

Image-Guided Tumor Ablation: Standardization of Terminology and Reporting Criteria—A 10-Year Update

Muneeb Ahmed, MD, Luigi Solbiati, MD, Christopher L. Brace, PhD, David J. Breen, MD, Matthew R. Callstrom, MD, PhD, J. William Charboneau, MD, Min-Hua Chen, MD, Byung Ihn Choi, MD, Thierry de Baère, MD, Gerald D. Dodd, III, MD, Damian E. Dupuy, MD, Debra A. Gervais, MD, David Gianfelice, MD, Alice R. Gillams, MD, Fred T. Lee, Jr, MD, Edward Leen, FRCR, MD, Riccardo Lencioni, MD, Peter J. Littrup, MD, Tito Livraghi, MD, David S. Lu, MD, John P. McGahan, MD, Maria Franca Meloni, MD, Boris Nikolic, MD, Philippe L. Pereira, MD, Ping Liang, MD, Hyunchul Rhim, MD, Steven C. Rose, MD, Riad Salem, MD, MBA, Constantinos T. Sofocleous, MD, Stephen B. Solomon, MD, Michael C. Soulen, MD, Masatoshi Tanaka, MD, Thomas J. Vogl, MD, Bradford J. Wood, MD, and S. Nahum Goldberg, MD, for the International Working Group on Image-Guided Tumor Ablation, Interventional Oncology Sans Frontières Expert Panel, Technology Assessment Committee of the Society of Interventional Radiology, and the Standard of Practice Committee of the Cardiovascular and Interventional Radiological Society of Europe

From the Department of Radiology, Beth Israel Deaconess Medical Center 1 Deaconess Rd, WCC-308B, Boston, MA 02215 (M.A.); Department of Radiology, Ospedale Generale, Busto Arsizio, Italy (L.S.); Departments of Radiology, Biomedical Engineering, and Medical Physics, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin (C.L.B.); Department of Radiology, Southampton University Hospitals, Southampton, England (D.J.B.); Department of Radiology, Mayo Clinic, Rochester, Minnesota (M.R.C., J.W.C.); Department of Ultrasound, School of Oncology, Peking University, Beijing, China (M.H.C.); Department of Radiology, Seoul National University Hospital, Seoul, Republic of Korea (B.I.C.); Department of Imaging, Institut de Cancérologie Gustave Roussy, Villejuif, France (T.d.B.); Department of Radiology, School of Medicine, University of Colorado Anschutz Medical Campus, Aurora, Colorado (G.D.D.); Department of Diagnostic Radiology, Rhode Island Hospital, Providence, Rhode Island (D.E.D.); Department of Radiology, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts (D.A.G.); Medical Imaging, University Health Network, Laval, Quebec, Canada (D.G.); Imaging Department, the London Clinic, London, England (A.R.G.); Department of Radiology, University of Wisconsin Hospital and Clinics, Madison, Wisconsin (F.T.L.); Department of Radiology, Royal Infirmary, Glasgow, Scotland (E.L.); Department of Diagnostic Imaging and Intervention, Cisanello Hospital, Pisa University Hospital and School of Medicine, University of Pisa, Pisa, Italy (R.L.); Department of Radiology, Karmonos Cancer Institute, Wayne State University, Detroit, Michigan (P.J.L.); Busto Arsizio, Italy (T.L.); Department of Radiology, David Geffen School of Medicine at UCLA, Los Angeles, California (D.S.L.); Department of Radiology, Ambulatory Care Center, UC Davis Medical Center, Sacramento, California (J.P.M.); Department of Radiology, Ospedale Valduce, Como, Italy (M.F.M.); Department of Radiology, Albert Einstein Medical Center, Philadelphia, Pennsylvania (B.N.); Clinic of Radiology, Minimally-Invasive Therapies and Nuclear Medicine, Academic Hospital Ruprecht-Karls-University Heidelberg, Heilbronn, Germany (P.L.P.); Department of Interventional Ultrasound, Chinese PLA General Hospital, Beijing, China (P.L.); Department of Diagnostic Radiology, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, Republic of Korea (H.R.); Department of Radiology, University of California, San Diego, San Diego, California (S.C.R.); Department of Radiology, Northwestern University, Chicago, Illinois (R.S.); Department of Radiology, Memorial Sloan Kettering Cancer Center, New York, New York (C.T.S., S.B.S.); Department of Radiology, Hospital of the University of Pennsylvania, Philadelphia, Pennsylvania (M.C.S.); Department of Hepatology, Yokokura Hospital, Miyama, Japan (M.T.); Institute for Diagnostic and Interventional Radiology, University Hospital Frankfurt, Johann Wolfgang Goethe-University, Frankfurt, Germany (T.J.V.); Radiology and Imaging Science, National Institutes of Health, Bethesda,

Maryland (B.J.W.); and Department of Radiology, Image-Guided Therapy and Interventional Oncology Unit, Hadassah Hebrew University Medical Center, Jerusalem, Israel (S.N.G.). Received December 28, 2013; revision requested; February 11, 2014; final revision received February 24 2014; accepted March 26, 2014. Address correspondence to M.A.; E-mail: mahmed@bidmc.harvard.edu

Guarantors of integrity of entire study, M.A., L.S., S.N.G.; study concepts/ study design or data acquisition or data analysis/interpretation, all authors; manuscript drafting or manuscript revision for important intellectual content, all authors; approval of final version of submitted manuscript, all authors; literature research, M.A., L.S., D.J.B., T.d.B., D.A.G., D.G., T.L., D.S.L., P.L.P., C.T.S., M.T., B.J.W., S.N.G.; clinical studies, D.J.B., M.H.C., D.G., T.L., M.F.M., P.L., R.S., M.T.; statistical analysis, T.L.; and manuscript editing, M.A., L.S., C.L.B., D.J.B., M.R.C., J.W.C., M.H.C., B.I.C., T.d.B., G.D.D., D.E.D., D.A.G., D.G., A.R.G., F.T.L., E.L., P.J.L., T.L., D.S.L., M.F.M., B.N., P.L.P., H.R., S.C.R., R.S., C.T.S., S.B.S., M.C.S., M.T., T.J.V., B.J.W., S.N.G.

B.J.W. is an employee of the National Institutes of Health.

M.A. No relevant conflicts of interest to disclose. **L.S.** No relevant conflicts of interest to disclose. **C.L.B.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: received consultancy fees from NeuWave Medical, author and institution received payment for patents (planned, pending, or issued) from University of Wisconsin and NeuWave Medical, received payment for stock/stock options from NeuWave Medical. Other relationships: none to disclose. **D.J.B.** Financial activities related to the present article: paid for occasional proctoring by Galil Medical. Financial activities not related to the present article: none to disclose. Other relationships: none to disclose. **M.R.C.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: received grants from Galil Medical, Siemens Medical, GE Medical, Thermedical. Other relationships: none to disclose. **J.W.C.** No relevant conflicts of interest to disclose. **M.H.C.** No relevant conflicts of interest to disclose. **B.I.C.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: institution received a research grant from Samsung Electronics. Other relationships: none to disclose. **T.d.B.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: received personal fees from Terumo, a grant from HS-Medical, and payment for travel to a meeting from Boston-Scientific. Other relationships: none to disclose. **G.D.D.** No relevant conflicts of interest to disclose. **D.E.D.** Financial activities related to the present article: none to

ABSTRACT

Image-guided tumor ablation has become a well-established hallmark of local cancer therapy. The breadth of options available in this growing field increases the need for standardization of terminology and reporting criteria to facilitate effective communication of ideas and appropriate comparison among treatments that use different technologies, such as chemical (eg, ethanol or acetic acid) ablation, thermal therapies (eg, radiofrequency, laser, microwave, focused ultrasound, and cryoablation) and newer ablative modalities such as irreversible electroporation. This updated consensus document provides a framework that will facilitate the clearest communication among investigators regarding ablative technologies. An appropriate vehicle is proposed for reporting the various aspects of image-guided ablation therapy including classification of therapies, procedure terms, descriptors of imaging guidance, and terminology for imaging and pathologic findings. Methods are addressed for standardizing reporting of technique, follow-up, complications, and clinical results. As noted in the original document from 2003, adherence to the recommendations will improve the precision of communications in this field, leading to more accurate comparison of technologies and results, and ultimately to improved patient outcomes.

ABBREVIATIONS

IRE = irreversible electroporation, OS = overall survival, PFS = progression-free survival, RF = radiofrequency, SIR = Society of Interventional Radiology, TTP = time to tumor progression

In 2003, the International Working Group on Image-Guided Tumor Ablation published a document titled “Image-Guided Tumor Ablation: Proposal for Standardization of Terms and Reporting Criteria” (1). At the time, image-guided tumor ablation, and indeed, the subspecialty of interventional oncology, was in its infancy. Nevertheless, it was acknowledged by the members of the Working Group that the new field of image-guided tumor ablation required standardization of terminology and reporting criteria to facilitate effective communication

of ideas and appropriate comparison among different technologies. The main objective of the document was “improved precision and communication in this field that leads to more accurate comparison of technologies and results and ultimately to improved patient outcomes” (1). Originally published in 2003 in *Radiology*, the document was subsequently reviewed at regular intervals in conjunction with the Society of Interventional Radiology (SIR) Technology Assessment Committee and republished in near original form in 2005 and 2009.

(footnote continued)

disclose. Financial activities not related to the present article: paid for board membership by BSD Medical, received consultancy fees from BSD Medical and Covidien, received grants or has grants pending from NeuWave Medical, received payment for lectures including service on speakers bureaus from BSD Medical, was paid royalties by Springer Verlag and UpToDate, received stock or stock options from BSD Medical. Other relationships: none to disclose. **D.A.G.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: received a research grant from Covidien/Valleylab. Other relationships: none to disclose. **D.G.** No relevant conflicts of interest to disclose. **A.R.G.** Financial activities related to the present article: received consulting fee or honorarium from Covidien, received fees for participant in review activities such as data monitoring boards, statistical analysis, end point committees, and the like from Covidien. Financial activities not related to the present article: was paid for board membership, consultancy, and lectures including service on speakers bureaus by Covidien. Other relationships: none to disclose. **F.T.L.** Financial activities related to the present article: received payment from NeuWave Medical. Financial activities not related to the present article: received royalties from Covidien, is a stockholder and on the Board of Directors for NeuWave Medical, has a patent on the Switching Controller with royalties paid from Covidien, has multiple patents on heat-based thermal therapies for microwave ablation systems licensed to NeuWave Medical. Other relationships: none to disclose. **E.L.** No relevant conflicts of interest to disclose. **R.L.** No relevant conflicts of interest to disclose. **P.J.L.** No relevant conflicts of interest to disclose. **T.L.** No relevant conflicts of interest to disclose. **D.S.L.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: institution received grants or has grants pending from Endocare and Ethicon Endo-Surgery, received payment for lectures including service on speakers bureaus from Philips. Other relationships: none to disclose. **J.P.M.** No relevant conflicts of interest to disclose. **M.F.M.** No relevant conflicts of interest to disclose. **B.N.** No relevant conflicts of interest to disclose. **P.L.P.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: received a grant from Celon Olympus; fees for conferences from Siemens Medical Solutions; consultant's honoraries from Terumo Europe, Terumo Germany, and Microsulis;

materials from AngioDynamics. Other relationships: none to disclose. **P.L.** No relevant conflicts of interest to disclose. **H.R.** No relevant conflicts of interest to disclose. **S.C.R.** No relevant conflicts of interest to disclose. **R.S.** No relevant conflicts of interest to disclose. **C.T.S.** No relevant conflicts of interest to disclose. **S.B.S.** Financial activities related to the present article: institution received a grant from GE Healthcare; author received consulting fee or honorarium from AngioDynamics, Covidien, and GE Healthcare. Financial activities not related to the present article: none to disclose. Other relationships: none to disclose. **M.C.S.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: author received consultancy fees from Guerbet LLC, BTG, Merit Medical; institution received grants or has grants pending from Guerbet LLC and BTG; author received payment for lectures including service on speakers bureaus from Sirtex; author received royalties from Cambridge University Press. Other relationships: none to disclose. **M.T.** No relevant conflicts of interest to disclose. **T.J.V.** No relevant conflicts of interest to disclose. **B.J.W.** Financial activities related to the present article: none to disclose. Financial activities not related to the present article: institution received grants or has grants pending from Cooperative Research and Development Agreement (CRADA) Philips Healthcare, CRADA Biocompatibles BTG, CRADA Perfint, CRADA Celsion, CRADA Invivo; the National Institutes of Health has intellectual property in the field. Other relationships: none to disclose. **S.N.G.** Financial activities related to the present article: institution received a grant for sponsored research from AngioDynamics; author received consulting fee or honorarium from AngioDynamics. Financial activities not related to the present article: author received consultancy fees from Cosman Medical and institution received grants or has grants pending from Cosman Medical. Other relationships: none to disclose.

Appendix E1 is available online at www.jvir.org.

© RSNA, 2014. This article Published in *Radiology* 2014; 273:241–260. <http://dx.doi.org/10.1148/radiol.14132958>. Reprinted with permission.

J Vasc Interv Radiol 2014; 25:1691–1705

<http://dx.doi.org/10.1016/j.jvir.2014.08.027>

Download English Version:

<https://daneshyari.com/en/article/6245833>

Download Persian Version:

<https://daneshyari.com/article/6245833>

[Daneshyari.com](https://daneshyari.com)