertainty can be and are being conducted by the various specialty societies. Additional coordination may serve an important accelerating purpose. Imaging biomarkers qualification will demand special focus on methodology. Societies can organize workshops to address the most important methodological questions and publish the proceedings. In addition, professional societies can help to facilitate the development of consensus standards among industry stakeholders. Societies may also be able to play a role in training and qualifying clinical trialists and imaging scientists, and organizing teams of qualified trialists to conduct clinical trials with imaging endpoints. Finally, societies can provide infrastructure and tools that enable the conduct of trials, and can help internationalize all imaging biomarkers efforts.

In summary, quantitative methods are vital to the future of medical imaging, research, informatics, and personalized medicine. Imaging professionals must adjust to add value, and training programs must transform. Professional imaging societies can play several extremely important roles in the advancement of quantitative imaging and imaging biomarkers.
AbstractID: 7967 Title: Imaging societies as important stakeholders for quantitative imaging

EDUCATIONAL OBJECTIVES:

1) Envision the quantitative imaging departments and training programs of the future, a future in which personalized medicine will demand added value from imaging professionals;

2) Know at least eight ways in which societies can contribute to the advancement of quantitative imaging and imaging biomarkers.