QIBA Biomarker Committee accomplishments, Quarter 3, 2020

BC	From	BC Accomplishment
CT SLN	Dr. Gierada	Technical confirmation of Profile approved by committee vote. Currently reconciling test site feedback issues, completion of comment resolution spreadsheet, and reconciliation of discrepancies between Profile requirements and Checklist.
CT Vol	Found via Google Scholar	**Manuscript Published**: – Hoye J, Solomon JB, Sauer TJ, Samei E, Quantification of Minimum Detectable Difference in Radiomics Features Across Lesions and CT Imaging Conditions, *Academic Radiology*, 2020, ISSN 1076-6332, https://doi.org/10.1016/j.acra.2020.07.029 **Summary findings were**: QIBA protocol recommendations result in improved minimum detectable difference as compared to the range of possible protocols. The results showed that the minimum detectable differences may be improved from QIBA's current recommendation by further restricting the slice thickness requirement to be between 0.5 mm and 1 – posted to LinkedIn on 8/24
ASL	Dr. Golay	The QIBA ASL Biomarker Committee has received funding from the European Union Horizon 2020 Framework Programme that will define the way to use biomarkers in clinical trials: https://lnkd.in/dC3JEJp.
DCE-MRI	Dr. Laue	The DCE-MRI BC has been focusing on finalizing the DCE-MRI Profile 2.0 and will submit this for comment within the coming weeks. The Profile 2.0 was adapted to the new QIBA Profile template. Additionally, it now includes site-specific information for the brain, prostate, breast, and head and neck. The protocol section has been updated with recent MRI sequence developments. B1+ inhomogeneity at 3T is addressed now. We adjusted the actor list, updated the task list, and adapted the conformance section.

DWI	Dr. Boss	1. Dr. Malyarenko agreed to help lead the BC as a co-chair; Dr. Chenevert rotated off. 2. DWI Profile used by INVICRO CRO for implementation in brain and renal clinical trials. Based on INVICRO feedback, technical Profile conformance guidelines are being improved. There are ongoing discussions of use of DWI Profile for site qualification in INVICRO-managed trials. This collaboration has been very useful for assessing the use of the QIBA DWI ice-phantom and associated analysis software (QIBAPhan) from previously funded QIBA groundwork projects (Rounds 3 and 4 of the NIBIB grant). These results also provide for the first technical Profile confirmation. 3. Drs. Amaro and Nascimento led an RSNA R&E-funded study in São Paulo to test technical conformance of the Profile with phantom and in vivo imaging, assessing reproducibility across 18 clinical platforms for 480 subjects (though not test-retest). The technical assessment procedures were successfully implemented, and the brain protocol in the Profile found feasible (second technical Profile confirmation). Future study in H&N is being planned to include repeatability for clinical claim conformance testing in brain and provide test-retest data in H&N to complement pilot H&N repeatability study performed by MSKCC for development and addition of H&N Profile claim. UWash group (Gloria Guzmán Peréz-Carrillo) is interested in H&N study participation and optimization of acquisition protocol using phantoms and technical assessment procedures, which could streamline technical and clinical H&M claim confirmation. 4. Dan Margolis has joined the BC, bringing a strong connection to PI-RADS, and expressing interest by that committee to utilize the DWI Profile for improved use of ADC protocols for quantitative PCa assessment. He offered a link to PI-RADS committee to facilitate clinical claim confirmation in prostate and has also been a key participant in discussion with the VERDICT team, which itself has connections to individuals on the PI-RADS steering committee. 5. Drs. Malyarenko, Margolis and Shukla-Dave initiated a collaboration with UK VERDICT team (Dr. Punwani) to re-analyze their repeatability data for 40 prostate cancer subjects for b-range, zonal and ROI size dependence, to improve the prostate DWI Profile claim. Nancy Obuchowski has contributed statistical expertise as well. Prospective study is planned to include test-retest with ongoing clinical trial to achieve clinical claim confirmation in prostate. 6. Working on a white paper on the Profile, modeling off of Dr. Paul Kinahan's *Radiology* article on the FDG-PET Profile, referencing the Consensus (possibly Technically Confirmed) version of the Profile, and Dr. Amita Dave's *JMRI* paper.
MSK	Dr. Link	The MSK cartilage Profile was submitted for public comment on 06/26/2020. Major aspects of the Profile are based on a research study which was funded by the Arthritis Foundation and was published in parallel in July by *Osteoarthritis and Cartilage*, the leading journal in this field (*Osteoarthritis Cartilage*. 2020 Jul 30:S1063-4584(20)31085-2. doi: 10.1016/j.joca.2020.07.005. Online ahead of print). We are currently working on a white paper/technical report summarizing our Profile, which is intended for *Radiology*. Moreover, we started working on an NIH funded grant project entitled: "Multi-Vendor Multi-Site Novel Accelerated Quantitative Cartilage MRI," which will significantly move forward our QIBA related work and include development of a phantom by NIST.

US-CEUS	Dr. Averkiou	**Manuscript published**: Evaluation of the Reproducibility of Bolus Transit Quantification With Contrast-Enhanced Ultrasound Across Multiple Scanners and Analysis Software Packages—A Quantitative Imaging Biomarker Alliance Study. Averkiou, Michalakis A.; Juang, Eric K.; Gallagher, Madison K.; et.al. *Investigative Radiology*. 55(10):643-656, October 2020. **Summary findings were**: When using the protocol and method developed here, it is possible to perform perfusion quantification on different scanners and analysis software and be able to compare the results. abstract link posted to LinkedIn on 8/26
US-VBF	Dr. Kripfgans	**Manuscript published**: Oliver D. Kripfgans, Stephen Z. Pinter, Cristel Baiu, et.al. Three-dimensional US for Quantification of Volumetric Blood Flow: Multisite Multisystem Results from within the Quantitative Imaging Biomarkers Alliance. *Radiology* 2020 296:3, 662-670 Summary findings were: Volume flow estimated across flow, depth and stenosis tests was accurate (11.5% mean bias) and reproducible (10.5% reproducibility error) in this interlaboratory study. Paper has been selected for press-release with several interviews and was also selected as the front cover of the September issue of *Radiology*. posted to LinkedIn on 8/24
US-PEQUS	Dr. Wang	**New Committee**. Work groups for each of the three biomarkers in consideration have been created with the initial goal of reaching consensus on how to measure and report biomarkers and to draft claims of accuracy, precision, and reproducibility of the biomarkers under specified conditions. Currently they are proceeding with literature review of relevant PEQUS methods for inclusion in groundwork phantom study beginning next year. In parallel, a phantom work group has been created with the goal of defining specifications for the phantoms necessary to test the claims, and to carry out their procurement.