

Online Data Supplement

Frailty and Clinical Outcomes in Chronic Obstructive Pulmonary Disease

Cassie C. Kennedy M.D., Paul J. Novotny M.S., Nathan K. LeBrasseur Ph.D., Robert A. Wise M.D., Frank C. Sciruba M.D., Roberto P. Benzo M.D. and the NETT Research Group

Members of the NETT Research Group are as follows:

Office of the Chair of the Steering Committee, University of Pennsylvania, Philadelphia, PA: Alfred P. Fishman, MD (Chair); Betsy Ann Bozzarello; Ameena Al-Amin. Clinical centers: Baylor College of Medicine, Houston, TX: Marcia Katz, MD (Principal Investigator); Carolyn Wheeler, RN, BSN (Principal Clinic Coordinator); Elaine Baker, RRT, RPFT; Peter Barnard, PhD, RPFT; Phil Cagle, MD; James Carter, MD; Sophia Chatziioannou, MD; Karla Conejo-Gonzales; Kimberly Dubose, RRT; John Haddad, MD; David Hicks, RRT, RPFT; Neal Kleiman, MD; Mary Milburn-Barnes, CRTT; Chinh Nguyen, RPFT; Michael Reardon, MD; Joseph Reeves-Viets, MD; Steven Sax, MD; Amir Sharafkhaneh, MD; Owen Wilson, PhD; Christine Young PT; Rafael Espada, MD (Principal Investigator 1996–2002); Rose Butanda (1999–2001); Minnie Ellisor (2002); Pamela Fox, MD (1999–2001); Katherine Hale, MD (1998–2000); Everett Hood, RPFT (1998–2000); Amy Jahn (1998–2000); Satish Jhingran, MD (1998–2001); Karen King, RPFT (1998–1999); Charles Miller III, PhD (1996–1999); Imran Nizami, MD (Co-Principal Investigator, 2000–2001); Todd Officer (1998–2000); Jeannie Ricketts (1998–2000); Joe Rodarte, MD (Co-Principal Investigator 1996–2000); Robert Teague, MD (Co-Principal Investigator 1999–2000); Kedren Williams (1998–1999). Brigham and Women’s Hospital, Boston, MA: John Reilly, MD (Principal Investigator); David Sugarbaker, MD (Co-Principal Investigator); Carol Fanning, RRT (Principal Clinic Coordinator); Simon Body, MD; Sabine Duffy, MD; Vladmir Formanek, MD; Anne Fuhlbrigge, MD; Philip Hartigan, MD; Sarah Hooper, EP; Andetta Hunsaker, MD; Francine Jacobson, MD; Marilyn Moy, MD; Susan Peterson, RRT; Roger Russell, MD; Diane Saunders; Scott Swanson, MD (Co-Principal Investigator, 1996–2001). Cedars-Sinai Medical Center, Los Angeles, CA: Rob McKenna, MD (Principal Investigator); Zab Mohsenifar, MD (Co-Principal Investigator); Carol Geaga, RN (Principal Clinic Coordinator); Manmohan Biring, MD; Susan Clark, RN, MN; Jennifer Cutler, MD; Robert Frantz, MD; Peter Julien, MD; Michael Lewis, MD; Jennifer Minkoff-Rau, MSW; Valentina Yegyan, BS, CPFT; Milton Joyner, BA (1996–2002). Cleveland Clinic Foundation, Cleveland, OH: Malcolm DeCamp, MD (Principal Investigator); James Stoller, MD (Co-Principal Investigator); Yvonne Meli, RN, C (Principal Clinic Coordinator); John Apostolakis, MD; Darryl Atwell, MD; Jeffrey Chapman, MD; Pierre DeVilliers, MD; Raed Dweik, MD; Erik Kraenzler, MD; Rosemary Lann, LISW; Nancy Kurokawa, RRT, CPFT; Scott Marlow, RRT; Kevin McCarthy, RCPT; Priscilla McCreight, RRT, CPFT; Atul Mehta, MD; Moulay Meziane, MD; Omar Minai, MD; Mindi Steiger, RRT; Kenneth White, RPFT; Janet Maurer, MD (Principal Investigator, 1996–2001); Terri Durr, RN (2000–2001); Charles Hearn, DO (1998–2001); Susan Lubell, PA-C (1999–2000); Peter O’Donovan, MD (1998–2003); Robert Schilz, DO (1998–2002). Columbia University, New York, NY in consortium with Long Island Jewish Medical Center, New Hyde Park, NY: Mark Ginsburg, MD (Principal Investigator); Byron Thomashow, MD (Co-Principal Investigator); Patricia Jellen,

MSN, RN (Principal Clinic Coordinator); John Austin, MD; Matthew Bartels, MD; Yahya Berkmen, MD; Patricia Berkoski, MS, RRT (Site coordinator, LIJ); Frances Brogan, MSN, RN; Amy Chong, BS, CRT; Glenda DeMercado, BSN; Angela DiMango, MD; Sandy Do, MS, PT; Bessie Kachulis, MD; Arfa Khan, MD; Berend Mets, MD; Mitchell O'Shea, BS, RT, CPFT; Gregory Pearson, MD; Leonard Rossoff, MD; Steven Scharf, MD, PhD (Co-Principal Investigator, 1998–2002); Maria Shiau, MD; Paul Simonelli, MD; Kim Stavrolakes, MS, PT; Donna Tsang, BS; Denise Vilotijevic, MS, PT; Chun Yip, MD; Mike Mantinaos, MD (1998–2001); KerriMcKeon, BS, RRT, RN (1998–1999); Jacqueline Pfeffer, MPH, PT (1997–2002). Duke University Medical Center, Durham, NC: Neil MacIntyre, MD (Principal Investigator); R. Duane Davis, MD (Co-Principal Investigator); John Howe, RN (Principal Clinic Coordinator); R. Edward Coleman, MD; Rebecca Crouch, RPT; Dora Greene; Katherine Grichnik, MD; David Harpole, Jr., MD; Abby Krichman, RRT; Brian Lawlor, RRT; Holman McAdams, MD; John Plankeel, MD; Susan Rinaldo-Gallo, MED; Sheila Shearer, RRT; Jeanne Smith, ACSW; Mark Stafford-Smith, MD; Victor Tapson, MD; Mark Steele, MD (1998–1999); Jennifer Norten, MD (1998–1999). Mayo Foundation, Rochester, MN: James Utz, MD (Principal Investigator); Claude Deschamps, MD (Co-Principal Investigator); Kathy Mieras, CCRP (Principal Clinic Coordinator); Martin Abel, MD; Mark Allen, MD; Deb Andrist, RN; Gregory Aughenbaugh, MD; Sharon Bendel, RN; Eric Edell, MD; Marlene Edgar; Bonnie Edwards; Beth Elliot, MD; James Garrett, RRT; Delmar Gillespie, MD; Judd Gurney, MD; Boleyn Hammel; Karen Hanson, RRT; Lori Benzo, Farrell, Chang, et al.: Integrating Health Status with Survival 245 Hanson, RRT; Gordon Harms, MD; June Hart; Thomas Hartman, MD; Robert Hyatt, MD; Eric Jensen, MD; Nicole Jenson, RRT; Sanjay Kalra, MD; Philip Karsell, MD; Jennifer Lamb; David Midthun, MD; Carl Mottram, RRT; Stephen Swensen, MD; Anne-Marie Sykes, MD; Karen Taylor; Norman Torres, MD; Rolf Hubmayr, MD (1998–2000); Daniel Miller, MD (1999–2002); Sara Bartling, RN (1998–2000); Kris Bradt (1998–2002). National Jewish Medical and Research Center, Denver, CO: Barry Make, MD (Principal Investigator); Marvin Pomerantz, MD (Co-Principal Investigator); Mary Gilmartin, RN, RRT (Principal Clinic Coordinator); Joyce Canterbury; Martin Carlos; Phyllis Dibbern, PT; Enrique Fernandez, MD; Lisa Geyman, MSPT; Connie Hudson; David Lynch, MD; John Newell, MD; Robert Quaife, MD; Jennifer Propst, RN; Cynthia Raymond, MS; Jane Whalen-Price, PT; Kathy Winner, OTR; Martin Zamora, MD; Reuben Cherniack, MD (Principal Investigator, 1997–2000). Ohio State University, Columbus, OH: Philip Diaz, MD (Principal Investigator); Patrick Ross, MD (Co-Principal Investigator); Tina Bees (Principal Clinic Coordinator); Jan Drake; Charles Emery, PhD; Mark Gerhardt, MD, PhD; Mark King, MD; David Rittinger; Mahasti Rittinger. Saint Louis University, Saint Louis, MO: Keith Naunheim, MD (Principal Investigator); Robert Gerber, MD (Co-Principal Investigator); Joan Osterloh, RN, MSN (Principal Clinic Coordinator); Susan Borosh; Willard Chamberlain, DO; Sally Frese; Alan Hibbit; Mary Ellen Kleinhenz, MD; Gregg Ruppel; Cary Stolar, MD; Janice Willey; Francisco Alvarez, MD (Co-Principal Investigator, 1999–2002); Cesar Keller, MD (Co-Principal Investigator, 1996–2000). Temple University, Philadelphia, PA: Gerard Criner, MD (Principal Investigator); Satoshi Furukawa, MD (Co-Principal Investigator); Anne Marie Kuzma, RN, MSN (Principal Clinic Coordinator); Roger Barnette, MD; Neil Brister, MD; Kevin Carney, RN, CCTC; Wissam Chatila, MD; Francis Cordova, MD; Gilbert D'Alonzo, DO; Michael Keresztury, MD; Karen Kirsch; Chul Kwak, MD; Kathy Lautensack, RN, BSN; Madelina Lorenzon, CPFT; Ubaldo Martin, MD; Peter Rising, MS; Scott Schartel, MD; John Travaline, MD; Gwendolyn Vance, RN, CCTC; Phillip Boiselle, MD (1997–2000); Gerald O'Brien, MD (1997–2000). University of California, San Diego,

San Diego, CA: Andrew Ries, MD, MPH (Principal Investigator); Robert Kaplan, PhD (Co-Principal Investigator); Catherine Ramirez, BS, RCP (Principal Clinic Coordinator); David Frankville, MD; Paul Friedman, MD; James Harrell, MD; Jeffery Johnson; David Kapelanski, MD; David Kupferberg, MD, MPH; Catherine Larsen, MPH; Trina Limberg, RRT; Michael Magliocca, RN, CNP; Frank J. Papatheofanis, MD, PhD; Dawn Sassi-Damborn, RN; Melissa Weeks. University of Maryland at Baltimore, Baltimore, MD in consortium with Johns Hopkins Hospital, Baltimore, MD: Mark Krasna, MD (Principal Investigator); Henry Fessler, MD (Co-Principal Investigator); Iris Moskowitz (Principal Clinic Coordinator); Timothy Gilbert, MD; Jonathan Orens, MD; Steven Scharf, MD, PhD; David Shade; Stanley Siegelman, MD; Kenneth Silver, MD; Clarence Weir; Charles White, MD. University of Michigan, Ann Arbor, MI: Fernando Martinez, MD (Principal Investigator); Mark Iannettoni, MD (Co-Principal Investigator); Catherine Meldrum, BSN, RN, CCRN (Principal Clinic Coordinator); William Bria, MD; Kelly Campbell; Paul Christensen, MD; Kevin Flaherty, MD; Steven Gay, MD; Paramjit Gill, RN; Paul Kazanjian, MD; Ella Kazerooni, MD; Vivian Knieper; Tammy Ojo, MD; Lewis Poole; Leslie Quint, MD; Paul Rysso; Thomas Sisson, MD; Mercedes True; Brian Woodcock, MD; Lori Zaremba, RN. University of Pennsylvania, Philadelphia, PA: Larry Kaiser, MD (Principal Investigator); John Hansen-Flaschen, MD (Co-Principal Investigator); Mary Louise Dempsey, BSN, RN (Principal Clinic Coordinator); Abass Alavi, MD; Theresa Alcorn, Selim Arcasoy, MD; Judith Aronchick, MD; Stanley Aukberg, MD; Bryan Benedict, RRT; Susan Craemer, BS, RRT, CPFT; Ron Daniele, MD; Jeffrey Edelman, MD; Warren Gefter, MD; Laura Kotler-Klein, MSS; Robert Kotloff, MD; David Lipson, MD; Wallace Miller, Jr., MD; Richard O'Connell, RPFT; Staci Oelman, MSW; Harold Palevsky, MD; William Russell, RPFT; Heather Sheaffer, MSW; Rodney Simcox, BSRT, RRT; Susanne Snedeker, RRT, CPFT; Jennifer Stone-Wynne, MSW; Gregory Tino, MD; Peter Wahl; James Walter, RPFT; Patricia Ward; David Zisman, MD; James Mendez, MSN, CRNP (1997–2001); Angela Wurster, MSN, CRNP (1997–1999). University of Pittsburgh, Pittsburgh, PA: Frank Sciorba, MD (Principal Investigator); James Luketich, MD (Co-Principal Investigator); Colleen Witt, MS (Principal Clinic Coordinator); Gerald Ayres; Michael Donahoe, MD; Carl Fuhrman, MD; Robert Hoffman, MD; Joan Lacomis, MD; Joan Sexton; William Slivka; Diane Strollo, MD; Erin Sullivan, MD; Tomeka Simon; Catherine Wrona, RN, BSN; Gerene Bauldoff, RN, MSN (1997–2000); Manuel Brown, MD (1997–2002); Elisabeth George, RN, MSN (Principal Clinic Coordinator 1997–2001); Robert Keenan, MD (Co-Principal Investigator 1997–2000); Theodore Kopp, MS (1997–1999); Laurie Silfies (1997–2001). University of Washington, Seattle, WA: Joshua Benditt, MD (Principal Investigator), Douglas Wood, MD (Co-Principal Investigator); Margaret Snyder, MN (Principal Clinic Coordinator); Kymberley Anable; Nancy Battaglia; Louie Boitano; Andrew Bowdle, MD; Leighton Chan, MD; Cindy Chwalik; Bruce Culver, MD; Thurman Gillespy, MD; David Godwin, MD; Jeanne Hoffman; Andra Ibrahim, MD; Diane Lockhart; Stephen Marglin, MD; Kenneth Martay, MD; Patricia McDowell; Donald Oxorn, MD; Liz Roessler; Michelle Toshima; Susan Golden (1998-2000). Other participants: Agency for Healthcare Research and Quality, Rockville, MD: Lynn Bosco, MD, MPH; Yen-Pin Chiang, PhD; Carolyn Clancy, MD; Harry Handelsman, DO. Centers for Medicare and Medicaid Services, Baltimore, MD: Steven M Berkowitz, PhD; Tanisha Carino, PhD; Joe Chin, MD; JoAnna Baldwin; Karen McVeary; Anthony Norris; Sarah Shirey; Claudette Sikora; Steven Sheingold, PhD (1997–2004). Coordinating Center, The Johns Hopkins University, Baltimore, MD: Steven Piantadosi, MD, PhD (Principal Investigator); James Tonascia, PhD (Co-Principal Investigator); Patricia Belt; Amanda Blackford, ScM; Karen Collins; Betty

Collison; Ryan Colvin, MPH; John Dodge; Michele Donithan, MHS; Vera Edmonds; Gregory L. Foster, MA; Julie Fuller; Judith Harle; Rosetta Jackson; Shing Lee, ScM; Charlene Levine; Hope Livingston; Jill Meinert; Jennifer Meyers; Deborah Nowakowski; Kapreena Owens; Shangqian Qi, MD; Michael Smith; Brett Simon, MD; Paul Smith; Alice Sternberg, ScM; Mark Van Natta, MHS; Laura Wilson, ScM; Robert Wise, MD. Cost Effectiveness Subcommittee: Robert M. Kaplan, PhD (Chair); J. Sanford Schwartz, MD (Co-Chair); Yen-Pin Chiang, PhD; Marianne C. Fahs, PhD; A. Mark Fendrick, MD; Alan J. Moskowitz, MD; Dev Pathak, PhD; Scott Ramsey, MD, PhD; Steven Sheingold, PhD; A. Laurie Shroyer, PhD; Judith Wagner, PhD; Roger Yusen, MD. Cost Effectiveness Data Center, Fred Hutchinson Cancer Research Center, Seattle, WA: Scott Ramsey, MD, PhD (Principal Investigator); Ruth Etzioni, PhD; Sean Sullivan, PhD; Douglas Wood, MD; Thomas Schroeder, MA; Karma Kreizenbeck; Kristin Berry, MS; Nadia Howlader, MS. CT Scan Image Storage and Analysis Center, University of Iowa, Iowa City, IA: Eric Hoffman, PhD (Principal Investigator); Janice Cook-Granroth, BS; Angela Delsing, RT; Junfeng Guo, PhD; Geoffrey McLennan, MD; Brian Mullan, MD; Chris Piker, BS; Joseph Reinhardt, PhD; Blake Wood; Jered Sieren, RTR; William Stanford, MD. Data and Safety Monitoring Board: John A. Waldhausen, MD (Chair); Gordon Bernard, MD; David DeMets, PhD; Mark Ferguson, MD; Eddie Hoover, MD; Robert Levine, MD; Donald Mahler, MD; A. John McSweeney, PhD; Jeanine Wiener-Kronish, MD; O. Dale Williams, PhD; Magdy Younes, MD. Marketing Center, Temple University, Philadelphia, PA: Gerard Criner, MD (Principal Investigator); Charles Soltoff, MBA. Project Office, National Heart, Lung, and Blood Institute, Bethesda, MD: Gail Weinmann, MD (Project Officer); Joanne Deshler (Contracting Officer); Dean Follmann, PhD; James Kiley, PhD; Margaret Wu, PhD (1996-2001).