BIOGRAPHICAL SKETCH

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NAME: Carr, John Jeffrey

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POSITION TITLE: Cornelius Vanderbilt Professor in Radiological Sciences, Cardiovascular Medicine and Biomedical Informatics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	END DATE MM/YYYY	FIELD OF STUDY
Vanderbilt University, Nashville, TN	AB	05/1985	Biology
Vanderbilt University, Nashville, TN	MD	05/1989	Medicine
American Board of Radiology	OTH	06/1993	Board Certification: Diagnostic Radiology
Wake Forest University, Winston-Salem, NC	MS	05/1998	Epidemiology
Wake Forest Baptist Medical Center, Winston-Salem, NC	Resident	06/1993	Diagnostic Radiology
Hospital of the University of Pennsylvania, Philadelphia, PA	Fellow	08/1994	Body&CV MRI

A. Personal Statement

I am a clinician-scientist developing imaging biomarkers and methods to aid in diagnosis and prevention of disease. Clinically, I am a cardiovascular radiologist with training epidemiology and population science. I provide multi-specialty care and education as part of the structural heart and adult congenital heart programs at VUMC. Research projects include CT measure of coronary plaque, non-invasive measured of coronary and aortic flow, vascular stiffness, cardiac function, body composition and imaging applications of deep learning/artificial intelligence. Relevant to this training proposal, I am a long-standing investigator in NHLBI supported NHLBI supported cohort studies including MESA, Jackson Heart Study, WHI, C4R and CARDIA. In addition to research activities to address disparities in cardiovascular disease care and prevention, I have provided mentorship to range of trainees and junior faculty from diverse backgrounds. I look forward to contributing to helping develop the next generation of clinician scientists!

1. Messier SP, Mihalko SL, Beavers DP, Nicklas BJ, DeVita P, Carr JJ, Hunter DJ, Lyles M, Guermazi A, Bennell KL, Loeser RF. Effect of High-Intensity Strength Training on Knee Pain and Knee Joint Compressive Forces Among Adults With Knee Osteoarthritis: The START Randomized Clinical Trial. JAMA. 2021 Feb 16;325(7):646-657. PubMed Central PMCID: PMC7887656.

2. Kahali B, Chen Y, Feitosa MF, Bielak LF, O'Connell JR, Musani SK, Hegde Y, Chen Y, Stetson LC, Guo X, Fu YP, Smith AV, Ryan KA, Eiriksdottir G, Cohain AT, Allison M, Bakshi A, Bowden DW, Budoff MJ, Carr JJ, Carskadon S, Chen YI, Correa A, Crudup BF, Du X, Harris TB, Yang J, Kardia SLR, Launer LJ, Liu J, Mosley TH, Norris JM, Terry JG, Palanisamy N, Schadt EE, O'Donnell CJ, Yerges-Armstrong LM, Rotter JI, Wagenknecht LE, Handelman SK, Gudnason V, Province MA, Peyser PA, Halligan B, Palmer ND, Speliotes EK. A Noncoding Variant Near PPP1R3B Promotes Liver Glycogen Storage and MetS, but Protects Against Myocardial Infarction. J Clin Endocrinol Metab. 2021 Jan 23;106(2):372-387. PubMed Central PMCID: PMC7823249.

3. van Velzen SGM, Lessmann N, Velthuis BK, Bank IEM, van den Bongard DHJG, Leiner T, de Jong PA, Veldhuis WB, Correa A, Terry JG, Carr JJ, Viergever MA, Verkooijen HM, Išgum I. Deep Learning for Automatic Calcium Scoring in CT: Validation Using Multiple Cardiac CT and Chest CT Protocols. Radiology. 2020 Apr;295(1):66-79. PubMed Central PMCID: PMC7106943.

4. Carr JJ, Jacobs DR Jr, Terry JG, Shay CM, Sidney S, Liu K, Schreiner PJ, Lewis CE, Shikany JM, Reis JP, Goff DC Jr. Association of Coronary Artery Calcium in Adults Aged 32 to 46 Years With Incident Coronary Heart Disease and Death. JAMA Cardiol. 2017 Apr 1;2(4):391-399. PubMed Central PMCID: PMC5397328.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2015 - 2020	Vice Chair Imaging Informatics, Vanderbilt Univ Medical Center, Nashville, TN
2013 -	Cornelius Vanderbilt Professor in Radiological Sciences, Cardiovascular Medicine and Biomedical Informatics, Vanderbilt University Medical Center, Nashville, TN
2009 - 2012	Director, Center for Biomedical Informatics, Wake Forest University Health Science, Translational Science Institute, Winston Salem, NC
2008 - 2013	Affiliate, Maya Angelou Center for Health Equity, Wake Forest University Health Science, Winston Salem, NC
2006 - 2013	Professor of Radiology, Cardiology and Public Health, Wake Forest Univ. Health Science, Winston Salem, NC
2004 - 2010	Vice Chair Clinical Research, Radiology, Wake Forest University Health Science, Winston Salem, NC
2001 - 2006	Associate Prof. of Radiology and Public Health Sciences, Wake Forest Univ. Health Sciences, Winston Salem, NC
1994 - 2001	Assistant Professor of Radiology, Wake Forest University Health Sciences, Winston Salem, NC
1993 - 1994	Instructor in Radiology, University of Pennsylvania School of Medicine, Philadelphia, PA
1985 - 1987	Research Assistant - PI: Lynda J. Van Eldik, PhD, Howard Hughes Medical Institute (Vanderbilt), Nashville, TN

Honors

2015	Distinguished Investigator Award, Academy of Radiology Research
1991	Gold Medal Award , 91st Annual Meeting American Roentgen Ray Society
1989	Dean's Award, Vanderbilt School of Medicine
1985	BA, Magnum Cum Laude, Vanderbilt University

C. Contribution to Science

1. Current generation medical CT scanners, now described as multi-detector CT, can provide precise in vivo measures of human coronary anatomy, pathology and hemodynamics including plaque volume, peri-coronary adipose tissue, stenosis, coronary fractional flow reserve and coronary artery calcium(CAC). Initially, electron beam CT (EBCT) was the only technology that could image the coronary arteries with <50 systems in U.S. Starting in 1998, I helped develop and clinically validate multi-detector CT for coronary imaging and measuring CAC. CAC score is now established as the strongest independent biomarker for coronary heart disease and is included in the current U.S. ACC/AHA guidelines for cholesterol management and CVD prevention. I played a significant role in teams that have used CAC to understand the environmental and genetic risk for CVD in understudied populations including the Women's Health Initiative, MESA, CARDIA, Jackson Heart Study, Diabetes Heart Study, Family Heart Study, South Asians in the US (MASALA) and a study of African ancestry men on the island of Tobago. In the CARDIA cohort we demonstrated that CAC is highly predictive of clinical coronary heart disease and death in adults prior to age 60 years irrespective of self-reported gender or biracial category despite the low calcium scores common in young adults.

   a. Carr JJ, Jacobs DR Jr, Terry JG, Shay CM, Sidney S, Liu K, Schreiner PJ, Lewis CE, Shikany JM, Reis JP, Goff DC Jr. Association of Coronary Artery Calcium in Adults Aged 32 to 46 Years With Incident Coronary Heart Disease and Death. JAMA Cardiol. 2017 Apr 1;2(4):391-399. PubMed Central PMCID: PMC5397328.

b. Detrano R, Guerci AD, Carr JJ, Bild DE, Burke G, Folsom AR, Liu K, Shea S, Szklo M, Bluemke DA, O'Leary DH, Tracy R, Watson K, Wong ND, Kronmal RA. Coronary calcium as a predictor of coronary events in four racial or ethnic groups. N Engl J Med. 2008 Mar 27;358(13):1336-45. PubMed PMID: 18367736.

c. Manson JE, Allison MA, Rossouw JE, Carr JJ, Langer RD, Hsia J, Kuller LH, Cochrane BB, Hunt JR, Ludlam SE, Pettinger MB, Gass M, Margolis KL, Nathan L, Ockene JK, Prentice RL, Robbins J, Stefanick ML. Estrogen therapy and coronary-artery calcification. N Engl J Med. 2007 Jun 21;356(25):2591-602. PubMed PMID: 17582069.

d. Carr JJ, Nelson JC, Wong ND, McNitt-Gray M, Arad Y, Jacobs DR Jr, Sidney S, Bild DE, Williams OD, Detrano RC. Calcified coronary artery plaque measurement with cardiac CT in population-based studies: standardized protocol of Multi-Ethnic Study of Atherosclerosis (MESA) and Coronary Artery Risk Development in Young Adults (CARDIA) study. Radiology. 2005 Jan;234(1):35-43. PubMed PMID: 15618373.

2. An individual's health status is dependent upon the interaction between all the organs and tissues of the body. The risk of developing clinical disease increases as the burden of subclinical disease increases. Imaging methods to measure the heart, vasculature, lungs, liver, muscles and adipose tissue in a quantifiable and reproducible way have allowed greater understanding of the complex relations between multiple tissues and to develop new approaches.

a. Moore EE, Liu D, Li J, Schimmel SJ, Cambronero FE, Terry JG, Nair S, Pechman KR, Moore ME, Bell SP, Beckman JA, Gifford KA, Hohman TJ, Blennow K, Zetterberg H, Carr JJ, Jefferson AL. Association of Aortic Stiffness With Biomarkers of Neuroinflammation, Synaptic Dysfunction, and Neurodegeneration. Neurology. 2021 Jul 27;97(4):e329-e340. PubMed Central PMCID: PMC8362359.

b. Messier SP, Mihalko SL, Beavers DP, Nicklas BJ, DeVita P, Carr JJ, Hunter DJ, Lyles M, Guermazi A, Bennell KL, Loeser RF. Effect of High-Intensity Strength Training on Knee Pain and Knee Joint Compressive Forces Among Adults With Knee Osteoarthritis: The START Randomized Clinical Trial. JAMA. 2021 Feb 16;325(7):646-657. PubMed Central PMCID: PMC7887656.

c. Barr RG, Bluemke DA, Ahmed FS, Carr JJ, Enright PL, Hoffman EA, Jiang R, Kawut SM, Kronmal RA, Lima JA, Shahar E, Smith LJ, Watson KE. Percent emphysema, airflow obstruction, and impaired left ventricular filling. N Engl J Med. 2010 Jan 21;362(3):217-27. PubMed Central PMCID: PMC2887729.

d. Ding J, Hsu FC, Harris TB, Liu Y, Kritchevsky SB, Szklo M, Ouyang P, Espeland MA, Lohman KK, Criqui MH, Allison M, Bluemke DA, Carr JJ. The association of pericardial fat with incident coronary heart disease: the Multi-Ethnic Study of Atherosclerosis (MESA). Am J Clin Nutr. 2009 Sep;90(3):499-504. PubMed Central PMCID: PMC2728641.

3. Developing new imaging biomarkers and enhanced techniques to measure biologic and pathologic process is essential to new discoveries. Translating technologic advances into data that can used for research and discovery and if appropriate clinical care is translational research that is critical to preventing and treating many of the chronic disease conditions.

a. Spahillari A, Zhu J, Ferket BS, Hunink MGM, Carr JJ, Terry JG, Nelson C, Mwasongwe S, Mentz RJ, O'Brien EC, Correa A, Shah RV, Murthy VL, Pandya A. Cost-effectiveness of Contemporary Statin Use Guidelines With or Without Coronary Artery Calcium Assessment in African American Individuals. JAMA Cardiol. 2020 Aug 1;5(8):871-880. PubMed Central PMCID: PMC7221863.

b. Terry JG, Hartley KG, Steffen LM, Nair S, Alman AC, Wellons MF, Jacobs DR Jr, Tindle HA, Carr JJ. Association of smoking with abdominal adipose deposition and muscle composition in Coronary Artery Risk Development in Young Adults (CARDIA) participants at mid-life: A population-based cohort study. PLoS Med. 2020 Jul;17(7):e1003223. PubMed Central PMCID: PMC7373261.

c. van Velzen SGM, Lessmann N, Velthuis BK, Bank IEM, van den Bongard DHJG, Leiner T, de Jong PA, Veldhuis WB, Correa A, Terry JG, Carr JJ, Viergever MA, Verkooijen HM, Išgum I. Deep Learning for Automatic Calcium Scoring in CT: Validation Using Multiple Cardiac CT and Chest CT Protocols. Radiology. 2020 Apr;295(1):66-79. PubMed Central PMCID: PMC7106943.

d. Huo Y, Terry JG, Wang J, Nair S, Lasko TA, Freedman BI, Carr JJ, Landman BA. Fully automatic liver attenuation estimation combing CNN segmentation and morphological operations. Med Phys. 2019 Aug;46(8):3508-3519. PubMed Central PMCID: PMC6692233.